



# MASSACHUSETTS WATER RESOURCES AUTHORITY

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Mr. Stephen Perkins, Director  
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US EPA, Region 1  
5 Post Office Square, Suite 100  
Boston, MA 02109-3912

August 23, 2013

Ms. Ann Lowery  
Bureau of Resource Protection  
Department of Environmental Protection  
1 Winter Street  
Boston, MA 02108

**RE: Massachusetts Water Resources Authority NPDES Permit Number MA0103284 – MWRA  
Annual Infiltration and Inflow (I/I) Reduction Report for Fiscal Year 2013**

Dear Mr. Perkins and Ms. Lowery:

In compliance with the requirements of MWRA's NPDES Permit MA0103284 - Part I, Item 18.bb (ii) "Infiltration/Inflow" (page 28 of 32), the Authority submits this cover letter and the six Attachments listed below that together comprise the MWRA Annual Infiltration and Inflow (I/I) Reduction Report for Fiscal Year 2013.

- Attachment 1 – Overview of MWRA Regional I/I Reduction Plan
- Attachment 2 – MWRA Regional I/I Reduction Plan – FY13 Progress Update and Detailed Implementation Schedule for FY14 Activities
- Attachment 3 – MWRA Actions Taken to Reduce I/I During FY13
- Attachment 4 – Status Update on MWRA's I/I Local Financial Assistance Program
- Attachment 5 – I/I Reduction Status Update for Member Communities
- Attachment 6 – CY12 Community Wastewater Flow Data

Should you require additional information, please contact Carl H. Leone, Senior Program Manager, Community Support Program at (617) 788-4356.

Sincerely,

Michael J. Hornbrook  
Chief Operating Officer

cc: MassDEP-Regulatory Branch, Boston  
MassDEP - SERO  
MassDEP – NERO  
Kevin Brander, MassDEP, NERO

Grace Bigornia-Vitale, MWRA, NPDES Coordinator  
Carl H. Leone, MWRA, Community Support Program

ATTACHMENT 1  
TO  
MWRA ANNUAL I/I REDUCTION REPORT FOR FY13  
Reporting Period – July 2012 Through June 2013

## OVERVIEW OF MWRA REGIONAL I/I REDUCTION PLAN

The MWRA Board of Directors approved the Regional Infiltration/Inflow (I/I) Reduction Plan on May 23, 2001 and authorized staff to submit the Plan to EPA and DEP as required under MWRA's NPDES Permit. The plan was submitted to EPA and DEP in June 2001 and DEP approved the plan in a letter dated November 19, 2002. A full copy of the Regional I/I Reduction Plan (dated September 2002) was included as Attachment 2 to the August 29, 2003 MWRA Annual I/I Reduction Report for FY03. The Regional I/I Reduction Plan is available at <http://www.mwra.com/comsupport/communitysupportmain.html>.

The Regional I/I Reduction Plan combines recommendations from the I/I Task Force Report (March 2001) with ongoing MWRA I/I reduction initiatives. The updated plan replaces the Authority's 1990 I/I Reduction Policy. Implementation of the Regional I/I Reduction Plan focuses on the cooperative efforts of member communities, DEP, EPA and MWRA to develop and implement I/I reduction and sewer system rehabilitation projects.

Under the plan, MWRA has full legal and fiscal responsibility for implementation of operation, maintenance, and I/I reduction programs for the MWRA-owned interceptor system. Each member community retains full legal and fiscal responsibility for implementation of operation, maintenance and I/I reduction programs for community-owned sewers. MWRA will provide technical and financial assistance to member communities and work cooperatively with DEP, EPA and other stakeholders to help solve local and regional sewer problems. MWRA's Regional I/I Reduction Plan is organized into five major goals:

1. MWRA will continue its current operation and maintenance program for the MWRA-owned interceptor system leading to the identification, prioritization and rehabilitation of structural and I/I problems.
2. MWRA will work cooperatively with member communities, DEP and EPA to eliminate sewer system backups into homes and other buildings and to minimize health and environmental impacts of SSOs related to I/I.
3. MWRA will work cooperatively with member communities, DEP and EPA to reduce I/I in the regional collection system with emphasis on the following: (1) inflow reduction in areas tributary to sewer backups and SSOs, (2) private source inflow reduction, (3) infiltration that may impact groundwater or surface water resources, and (4) excessive infiltration as defined in DEP regulations or guidance documents.
4. MWRA will work cooperatively with member communities, DEP and EPA to expand existing efforts to educate and involve the public regarding regional sewer backup, SSO and I/I reduction issues.
5. MWRA will provide technical assistance and work cooperatively with member communities, DEP and EPA regarding guidance on local operation and maintenance and capital improvement programs intended to provide a reasonable level of sewer service to local sewer users/ratepayers.

ATTACHMENT 2  
TO  
MWRA ANNUAL I/I REDUCTION REPORT FOR FY13  
Reporting Period – July 2012 Through June 2013

**MWRA REGIONAL I/I REDUCTION PLAN -  
FY13 PROGRESS UPDATE AND DETAILED  
IMPLEMENTATION SCHEDULE FOR FY14 ACTIVITIES**

This document provides a progress update for FY13 accomplishments and a description of the activities to be accomplished during FY14 for each of the I/I reduction strategies in the MWRA Regional I/I Reduction Plan. The update appears in bold type directly below each I/I reduction strategy. This document is intended to satisfy condition 5 of DEP's November 19, 2002 letter approving the MWRA Regional I/I Reduction Plan.

Goal 1 under MWRA's Regional I/I Reduction Plan is:

*MWRA will continue its current operation and maintenance program for the MWRA-owned interceptor system leading to the identification, prioritization, and rehabilitation of structural and I/I problems.*

*Strategy A:* Utilize MWRA's internal TV inspection equipment that currently includes one fully outfitted internal TV inspection vehicles equipped with 6000 feet of multi-conductor cable. MWRA also utilizes an OZ-camera that has a 200X zoom capability. Annual inspection schedules are outlined in MWRA's Collection System O&M Manual. This strategy has an ongoing schedule that has been initiated.

*Strategy B:* Utilize MWRA's sonar camera to inspect siphons and force mains. Annual inspection schedules are outlined in MWRA's Collection System O&M Manual. This strategy has an ongoing schedule that has been initiated.

*Strategy C:* Physical inspection of collection system manholes and structures by Operations Division field crews. Annual inspection schedules are outlined in MWRA's Collection System O&M Manual. This strategy has an ongoing schedule that has been initiated.

**Work by MWRA under these three Strategies is ongoing.**

**During FY13, MWRA properly operated and maintained the MWRA-owned interceptor system. Annual performance targets and ongoing accomplishments are tracked as part of the Authority's MAXIMO maintenance database and are reported monthly to MWRA senior management. Specific activities undertaken by MWRA for FY13 are detailed in Attachment 3. Additional information on MWRA's FY13 maintenance activities is provided under separate submittal - NPDES Part I.18.g Annual Maintenance Status Sheets.**

**During FY14, MWRA will continue to properly operate and maintain the MWRA-owned interceptor system.**

Goal 2 under MWRA's Regional I/I Reduction Plan is:

*MWRA will work cooperatively with member communities, DEP, and EPA to eliminate sewer system backups into homes and other buildings and to minimize health and environmental impacts of SSOs related to I/I.*

*Strategy A:* MWRA will provide technical assistance to DEP to develop a uniform format for use by communities for reporting wastewater backup and sewer system overflow information. A representative group of communities should be consulted for review. MWRA will provide technical assistance to DEP to develop a system to record the information reported by communities into a usable database format. This database may have the capability to be linked to GIS mapping and the information may be made available to communities, MWRA, DEP, EPA, watershed groups, the general public, etc. upon appropriate request. This strategy has an ongoing schedule that should be initiated in the short-term. Completion of this strategy requires a significant resource commitment by DEP. Collection and recording of sewer backup and SSO information from member community sewer systems is the responsibility of DEP. DEP will be responsible for management of collection and distribution of these records. (Cross-reference this strategy to the I/I Task Force Report recommendations 4.1 Strategy A-2 and 5.2 Strategy B-2)

**Work by MWRA under this Strategy is complete as noted below.**

**During spring 2001 MWRA provided MassDEP a draft SSO reporting/record keeping electronic database format that was developed by Malcolm-Pirnie, Inc. under contract to MWRA. This work was completed by MWRA as technical assistance to MassDEP. A follow-up letter dated June 20, 2001 requested MassDEP identify the format for finalizing the SSO reporting/record keeping electronic database.**

**During FY04, MassDEP (in conjunction with staff in the Massachusetts Information Technology Division), developed a revised format SSO electronic database package. This project was part of statewide efforts to upgrade computerized resources and electronic access. The system was demonstrated at an April 8, 2004 MassDEP/MWRA joint community workshop. Development/implementation by MassDEP was expected to continue in through FY05.**

**In May 2005, MassDEP developed a revised Reporting Form "Sanitary Sewer Overflow/Bypass/Backup Notification Form (rev 05/2005)." This form was made available on the MassDEP web site and reporting was via FAX or by mail. Following development of the web based reporting form by MassDEP, roll-out of the SSO reporting/record keeping electronic database was delayed. In January 2013, MassDEP developed the most recent revised Reporting Form "Sanitary Sewer Overflow (SSO)/Bypass Notification Form (rev 01/2013)." As of July 2013, this form is available on the MassDEP web site and reporting using the form is via FAX or by mail. As of July 2013, an SSO reporting/record keeping electronic database is not included among the searchable databases available on the MassDEP web site.**

**As requested by MassDEP, on August 22, 2011 MWRA provided MassDEP specific SSO site location information for SSO's on MWRA-owned northern system sewers (for events during the period January 2000 through June 2011), including street location, longitude and latitude location, and GIS site maps.**

*Strategy B:* Once a central information database is established (see Strategy A), MWRA will periodically delineate areas which may be “at risk” for backups and SSOs that may be impacted by the MWRA-owned collection system. MWRA will evaluate potential improvements to the MWRA-owned collection system that may reduce the risk of sewer backups and SSOs. This strategy should be completed in the mid to long-term. (Cross-reference this strategy to the I/I Task Force Report recommendations 4.3 Strategy C-2 and 5.5 Strategy E-2)

**Work by MWRA under this Strategy is complete as noted below. Some ongoing work performed by MWRA that is associated with this Strategy is also noted.**

**MWRA utilizes MassDEP’s Sanitary Sewer Overflow (SSO)/Bypass Notification Form (rev 01/2013) to report SSOs from MWRA’s collection system.**

**MWRA does not have SSOs related to dry weather sewer system capacity issues. MWRA does not have SSOs related to wet weather sewer capacity issues for rainfall events at or below the MassDEP recommended design storm having a one year recurrence interval and a duration of six hours (see MassDEP’s Guidelines for Performing I/I Analyses and Sewer System Evaluation Surveys – Revised January 1993). The one-year, six-hour storm produces approximately 1.72 inches of rainfall in the Boston area. During extreme storm events that exceed the MassDEP recommended design storm, I/I entering the upstream community-owned collection systems may cause an occasional SSO in the MWRA regional interceptor system.**

**During FY13, MWRA continued its ongoing priority program to clean and inspect all inverted siphons in the MWRA-owned collection system. This program is intended to minimize potential SSOs upstream of siphons and reduce the risk of hydraulic limitations and/or blockage from debris buildup in siphon barrels. The cleaning and inspection program will continue in FY14.**

**In FY12-13, MWRA began implementing the North System Hydraulic Study which may further evaluate potential improvements to the MWRA-owned collection system that may reduce the risk of sewer backups and SSOs.**

*Strategy C:* Once a central information database is established (see Strategy A) and member communities have delineated areas which may be “at risk” for backups and SSOs, MWRA - jointly with DEP - will provide technical assistance to member communities to evaluate potential improvements to local infrastructure that may reduce the risk of sewer backups and SSOs. MWRA will assist communities to determine if impacts from the regional collection system are an issue. The schedule for this strategy is dependent on prior actions by DEP and member communities. (Cross-reference this strategy to the I/I Task Force Report recommendations 4.3 Strategy C-1 and 5.5 Strategy E-1)

**MWRA’s work on this strategy is awaiting follow-up by MassDEP on roll-out of the SSO reporting/record keeping electronic database (see Strategy A above). Some ongoing work performed by MWRA that is associated with this Strategy is noted below.**

**As part of its ongoing program to support member community I/I reduction and sewer system rehabilitation programs, MWRA offers technical assistance to communities to review local I/I reduction plans and regional SSO problems. During FY14, at the request of member communities, MWRA will continue to provide technical assistance on local sewer system projects.**

*Strategy D:* For the MWRA-owned interceptor system, MWRA will review and analyze the health and environmental impacts of existing SSO sites. SSO sites will be prioritized based on the frequency and duration of activations and the resulting health and environmental impacts, including: potential for human contact, impact to water supply, impact to shellfish beds or other economic resources, impact to animal or aquatic habitat, etc. This strategy will be completed in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 5.3 Strategy C-1)

**Work by MWRA under this Strategy is complete as noted below. Some ongoing work performed by MWRA that is associated with this Strategy is also noted.**

**As previously stated, MWRA does not have SSOs related to dry weather sewer system capacity issues. MWRA also does not have SSOs related to wet weather sewer capacity issues for rainfall events at or below the MassDEP recommended design storm having a one year recurrence interval and a duration of six hours (see MassDEP's Guidelines for Performing I/I Analyses and Sewer System Evaluation Surveys – Revised January 1993). Since prior SSOs have been eliminated for sewer capacity issues at or below the collection system design standard, additional work under this strategy is not necessary.**

**In FY12-13, MWRA began implementing the North System Hydraulic Study which may further evaluate potential improvements to the MWRA-owned collection system that may reduce the risk of sewer backups and SSOs.**

*Strategy E:* Utilizing the priority ranking to be completed in Strategy D above, as well as system hydraulic analyses, MWRA (for the MWRA-owned interceptor system) - in conjunction with DEP and EPA - will evaluate the potential to eliminate each overflow. Appropriate I/I reduction and/or relief sewer projects that may eliminate (or minimize) SSOs from MWRA-owned interceptors will be evaluated. This strategy will be initiated in the short to mid-term; however, implementation of projects developed from the evaluation may span beyond the long-term time frame as defined within the Regional I/I Reduction Plan. (Cross-reference this strategy to the I/I Task Force Report recommendation 5.3 Strategy C-2)

**Work by MWRA under this Strategy is complete as noted below. Some ongoing work performed by MWRA that is associated with this Strategy is also noted.**

**As previously stated, MWRA does not have SSOs related to dry weather sewer system capacity issues. MWRA also does not have SSOs related to wet weather sewer capacity issues for rainfall events at or below the MassDEP recommended design storm having a one year recurrence interval and a duration of six hours (see MassDEP's Guidelines for Performing I/I Analyses and Sewer System Evaluation Surveys – Revised January 1993). Since prior SSOs have been eliminated for sewer capacity issues at or below the collection system design standard, additional work under this strategy is not necessary.**

**During FY13, as part of its ongoing program to support member community I/I reduction and sewer system rehabilitation programs, MWRA offered technical assistance to communities to review local I/I reduction plans and regional SSO problems. MWRA also continued to provide financial assistance to reduce I/I entering local collection systems to help minimize SSOs that may occur during extreme storm events (see detail in Attachment 4).**

**During FY13, MWRA continued work on projects in the MWRA Capital Improvement Program, as summarized in Attachment 3.**

**During FY14, at the request of member communities, MWRA will continue to provide technical and financial assistance to member sewer communities. In FY12-13, MWRA began implementing the North System Hydraulic Study which may further evaluate potential improvements to the MWRA-owned collection system that may reduce the risk of sewer backups and SSOs.**

*Strategy F:* For those overflows that are unlikely to be eliminated in the short to mid-term (based on the evaluation from Strategy E, above), MWRA (for the MWRA-owned interceptor system) will consider developing interim measures to relocate or otherwise mitigate the impact of existing overflows on human and natural resources. The priority ranking (from Strategy D, above) will be utilized in development of interim mitigation measures. This strategy has an ongoing schedule that should be initiated in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 5.3 Strategy C-3)

**Work by MWRA under this Strategy is ongoing.**

**As previously stated, MWRA does not have SSOs related to dry weather sewer system capacity issues. MWRA also does not have SSOs related to wet weather sewer capacity issues for rainfall events at or below the MassDEP recommended design storm having a one year recurrence interval and a duration of six hours (see MassDEP's Guidelines for Performing I/I Analyses and Sewer System Evaluation Surveys – Revised January 1993). The one-year, six-hour storm produces approximately 1.72 inches of rainfall in the Boston area.**

**During FY13, MWRA continued its ongoing priority program to clean and inspect all inverted siphons in the MWRA-owned collection system. This program is intended to minimize potential SSOs upstream of siphons and reduce the risk of hydraulic limitations and/or blockage from debris buildup in siphon barrels. The cleaning and inspection program will continue in FY14.**

**During extreme storm events that exceed the MassDEP recommended design storm, I/I entering the upstream community-owned collection systems may cause an occasional SSO in the MWRA regional interceptor system. The bullets below provide an update on I/I reduction and/or sewer projects that may eliminate (or minimize) SSOs related to extreme rainfall events and interim measures to relocate or otherwise mitigate the impact of SSOs related to extreme rainfall events.**

- **Continued coordination with member communities to reduce I/I from local collection systems will help to minimize SSOs that may occur during extreme storm events. Most recently during MWRA Board of Director's approval of the FY13**

**Capital Improvement Program, an additional \$40 million in 45% grants and 55% interest-free loans was added as Phase 8 of the I/I Local Financial Assistance Program to help fund community I/I reduction projects. MWRA's commitment for the I/I Local Financial Assistance Program totals \$300.75 million.**

- **Ongoing CSO projects in Cambridge and Somerville tributary to the Alewife Brook Conduit and the North Metropolitan Relief Sewer may reduce downstream SSOs that may occur during extreme storm events.**
- **If activated during an extreme rainfall event, MWRA's emergency directed discharge (via two gate valves) to the Stony Brook Conduit in Boston/Roslindale is intended to minimize potential SSO impacts within this local low lying area.**
- **In FY12-13, MWRA began implementing the North System Hydraulic Study which may further evaluate potential improvements to the MWRA-owned collection system that may reduce the risk of sewer backups and SSOs.**
- **MWRA's Capital Improvement Plan includes a long-term Randolph Extension Sewer Relief Study to identify and evaluate potential system improvements.**

*Strategy G:* MWRA will assist DEP, member communities, and other regional stakeholders to inform local plumbing inspectors of the regional priority of eliminating sewer system backups. Plumbing inspectors will be requested to work more closely with local DPW staff to identify sewer system backup problem areas and locations where backflow prevention devices may be required. MWRA expects to meet this strategy by distributing a letter to the plumbing inspector in each member community that discusses sewer backups, potential public health impacts, backflow prevention, and coordination with the local DPW to identify problem areas. This strategy will be completed in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 4.2 Strategy B-4)

**Work by MWRA under this Strategy is complete as noted below.**

**On September 26, 2005, MWRA distributed an informational package on Sewer Backups and Sanitary Sewer Overflows to all service area community plumbing inspectors, Health Departments (Boards of Health), DPW Directors, Engineering Departments, and collection system operators. The package included information from fourteen separate sources and provided many web links for additional information. On September 29, 2005, MWRA sent a copy of the informational package to EPA, MassDEP, all MWRA water-only member communities, and local watershed associations.**



Goal 3 under MWRA's Regional I/I Reduction Plan is:

*MWRA will work cooperatively with member communities, DEP, and EPA to reduce I/I in the regional collection system with emphasis on the following: (1) inflow reduction in areas tributary to sewer backups and SSOs, (2) private source inflow reduction, (3) infiltration that may impact groundwater or surface water resources, and (4) excessive infiltration as defined in DEP regulations or guidance documents.*

*Strategy A:* MWRA will continue to analyze available MWRA wastewater metering data to estimate community infiltration and inflow rates. MWRA will provide this information along with technical assistance to help interpret the information to member communities. This strategy has an ongoing schedule that has been initiated. (Cross-reference this strategy to the I/I Task Force Report recommendations 6.1 Strategy A-1, and 7.1 Strategy A-1).

**Work by MWRA under this Strategy is ongoing.**

**During FY13, MWRA continued to estimate community infiltration and inflow rates on a bimonthly basis. Community wastewater flow data for CY12 is included as Attachment 6. These flow data tables are available to all users on MWRA's web site. Community wastewater flow rate basis data is distributed to member communities throughout the year on a bimonthly basis. Over \$21 million in funds for the next phase of wastewater meter replacement/upgrade project are programmed in MWRA's Capital Improvement Program during FY14-28.**

**During FY14, MWRA will continue to estimate community infiltration and inflow rates on a bimonthly basis and make this information available to MWRA member communities. MWRA will provide the information to EPA and MassDEP as part of the annual summary report on actions taken to reduce I/I (submitted annually by September 1 per the NPDES Permit).**

*Strategy B:* MWRA, in cooperation with member communities, will evaluate the feasibility of developing and operating an expanded emergency notification system (ENS). Currently, the MWRA remotely monitors wastewater flow at key locations within the regional collection system before and during wet weather events. Interested communities are notified when sewer system depths reach critical levels. The Authority and member communities use this information to forecast problem areas, predict potential sewer system overflows and deploy work crews. The MWRA's wastewater metering system will be upgraded over the next few years. This upgrade may impact the ENS. MWRA is also investigating, over the next three to five years, the benefits of adding SCADA-type meters at some key locations in the collection system. After completion of the two ongoing projects, MWRA will evaluate whether an ENS system can be used efficiently to provide information at the local level. This strategy will be completed in the long-term or more extended time frame subject to the schedule of the ongoing projects noted above. (Cross-reference this strategy to the I/I Task Force Report recommendation 5.4 Strategy D-1)

**Work by MWRA under this Strategy is complete as noted below.**

**MWRA's Wastewater Meter Replacement project was completed in FY06. The system continues to be used to monitor wastewater flow at key locations within the regional collection system before and during wet weather events. Interested communities are notified when sewer system depths reach critical levels.**

*Strategy C:* MWRA will provide technical assistance to member communities to establish written infiltration and inflow identification and removal programs as outlined in the I/I Task Force Report. This strategy has an ongoing schedule that will be initiated in the short to mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendations 6.1 Strategy A-1, and 7.1 Strategy A-1)

**Work by MWRA under this Strategy is ongoing.**

**During FY13, MWRA staff continued to meet with community representatives to provide technical assistance and discuss local programs. Communities are often interested in utilizing MWRA wastewater meter data and flow component analyses for local I/I and Sewer System Evaluation Survey (SSES) studies. Communities also often discuss what sewer system rehabilitation actions other communities are pursuing. MWRA's Advisory Board Operation Committee meetings are regularly used as a platform for member communities to share information on projects and lessons learned. All member sewer communities are actively participating in MWRA's I/I Local Financial Assistance Program (see Attachment 4). Community I/I reduction programs are generally being conducted by local engineering consultants under contract to the communities. These projects generally utilize standards established in MassDEP's January 1993 I/I Guidelines. This work will continue in FY14.**

*Strategy D:* MWRA will provide technical assistance to member communities that seek to emphasize infiltration removal that may impact groundwater and surface water resource areas. MWRA will provide GIS mapping information to member communities that identifies water resource areas, provides an overlay of local and regional sewers, and delineates watersheds. The I/I Task Force Report recommends communities target areas where infiltration reduction will provide the most meaningful benefit for aquifer recharge, stream flow, wetlands and water levels in lakes and ponds. The Task Force also recommends communities coordinate their infiltration reduction efforts with appropriate EOEAs Watershed Teams, local watershed groups and the local conservation commission. Distribution of MWRA mapping information is intended to assist member communities in fulfilling this I/I Task Force recommendation. This strategy has an ongoing schedule that will be initiated in the short to mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 7.1 Strategy A-5)

**Work by MWRA under this Strategy is complete as noted below. Some ongoing work performed by MWRA that is associated with this Strategy is also noted. Additional community technical assistance is provided upon request as noted under Strategy C, above.**

**During FY05, MWRA completed a major upgrade to its electronic sewer database and GIS mapping system. Also during FY05, MWRA completed coordination with local communities to more accurately map connection points of local sewers to the MWRA interceptor system and GPS located all wastewater meter sites located in community-owned sewers. Significant GIS mapping upgrades were rolled-out in FY06. MWRA**

**continues to upgrade its GIS mapping information and coordinate (partner) with member communities to share MWRA/community GIS mapping data.**

**In July 2006, MWRA provided GIS maps with detailed water resource information overlaid with the local sewer system to each MWRA member sewer community. In addition, land use mapping was also distributed to the communities. The distribution of this GIS mapping information fulfilled MWRA's work under Strategy D.**

**Also in 2006, a project to develop GIS partnership agreements with member communities was initiated. Based on the initial work, many of MWRA's member communities have agreed to GIS partner with MWRA and have signed nondisclosure agreements that detail security protocols necessary to safeguard the water and sewer system data. MWRA continues to coordinate with member communities to add GIS partners and update existing data. This work will continue in FY14.**

*Strategy E:* MWRA, in coordination with the MWRA Advisory Board, will continue to fund the I/I Local Financial Assistance Program to provide grants and loans to member sewer communities to fund local I/I reduction projects. Through September 2002, MWRA has authorized a total budget of \$140.75 million to fund this program. Financial assistance is provided through 45 percent grants and 55 percent interest-free loans for eligible projects. The MWRA Board of Directors has approved the program through FY2010. The I/I Local Financial Assistance Program is fully detailed in the "Program Guidelines" document available from the MWRA Community Support Program. This strategy has an ongoing schedule that has been initiated. (Cross-reference this strategy to the I/I Task Force Report recommendation 10.2 Strategy B-1)

**Work by MWRA under this Strategy is ongoing.**

**In June 2004, the MWRA Board of Directors approved an additional \$40 million (\$18 million in grants and \$22 million in interest-free loans) to increase the total I/I Local Financial Assistance Program budget to \$180.75 million and extended program distribution through FY13. The additional \$40 million (Phase 5) in financial assistance funds became available to the communities in FY05.**

**In June 2006, the MWRA Board of Directors approved an additional \$40 million (\$18 million in grants and \$22 million in interest-free loans) to increase the total I/I Local Financial Assistance Program budget to \$220.75 million and extended program distributions through FY15. The additional \$40 million (Phase 6) in financial assistance funds became available to the communities in FY07.**

**In June 2009, the MWRA Board of Directors approved an additional \$40 million (\$18 million in grants and \$22 million in interest-free loans) to increase the total I/I Local Financial Assistance Program budget to \$260.75 million and extended program distributions through FY18. The additional \$40 million (Phase 7) in financial assistance funds became available to the communities in FY10.**

**In June 2012, the MWRA Board of Directors approved an additional \$40 million (\$18 million in grants and \$22 million in interest-free loans) to increase the total I/I Local Financial Assistance Program budget to \$300.75 million and extended program**

**distributions through FY21. The additional \$40 million (Phase 8) in financial assistance funds became available to the communities in FY13.**

**During FY13, MWRA continued to provide grants and loans to member sewer communities to fund local I/I reduction and sewer system rehabilitation projects. A total of \$27.5 million was distributed during FY13. Since program inception in May 1993, \$248.5 million has been distributed to fund 444 local projects. The program Guidelines, Financial Assistance Application, and summary of available funds by community are posted on the MWRA Community Support Program web page at <http://www.mwra.com/comsupport/communitysupportmain.html>. A status update on MWRA's I/I Local Financial Assistance Program is included as Attachment 4.**

**During FY14, MWRA will continue to distribute funds and assist communities in the management of projects under the I/I Local Financial Assistance Program. MWRA's remaining financial assistance funds are authorized for distribution through FY21.**

*Strategy F:* MWRA, in coordination with the MWRA Advisory Board, will continue to provide emergency assistance to member communities for sewer services on local collection systems that are routinely performed by MWRA staff for the MWRA-owned interceptor system. Examples of past community assistance provided by MWRA staff include: emergency response assistance, bypass pumping, internal TV inspection, sewer cleaning, flow metering, engineering technical assistance, etc. This strategy has an ongoing schedule that has been initiated. (Cross-reference this strategy to the I/I Task Force Report recommendations 9.6 Strategy F-2, and 10.2 Strategy B-2)

**Work by MWRA under this Strategy is ongoing.**

**During FY13, MWRA continued to provide emergency assistance to member communities, as requested. These efforts included internal TV inspection of 2.0 miles of local sewers and associated sewer cleaning, as well as, other emergency assistance. During FY14, MWRA will continue to provide emergency assistance to member communities.**

Goal 4 under MWRA's Regional I/I Reduction Plan is:

*MWRA will work cooperatively with member communities, DEP, and EPA to expand existing efforts to educate and involve the public regarding regional sewer backup, SSO, and I/I reduction issues.*

*Strategy A:* MWRA will act as a "clearinghouse" to collect and distribute information on I/I and SSO issues. Other groups, agencies, associations, community representatives, and local citizens wishing to disseminate information on I/I and SSO issues within the region can provide a copy to MWRA that will be copied and distributed. MWRA staff will maintain a database of contacts with Federal, State and community officials, as well as, local associations and individuals that wish to stay informed on I/I and SSO issues. Summary mailings will be made periodically. MWRA, in coordination with the MWRA Advisory Board, will also act as a clearinghouse to inform regional stakeholders about the progress of efforts to increase state and federal funding for I/I reduction and SSO projects. Regional stakeholders will be advised on the most appropriate time to provide input and lobbying efforts. This strategy has an ongoing schedule that will be initiated in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendations 8.1 Strategy A-1, 10.4 Strategy C-5, and 10.4 Strategy D-2)

**Work by MWRA under this Strategy is ongoing.**

**During FY13, MWRA distributed technical information to member community Public Works Directors, local wastewater/water system operators, and local watershed groups, including:**

- 1. During FY13, MWRA continued to estimate community infiltration and inflow rates on a bimonthly basis. Community wastewater flow data for CY12 is included as Attachment 6. These flow data tables are available to all users on MWRA's web site. Community wastewater flow rate basis data is distributed to member communities throughout the year on a bimonthly basis. Over \$21 million in funds for the next phase of wastewater meter replacement/upgrade project are programmed in MWRA's Capital Improvement Program during FY14-28.**
- 2. July 18, 2012 announcement e-mails and follow-up letters on the MWRA Board of Directors approval of an additional \$40 million for Phase 8 of the I/I Local Financial Program and allocation of funds to each member community.**
- 3. October 5, 2012 Local Pipeline and Water System Assistance Program funding (interest-free 10-year loans) update for local water projects.**
- 4. November 2, 2012 MWRA staff provided an update presentation to the MWRA Advisory Board and member community representatives on MWRA wastewater metering methodologies.**
- 5. December 7, 2012 Local Pipeline and Water System Assistance Program funding (interest-free 10-year loans) update for local water projects.**

6. **February 15, 2013 follow-up second announcement letter on water conservation educational materials and low-flow device retrofit kits available from MWRA at no cost to member communities, local customers, watershed associations, environmental groups, housing authorities, condo associations, etc.**
7. **March 1, 2013 I/I Local Financial Assistance Program (45% grants and 55% interest-free 5-year loans) funding update for local sewer projects.**
8. **March 4, 2013 Local Pipeline and Water System Assistance Program funding (interest-free 10-year loans) update for local water projects.**
9. **March 21, 2013 MWRA staff provided an update presentation to the MWRA Advisory Board and member community representatives on proposed DEP regulation changes.**
10. **May 1, 2013 Technical Information Distribution on leak detection, pipeline rehabilitation, water storage tank rehabilitation, metering, and meter reading.**
11. **June 13, 2013 annual community I/I questionnaire distributed to develop information on FY13 local I/I reduction programs to for development of MWRA's Annual I/I Reduction Report.**
12. **June 20, 2013 MWRA staff provided an update presentation to the MWRA Advisory Board and member community representatives on Impacts of Co-Permittee Requirements to Communities.**

**During FY14, MWRA will continue to distribute information on I/I and SSO issues, as appropriate.**

*Strategy B:* MWRA will develop and distribute a summary of previous information/technology distributions regarding I/I reduction and SSOs. The summary will be organized by topic and distributed to all regional stakeholders in MWRA's database of contacts. This summary can be used as a tool to help reference previously distributed information. This strategy will be completed in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 8.1 Strategy A-2)

**Work by MWRA under this Strategy is complete as noted below.**

**On August 8, 2007, MWRA distributed a Technical Transfer Summary package that included lists of previously distributed information under five separate topic headings: (1) Reports, Handbooks, and Guidelines; (2) Sewer Back-ups, SSOs, and Flooding; (3) Public Source I/I Reduction; (4) Private Source I/I Reduction; and (5) Brochures and Bill Stuffers. Additional information/technology distributions will continue under Strategy A, above.**

*Strategy C:* MWRA, jointly with DEP (and possibly other regional organizations), will organize periodic demonstration projects and/or workshops to bring together regulators, community representatives, vendors, environmental groups, consultants, contractors, etc. Workshops may cover topics such as: new or revised regulations, I/I reduction technologies, updates/progress on Task Force Report recommendations, etc. MWRA and DEP conducted a joint workshop on private source inflow reduction during November 2001. Lessons learned from this workshop will help shape future efforts under this strategy. Completion of this strategy requires a significant resource commitment by DEP. This strategy has an ongoing schedule that will be initiated in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendations 8.1 Strategy A-3 and 8.2 Strategy B-6)

**Work by MWRA under this Strategy is ongoing. Following-up on the joint workshop in 2001, additional joint workshops were held in 2002 and 2004.**

**On April 27, 2011, representatives from MassDEP, EPA, and MWRA met to discuss I/I reduction in the region. The potential for future workshops was noted, but no specific plans have been developed for organizing additional joint workshops. During FY14, MWRA will continue to work cooperatively with MassDEP on this strategy.**

**On an annual basis, MWRA staff provided an update presentation to the MWRA Board of Directors on both I/I Local Financial Assistance and Local Water System Assistance Programs.**

**Periodically, MWRA staff provided update presentations to the MWRA Advisory Board and member community representatives, as well as the Wastewater Advisory Committee, on a variety of related topics including: I/I Local Financial Assistance Program, Local Water System Assistance Program, water and wastewater metering, water and wastewater flow data, rate assessment methodologies, water and wastewater permitting and regulations, etc.**

*Strategy D:* MWRA will develop a summary of available public education material such as local/regional billing inserts, Water Environment Federation (WEF) brochures, “How-To” pamphlets, etc. The summary will provide information on where to obtain the material. A listing of available public education materials will be posted on the MWRA Internet site. MWRA will also make copies of public education material available to communities and local associations. MWRA will pilot this strategy by distributing to member communities sample copies of the “Fat-Free Sewers” brochure developed cooperatively by the Water Environment Federation (WEF) and EPA. MWRA will recommend use of the brochures for public education. This strategy has an ongoing schedule that will be initiated in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendations 8.2 Strategy B-1, and 8.2 Strategy B-4)

**Work by MWRA under this Strategy is complete as noted below.**

**MWRA distributed the Fat-Free Sewers brochure to wastewater system operators in July 2003. In conjunction with the Technical Transfer Summary package distributed on August 8, 2007 (see Strategy B, above), MWRA included a separate topic heading for “Brochures and Bill Stuffers” that can be used by local communities as educational materials.**

*Strategy E:* Depending on the outcome of the summary of available information being developed under Strategy D, MWRA (jointly with DEP, and possibly other regional organizations) may develop informational materials that will educate the public on I/I and SSO issues. This effort may include “how-to” pamphlets that detail a step-by-step process for disconnecting private inflow sources or similar information. The development of new materials under this strategy will be targeted to fill gaps that are not covered by existing/available public education material. This strategy will be completed in the mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 8.2 Strategy B-2)

**Work by MWRA under this Strategy is complete as noted below.**

**As part of the Technical Transfer Summary package distributed on August 8, 2007 (see Strategy B, above), MWRA included a separate topic heading specifically for “Brochures and Bill Stuffers” that can be used by local communities as educational materials. There are sufficient example brochures available so that no additional work is needed under this strategy. Communities actively involved with private inflow removal programs have generally been using available sample brochures and other public education materials to develop public education information related to their specific project. Information already available via local engineering consultants is also utilized.**

*Strategy F:* Upon request from member communities, MWRA will assist member communities in providing a link from the local DPW or community Internet site to the MWRA Internet site. The possibility of a link or reference to other regional bodies that are involved in sewer system issues (such as DEP, EPA, New England Water Environment Association, New England Interstate Water Pollution Control Commission, watershed associations, etc) will also be investigated. This strategy will be completed in the mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 8.2 Strategy B-3)

**Work by MWRA under this Strategy is complete as noted below.**

**Local communities, state agencies, regional associations, etc. all maintain their own web pages with numerous information links. MWRA’s web site contains links to the communities’ web sites and links to other organizations. Based on current broad use of the web, additional work under this strategy is not needed. During FY13, MWRA continued to revise and upgraded its web site [www.mwra.com](http://www.mwra.com) and the Community Support Program: <http://www.mwra.com/comsupport/communitysupportmain.html>.**



*Strategy G:* MWRA will integrate information on I/I and SSO issues into existing MWRA school education materials. MWRA's School Education staff will identify what types of materials are appropriate for their programs. This strategy has an ongoing schedule that will be initiated in the mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 8.3 Strategy C-1)

**Work by MWRA under this Strategy is ongoing.**

**The focus of MWRA's School Education Program is to provide a general understanding of water and wastewater transport and treatment systems with emphasis on water conservation and environmental awareness issues. Educational materials are designed for students from elementary to high school levels.**

*Strategy H:* Upon request from DEP, MWRA will provide technical assistance to DEP to develop and issue DEP press releases prior to and during extreme wet weather events to notify the public of possible sewer system backups and overflow problems. The I/I Task Force Report recommends DEP develop a standardized format that includes a request that system users minimize non-essential water consumption activities and includes a standardized high sewer flow warning. Completion of this strategy is dependent on DEP actions. This strategy has an ongoing schedule that should be initiated in the short to mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 5.4 Strategy D-2)

**Work by MWRA under this Strategy is ongoing. During FY13, no assistance from MWRA was requested by MassDEP. Any future action under this strategy will be initiated jointly with MassDEP.**

*Strategy I:* Upon request from member communities, MWRA will provide technical assistance to communities to provide residents with information on I/I reduction, SSOs and backups using local cable stations or other media outlets. This strategy has an ongoing schedule that will be initiated in the mid to long-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 8.2 Strategy B-7)

**Work by MWRA under this Strategy is ongoing. During FY13, no assistance from MWRA was requested under this strategy.**

Goal 5 under MWRA's Regional I/I Reduction Plan is:

*MWRA will provide technical assistance and work cooperatively with member communities, DEP, and EPA regarding guidance on local operation and maintenance and capital improvement programs intended to provide a reasonable level of sewer service to local sewer users/ratepayers.*

*Strategy A:* MWRA will provide all member communities a copy of the I/I Task Force Report (which includes recommendations for sewer system operation and maintenance). MWRA will maintain a supply of I/I Task Force Reports and will provide additional copies to MWRA member communities and regional stakeholders, as requested. This strategy has an ongoing schedule that has been initiated.

**Work by MWRA under this Strategy is complete as noted below.**

**MWRA provided all member communities and all interested parties copies of the I/I Task Force Report in April 2001, shortly after the Report was completed. MWRA continues to maintain a supply of I/I Task Force Reports and provides additional copies to MWRA member communities and regional stakeholders, as requested. In July 2003, all member communities were provided a copy of the MWRA Regional I/I Reduction Plan. Both the I/I Task Force Report and MWRA Regional I/I Reduction plan are posted on MWRA's Community Support Program web page at: <http://www.mwra.com/comsupport/communitysupportmain.html>.**

*Strategy B:* MWRA will request member communities provide a copy of their existing local Sewer Use Regulations to MWRA, will review those local Regulations that are submitted, and will make recommendations for improvements. MWRA may utilize a committee representing a cross-section of sewer system stakeholders to assist in accomplishing this strategy. This strategy will be completed in the mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 9.1 Strategy A-2)

**Work by MWRA under this Strategy is complete as noted below.**

**MWRA did not proceed with work under this strategy pending issuance of EPA's SSO Rule, including CMOM Regulations, that were likely to impact local sewer use regulations. EPA's draft SSO Rule was not promulgated. During FY04, MassDEP distributed a new guideline document – "Optimizing Operation, Maintenance and Rehabilitation of Sanitary Sewer Collection Systems" dated August 2003. This manual was developed by New England Interstate Water Pollution Control Commission (NEIWPCC) under a grant from EPA. The Guideline Document was written by a committee consisting of NEIWPCC member state environmental agencies, EPA, and wastewater consultants. The manual is available at [www.neiwpcc.org](http://www.neiwpcc.org). Chapter 4 of the manual "Optimizing Legal Authority" includes sections on Sewer Use Ordinances; therefore, additional work by MWRA under this strategy is not necessary.**

*Strategy C:* MWRA will develop a Member Community Collection System Operation and Maintenance Manual Guidance Document and Overflow Response Plan. This guidance document will be provided to all member communities. This strategy will be completed in the short-term.

**Work by MWRA under this Strategy is complete as noted below.**

**A Member Community Collection System Operation and Maintenance Manual Guidance Document and Overflow Response Plan was developed and submitted to EPA and MassDEP for review in June 2001. This guidance document was made available to member communities. During FY04, MassDEP distributed a new guideline document – “Optimizing Operation, Maintenance and Rehabilitation of Sanitary Sewer Collection Systems” dated August 2003. This manual was developed by New England Interstate Water Pollution Control Commission (NEIWPCC) under a grant from EPA. It was written by a committee consisting of NEIWPCC member state environmental agencies, EPA, and wastewater consultants. The manual is available at [www.neiwpcc.org](http://www.neiwpcc.org). MWRA provided its collection system O&M manual and the community collection system guidance document to the NEIWPCC committee for review. With the publication of the NEIWPCC manual, further efforts on the Member Community Collection System Operation and Maintenance Manual Guidance Document are not required.**

ATTACHMENT 3  
TO  
MWRA ANNUAL I/I REDUCTION REPORT FOR FY13  
Reporting Period – July 2012 Through June 2013

## MWRA ACTIONS TAKEN TO REDUCE I/I DURING FY13

The MWRA Field Operations Department's Technical Inspection program staff have internally inspected approximately 32.3 miles of Authority-owned interceptors and 2.0 miles of community-owned sewers, internally inspected 49 inverted siphon barrels with sonar inspection equipment, and physically inspected 1168 sewer manholes and other structures (diversion chambers, siphon headhouses, tide gates, etc.) during FY13. During the internal inspection process, problems such as physical defects, infiltration, sediment, grease deposits, etc. are noted and stored in MWRA's electronic maintenance (MAXIMO) database. Maintenance work is then scheduled based on the identified problems. During FY13, maintenance work included hydraulic/mechanical cleaning of 28.7 miles of Authority-owned sewers, cleaning of 75 siphon barrels, replacement of 132 manhole frames and covers, and rehabilitation of 40 sewer manholes. Potential structural problems and infiltration sources identified during the inspection process are referred to engineering staff for follow-up review and analysis of cost-effective repairs.

The MWRA is undertaking a number of significant capital projects to provide additional hydraulic capacity and rehabilitate portions of Authority-owned interceptors. Updates on these projects are included below:

1. During FY13, MWRA continued rehabilitation of sewer interceptors under the Interceptor Renewal/Asset Protection Program. Evaluation and design of interceptor rehabilitation began in FY09. The program includes a series of twelve interceptor renewal projects to be phased over multiple years at a cost of \$80 to \$100 million. Each of these projects will provide structural repairs for existing pipelines and reduce I/I entering the MWRA interceptor system. MWRA's Interceptor Renewal/Asset Protection Projects #1 through #7 for rehabilitation construction of a variety of Sewer Sections are programmed in the FY14 CIP at a cost of about \$40 million in FY15-30.
2. Sewer asset protection rehabilitation construction of Section 186 and a small portion of Section 4 on Deer Island, just upstream of the DITP, is programmed in the FY14 CIP at a cost of \$3.54 million in FY14-15. Emergency removal of delaminated plastic liner from Section 186 was performed in June 2011. The rehabilitation project will include 2,000 feet of 108-inch sewer pipe.
3. Sewer asset protection rehabilitation design and construction of Section 4, 5, and 6 on the North Metropolitan Sewer in Winthrop is programmed in the FY14 CIP at a cost of \$13.0 million in FY15-20. The project will include rehabilitation of about 3,300 feet of 108-inch brick sewer that was previously rehabilitated using a shotcrete process in the 1990s.
4. Sewer asset protection rehabilitation via cured-in-place lining of approximately 1800 feet of Sewer Section 156 (and portions of Sections 17 and 19) located between Air Force Road and the Malden River in Everett was completed in October 2011. The project was completed at a

cost of \$2.56 million under a design/build agreement to expedite the rehabilitation of the 120 years old brick 61-inch x 56-inch rounded horseshoe sewer.

5. A corrosion and odor control project specific to design and construction of three biofilter air treatment systems to remove hydrogen sulfide from the Framingham Extension Sewer/Framingham Extension Relief Sewer (FES/FERS) and Wellesley Extension Sewer Replacement/Wellesley Extension Relief Sewer (WESR/WERS) is programmed in the FY14 CIP at a cost of \$2.76 million in FY19-22. Rehabilitation and/or replacement of hydrogen sulfide metering in the sewers is included in this project. In addition, design and construction for rehabilitation of the Framingham Extension Sewer/Framingham Extension Relief Sewer (FES/FERS) Tunnel is programmed in the FY14 CIP at a cost of \$8.5 million in FY19-22. A System-wide Corrosion and Odor Control Study to evaluate needs and identify solutions for hydrogen sulfide corrosion and odor problems is programmed in the FY14 CIP at a cost of \$1.0 million in FY19-21.
6. Wastewater Process Optimization - North System Hydraulic Capacity Study to evaluate the tributary flows and hydraulic capacity of the North Sewer System tributary to Chelsea Creek Headworks and to determine the feasibility of increasing and/or optimizing system capacity is programmed in the FY14 CIP at a cost of \$571,000 during FY12-14. This project could help identify options to mitigate occasional SSOs in the North System during extreme storm events. As a follow-up project, a North System Hydraulic Flood Engineering Analysis is programmed in the FY14 CIP at a cost of \$7.44 million during FY16-24. This project will evaluate the feasibility and hydraulic optimization benefits of construction of modifications to manholes and other structures to reduce inflow during periods of high river flows and flooding of wetland areas.
7. Siphon Structure Rehabilitation (Phase 1) for design and construction of the most critical recommended improvements to a portion of MWRA's siphons and siphon headhouses is programmed in the FY14 CIP at a cost of \$4.66 million during FY15-19. This project will include hydraulic capacity review, structural repairs of deteriorated conditions, stop plank construction, installation of new covers and/or appropriate access structures, and procurement of legal access easements to allow for proper maintenance. Planning should consider potential increases in flood elevations and tidal surge due to impacts from climate change.
8. MWRA's \$888 million Combine Sewer Overflows (CSO) Program includes a number of projects that will provide for the separation of sanitary sewer and stormwater flows. These projects will reduce stormwater inflow to the collection system. Details of MWRA's CSO Control Plan are reported under the requirements of NPDES Permit – Part I, Item 19. Long-term CSO Control Plan. Through FY13, \$838 million has been expended on MWRA's CSO Control Plan with additional projects scheduled for FY14-17.

ATTACHMENT 4  
TO  
MWRA ANNUAL I/I REDUCTION REPORT FOR FY13  
Reporting Period – July 2012 Through June 2013

**STATUS UPDATE ON MWRA’S  
I/I LOCAL FINANCIAL ASSISTANCE PROGRAM**

Financial Assistance Update

All 43 member sewer communities are participating in MWRA’s \$300.75 million Infiltration/Inflow (I/I) Local Financial Assistance (grant/loan) Program. The program began in May 1993 and, through FY13, \$248.5 million has been distributed to fund local I/I reduction and sewer system rehabilitation projects. The program budget of \$300.75 million includes the most recent addition of \$40 million in new Phase 8 funds approved by the MWRA Board of Directors for distribution beginning in FY13. The table on page 2 provides a summary of funding allocations, distributions, and funds remaining for each MWRA sewer community. Distribution of the most recent Phase 8 funding has been approved through FY21. The table on page 3 provides a summary of funding distributions by fiscal quarter since Program inception.

Program Background

MWRA’s I/I Local Financial Assistance Program was initiated to provide funding to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Following recommendations from the MWRA Advisory Board, the MWRA Board of Directors has approved a total program budget of \$300.75 million. The funds have been allocated among the 43 MWRA sewer communities based on respective share of MWRA’s wholesale sewer charge. Financial assistance for Phases 1 and 2 (total of \$63.75 million) was distributed for approved projects as a 25 percent grant and a 75 percent interest-free loan. The grant/loan split was revised for distribution of the Phase 3, 4, 5, 6, 7, and 8 funds (total of \$237 million) to a 45 percent grant and a 55 percent interest-free loan. The interest-free loan portion is repaid to MWRA over a five-year period beginning one year after the date the funds are distributed.

MWRA funding is provided to a community following execution of a standard agreement that stipulates the project scope, schedule, and loan repayment requirements. Communities are required to provide periodic schedule and expenditure progress reports to MWRA. For planning and design projects, the work products (reports, plans, specifications, and bidding documents) are reviewed and approved by MWRA. During construction, MWRA staff perform site visits to document progress.

Program Goals

The I/I Local Financial Assistance Program is a critical component of MWRA’s Regional I/I Reduction Plan. Specifically, local sewer system rehabilitation projects are intended to at least offset ongoing collection system deterioration to prevent a net increase in regional I/I. In the long-term, system rehabilitation should result in lower I/I, which will allow for future increases in sanitary (residential, commercial, industrial, and institutional) flow without a net increase in total wastewater flow to the Deer Island Treatment Plant.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM  
FUNDING SUMMARY AS OF JUNE 2013**

Community	Total Allocations (Phases 1 - 8)	Total Distributions (Phases 1 - 8)	Percent Distributed	Funds Remaining
Arlington	\$5,613,000	\$5,613,000	100%	\$0
Ashland	\$1,328,500	\$930,500	70%	\$398,000
Bedford	\$2,282,600	\$1,691,600	74%	\$591,000
Belmont	\$3,439,100	\$2,992,100	87%	\$447,000
Boston	\$85,585,200	\$80,641,576	94%	\$4,943,624
Braintree	\$5,319,000	\$3,425,800	64%	\$1,893,200
Brookline	\$8,605,200	\$5,526,400	64%	\$3,078,800
Burlington	\$3,304,800	\$3,285,800	99%	\$19,000
Cambridge	\$15,566,100	\$11,077,055	71%	\$4,489,045
Canton	\$2,675,900	\$1,645,900	62%	\$1,030,000
Chelsea	\$4,232,100	\$3,605,100	85%	\$627,000
Dedham	\$3,914,000	\$3,914,000	100%	\$0
Everett	\$5,229,500	\$3,141,500	60%	\$2,088,000
Framingham	\$8,025,000	\$5,003,000	62%	\$3,022,000
Hingham	\$1,032,500	\$589,500	57%	\$443,000
Holbrook	\$1,059,600	\$896,562	85%	\$163,038
Lexington	\$4,835,300	\$4,159,300	86%	\$676,000
Malden	\$7,825,900	\$4,593,900	59%	\$3,232,000
Medford	\$7,961,600	\$4,794,600	60%	\$3,167,000
Melrose	\$3,914,300	\$2,845,300	73%	\$1,069,000
Milton	\$3,736,500	\$3,251,500	87%	\$485,000
Natick	\$3,644,600	\$2,270,600	62%	\$1,374,000
Needham	\$4,269,600	\$2,892,150	68%	\$1,377,450
Newton	\$13,861,400	\$11,565,400	83%	\$2,296,000
Norwood	\$4,519,400	\$3,955,399	88%	\$564,001
Quincy	\$12,882,000	\$11,125,000	86%	\$1,757,000
Randolph	\$3,894,800	\$2,810,900	72%	\$1,083,900
Reading	\$2,941,100	\$2,520,100	86%	\$421,000
Revere	\$6,424,900	\$5,502,900	86%	\$922,000
Somerville	\$10,117,800	\$8,662,790	86%	\$1,455,010
Stoneham	\$3,291,900	\$3,291,900	100%	\$0
Stoughton	\$3,126,900	\$2,696,900	86%	\$430,000
Wakefield	\$3,932,900	\$3,396,900	86%	\$536,000
Walpole	\$2,404,000	\$1,928,300	80%	\$475,700
Waltham	\$9,022,400	\$7,808,400	87%	\$1,214,000
Watertown	\$4,185,800	\$2,581,800	62%	\$1,604,000
Wellesley	\$3,769,700	\$2,748,808	73%	\$1,020,892
Westwood	\$1,650,300	\$1,425,300	86%	\$225,000
Weymouth	\$7,490,900	\$5,349,300	71%	\$2,141,600
Wilmington	\$1,606,000	\$1,388,000	86%	\$218,000
Winchester	\$2,777,000	\$1,848,300	67%	\$928,700
Winthrop	\$2,221,400	\$1,926,400	87%	\$295,000
Woburn	\$7,229,500	\$7,229,500	100%	\$0
<b>Totals</b>	<b>\$300,750,000</b>	<b>\$248,549,040</b>	<b>83%</b>	<b>\$52,200,960</b>

MWRA I/I Local Financial Assistance Program - Fiscal Year Breakdown

FY	Distribution Cycle	Distribution Amount	Distribution Cycle	Distribution Amount	Distribution Cycle	Distribution Amount	Distribution Cycle	Distribution Amount	FY Total
FY93	Aug 1992	\$0	Nov 1992	\$0	Feb 1993	\$0	May 1993	\$2,714,883	\$2,714,883
FY94	Aug 1993	\$3,096,468	Nov 1993	\$4,096,133	Feb 1994	\$3,191,032	May 1994	\$251,494	\$10,635,127
FY95	Aug 1994	\$354,126	Nov 1994	\$976,700	Feb 1995	\$1,894,030	May 1995	\$6,489,891	\$9,714,747
FY96	Aug 1995	\$0	Nov 1995	\$504,100	Feb 1996	\$2,921,600	May 1996	\$3,902,426	\$7,328,126
FY97	Aug 1996	\$1,682,061	Nov 1996	\$1,581,266	Feb 1997	\$395,100	May 1997	\$3,530,758	\$7,189,185
FY98	Aug 1997	\$1,066,300	Nov 1997	\$1,157,260	Feb 1998	\$909,350	May 1998	\$2,001,608	\$5,134,518
FY99	Aug 1998	\$1,521,100	Nov 1998	\$2,464,263	Feb 1999	\$1,481,700	May 1999	\$5,758,077	\$11,225,140
FY00	Aug 1999	\$1,315,767	Nov 1999	\$1,847,900	Feb 2000	\$1,679,000	May 2000	\$1,070,100	\$5,912,767
FY01	Aug 2000	\$1,148,400	Nov 2000	\$388,000	Feb 2001	\$1,640,931	May 2001	\$804,800	\$3,982,131
FY02	Aug 2001	\$4,480,735	Nov 2001	\$704,040	Feb 2002	\$1,804,200	May 2002	\$5,002,691	\$11,991,666
FY03	Aug 2002	\$1,962,600	Nov 2002	\$4,461,768	Feb 2003	\$7,955,752	May 2003	\$1,836,600	\$16,216,720
FY04	Aug 2003	\$2,021,940	Nov 2003	\$1,306,200	Feb 2004	\$1,770,760	May 2004	\$3,295,400	\$8,394,300
FY05	Aug 2004	\$2,756,659	Nov 2004	\$6,013,436	Feb 2005	\$4,054,060	May 2005	\$2,636,700	\$15,460,855
FY06	Aug 2005	\$5,377,487	Nov 2005	\$4,589,600	Feb 2006	\$1,519,463	May 2006	\$6,489,676	\$17,976,226
FY07	Aug 2006	\$0	Nov 2006	\$4,947,414	Feb 2007	\$8,789,300	May 2007	\$8,121,023	\$21,857,737
FY08	Aug 2007	\$3,915,500	Nov 2007	\$4,355,750	Feb 2008	\$1,392,400	May 2008	\$4,436,600	\$14,100,250
FY09	Aug 2008	\$4,196,399	Nov 2008	\$352,000	Feb 2009	\$1,990,300	May 2009	\$4,872,400	\$11,411,099
FY10	Aug 2009	\$5,462,736	Nov 2009	\$616,600	Feb 2010	\$2,679,600	May 2010	\$4,845,000	\$13,603,936
FY11	Aug 2010	\$723,700	Nov 2010	\$3,183,250	Feb 2011	\$4,123,100	May 2011	\$4,258,900	\$12,288,950
FY12	Aug 2011	\$3,695,100	Nov 2011	\$2,417,378	Feb 2012	\$848,300	May 2012	\$7,010,324	\$13,971,102
FY13	Aug 2012	\$21,299,965	Nov 2012	\$1,004,610	Feb 2013	\$2,460,000	May 2013	\$2,675,000	\$27,439,575
Total		\$66,077,043		\$46,967,668		\$53,499,978		\$82,004,351	\$248,549,040



A second goal of the program is to assist member communities in implementing effective annual local collection system maintenance programs to assure efficient operation and ongoing repair/replacement of the collection system.

Type of Local Projects Receiving Funding

Funding has been provided to local communities for eligible I/I reduction projects including planning, design, construction, and engineering services during construction. These projects generally take one to three years to complete. Seventy-five percent of funds distributed to date have financed local construction projects. The table below details funds distributed by project phase for both completed and ongoing projects.

<u>PROJECT PHASE</u>	<u>COMPLETE PROJECTS (\$ millions)</u>	<u>ONGOING PROJECTS (\$ millions)</u>	<u>TOTAL (\$ millions)</u>
Planning/Study:	\$ 33.4	\$ 3.6	\$ 37.0 (15%)
Design:	9.6	2.3	11.9 (5%)
Construction:	147.0	40.0	187.0 (75%)
Eng. Services During Const.:	<u>10.5</u>	<u>2.1</u>	<u>12.6 (5%)</u>
TOTAL	\$200.5 (81%)	\$ 48.0 (19%)	\$ 248.5 (100%)

Program Results

The I/I Local Financial Assistance Program began in May 1993. Through FY13, a total of 444 local I/I reduction and sewer system rehabilitation projects have been funded through the MWRA’s grant/loan program. Cumulative results for the program are summarized below.

Results for all projects (FY93 through FY13) for planning/inspection include the following:

- 1,364 miles of sewer TV inspected
- 962 miles of sewer flow isolated
- 1,108 miles of sewer smoke tested
- 37,530 sewer manholes inspected
- 60,980 buildings inspected

Results for all projects (FY93 through FY13) targeting infiltration reduction include the following:

- 50 miles sewer replaced
- 82 miles sewer CIP lined
- 132 miles sewer tested/chemically sealed
- 2,160 sewer spot repairs
- 7,730 service connection repairs
- 4.7 miles underdrains sealed

Results for all projects (FY93 through FY13) targeting inflow reduction include the following:

- 923 catch basins disconnected
- 39 miles of new or replaced storm drains
- 10,750 manholes rehabilitated/sealed
- 1,680 manhole covers replaced or inflow seals installed
- 415 sump pumps redirected
- 5,190 downspouts/area drains disconnected

## Estimated I/I Reduction

The system annual average daily flow is approximately 360 mgd; minimum dry weather flows drop to 260 mgd; peak wet weather capacity to the Deer Island Treatment Plant is 1,270 mgd (more than 3.5 times the average flow), and some additional system capacity is available at combined sewer overflow (CSO) outfalls. Few problems exist within local and regional sewer systems during dry weather or as a result of small and medium storm events. However, high levels of I/I (as well as stormwater from combined sewers) reduce pipeline capacity in the collection system that would otherwise be available to transport sanitary flow. The result, during extreme storm events, may be sewer system surcharging and sanitary sewer overflows (SSOs). I/I also results in the transport of groundwater and surface water out of the natural watershed.

The estimated average daily flow reduction associated with completed local I/I reduction projects that have received MWRA financial assistance is about 82 million gallons per day (mgd). This flow reduction “ballpark” figure is based on the communities’ (or their consultants’) peak I/I reduction estimates, which have been prorated by MWRA staff to estimate an annual average I/I reduction. Some additional I/I reduction may be expected from projects not funded by MWRA. The estimated I/I reduction represents groundwater and stormwater that no longer enter the collection system at the point of repair. Regional wastewater flow reductions resulting from specific local I/I reduction projects are difficult to substantiate through end-of-the-collection-system meter data, due to factors noted below:

- Wastewater flows within the collection system vary dramatically due to changes in precipitation. For example, annual average daily flow for MWRA’s system varies up to 100 mgd from year to year (from a low of less than 300 mgd to a high of more than 400 mgd). Small flow reductions for individual projects (typically less than one mgd) are dwarfed by regional flow fluctuations;
- Sewer capacity gained by elimination of I/I in one subsystem may, in some cases, allow for other I/I to enter the collection system at a different location, resulting in less net flow reduction at the end of the collection system;
- MWRA’s numerous pumping and interceptor upgrades, as well as combined sewer overflow and system optimization projects result in an increase in the capture and treatment of wastewater flow and the reduction of raw sewage discharges. When reviewing end-of-the-collection system meter data, these increased flows to the Deer Island Treatment Plant offset upstream I/I reductions; and,
- Over the last 20 years sewered population in the service area has increased by about 150,000 leading to an increase in sanitary sewage. Conversely, during the same 20 year period, per capita water use returned to the sewer system has decreased due to installation of low-flow plumbing fixtures and appliances leading to a decrease in sanitary sewage.

Taking these factors into account, long-term metering records will continue to be analyzed to monitor regional wastewater flow trends. The graph shown on page 7 presents long-term (24 years from 1989 through 2012) regional flow data for the Deer Island Treatment Plant collection system and annual rainfall. The 24-year average daily flow for the total system was 364 mgd and the average annual rainfall over those 24 years was 44 inches (local NOAA site at Boston Logan Airport). Over the last three years (2010/2011/2012), MWRA’s average daily wastewater

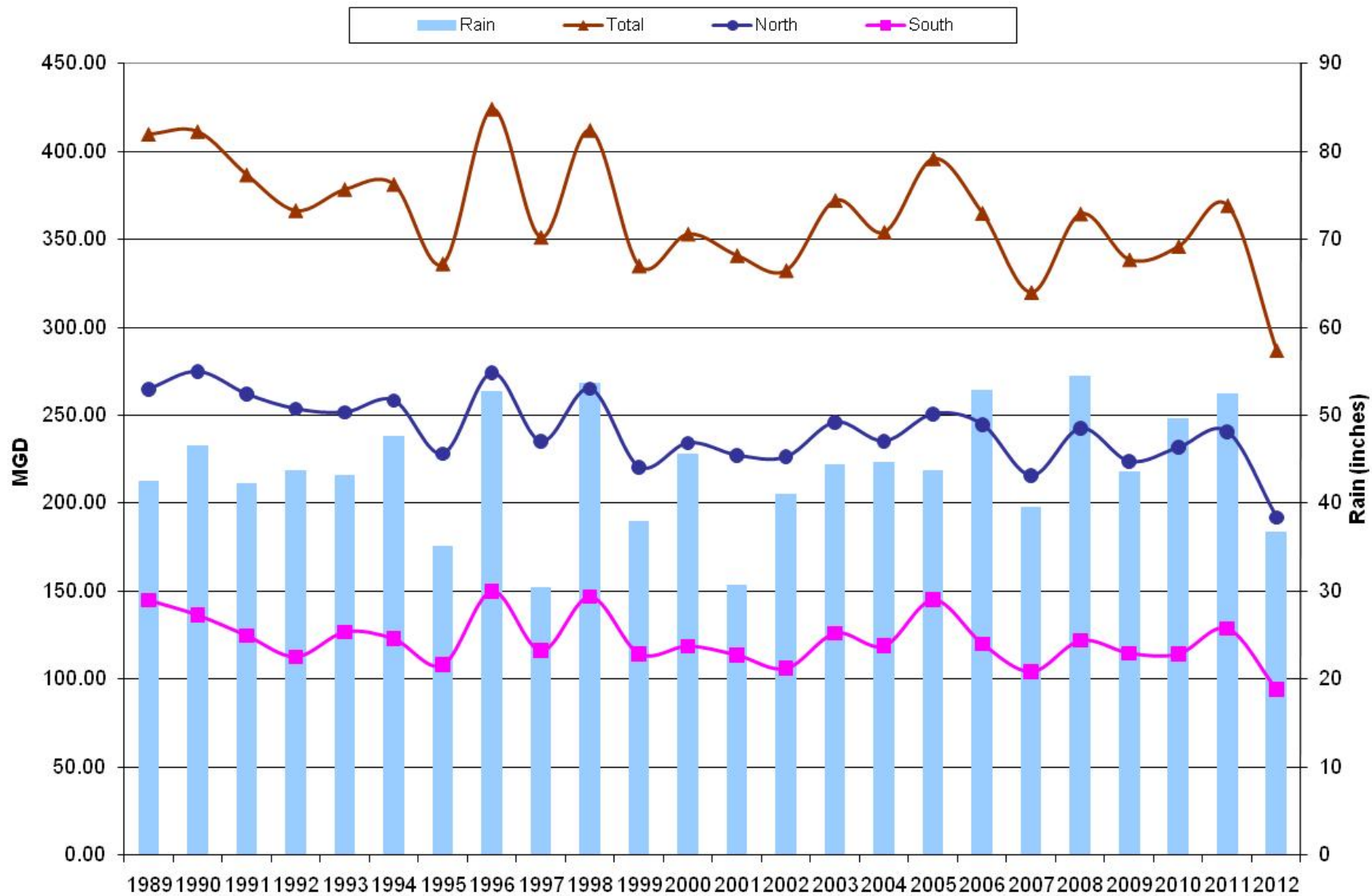
flow has been well below the 24-year average at 334 mgd; even though the three-year rainfall has been slightly above average at 46 inches. Calendar year 2012 was quite dry with only 37 inches of rainfall. MWRA's calendar year 2012 average daily wastewater flow represents a record low, dropping below 300 mgd for the first time.

The same 24-year (1989 through 2012) long-term regional flow and annual rainfall data are presented again on page 8, both recalculated as 5-year running averages. The 5-year running average smoothes the extreme highs and lows within the annual data. The 5-year running average data over the last 24-years clearly shows the regional wastewater flow trend is modestly declining while the annual rainfall trend is modestly increasing. The data show an approximate 40 mgd reduction in wastewater flow during the last 24 year period while annual rainfall totals for the metro-Boston area have increase a few inches over the same period.

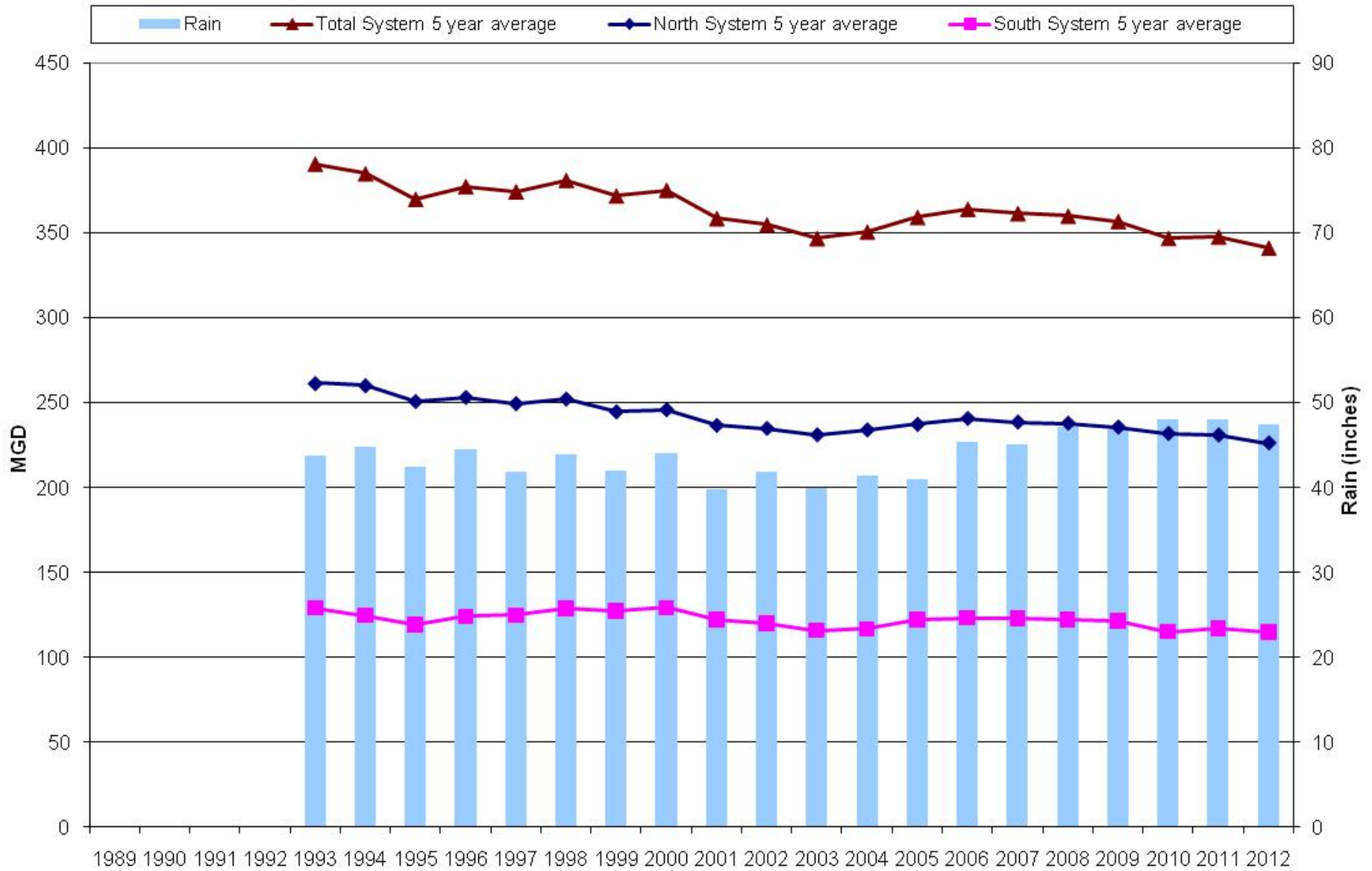
#### Community Projects Funded During FY13

Local community projects are funded quarterly under the MWRA I/I Local Financial Assistance Program. Attached (after page 8) are funding summaries for the four quarterly funding distributions during FY13: August 2012 (one community funded: Boston), November 2012 (two communities funded: Boston and Stoneham), February 2013 (three communities funded: Arlington, Burlington, and Cambridge), and May 2013 (five communities funded: Braintree, Brookline, Dedham, Norwood, and Woburn).

### MWRA Long-Term Regional Flow Data NOAA Annual Rainfall at Logan Airport



**MWRA Long-Term Regional Flow Data  
5-year Running Averages  
5 year running average NOAA Rainfall at Logan Airport**



# MWRA I/I Local Financial Assistance Program Funding Summary

August 2012 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Boston	\$21,299,965
Total	\$21,299,965

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM  
ATTACHMENT A-1  
PROJECT NO. WRA-P8-05-3-801**

**BWSC DRAINAGE, WATER AND SEWERAGE WORKS IMPROVEMENTS (2012 CIP)**

**MASS AVE – ROXBURY SEPARATION**

**BWSC CONTRACT NO. 12-309-004**

**SCOPE OF SERVICES**

This project will separate sewer flows from the Mass Ave area of Roxbury. The project work area is located in New Market Square and bordered by the following: Southhampton Street / Gerard Street / Norfolk Avenue / New Market Square Shopping Center. The separation of sewers and drains achieved by this project will result in a decrease of combined sewer overflows that currently discharge to the Fort Point Channel. Separation of the New Market Square area was not included in the MWRA's CSO Plan.

Work to be performed under this project includes, but is not necessarily limited to contracted sewer installation of approximately 8145 linear feet (LF) of 10 to 48-inch sewer pipe, 11,600 LF of 12 to 48-inch drain pipe and 4759 LF of minor drain; installation of 90 manholes and 94 catch basins; disconnecting 30 downspouts; structurally lining 280 LF of sewer/drain pipe; cleaning and TV inspecting 2515 LF of 8 to 48-inch sewer pipe; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications of BWSC Contract No. 12-309-004 [Drainage, Water and Sewerage Works Improvements (2012 CIP), Mass Ave – Roxbury Separation: Replacement and Installation of Storm Drains, Sanitary Sewers and Water Mains in Roxbury] and the approved MWRA Phase 8 I/I Local Financial Assistance Project Application received April 12, 2012.

The area being separated by this project is approximately 66 acres. The peak and average annual inflow reductions are estimated to be 29.7 mgd and 0.17 mgd, respectively. Total project cost is estimated at \$12,716,664. Eligible MWRA I/I Local Financial Assistance is \$5,645,512 (Construction = \$5,645,512).

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction	July 2012	October 2014

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM  
ATTACHMENT A-2  
PROJECT NO. WRA-P8-05-3-802**

**BWSC DRAINAGE, WATER AND SEWERAGE WORKS IMPROVEMENTS (2012 CIP)**

**MASS AVE – DORCHESTER SEPARATION**

**BWSC CONTRACT NO. 12-309-008**

**SCOPE OF SERVICES**

This project will separate sewer flows from the Mass Ave area of Dorchester. The project work area is located in the New Market Square area (just southeast of the New Market Square Shopping Center) and bordered by the following streets: Mass Ave / Roseclair Street / Mount Vernon Street / Boston Street / West Bellflower Street / Allstate Road. The separation of sewers and drains achieved by this project will result in a decrease of combined sewer overflows that currently discharge to the Fort Point Channel. Separation of the New Market Square area was not included in the MWRA's CSO Plan.

Work to be performed under this project includes, but is not necessarily limited to contracted sewer installation of approximately 4560 linear feet (LF) of 10 to 24-inch sewer pipe, 6950 LF of 10 to 48-inch drain pipe and 1180 LF of minor drain; installation of 54 manholes and 33 catch basins; disconnecting 19 downspouts; structurally lining 910 LF of sewer/drain pipe; cleaning and TV inspecting 960 LF of 8 to 30-inch sewer pipe; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications of BWSC Contract No. 12-309-008 [Drainage, Water and Sewerage Works Improvements (2012 CIP), Mass Ave – Dorchester Separation: Replacement and Installation of New Storm Drains, Sewers and Water Mains in Dorchester] and the approved MWRA Phase 8 I/I Local Financial Assistance Project Application received April 24, 2012.

The area being separated by this project is approximately 34 acres. The peak and average annual inflow reductions are estimated to be 15.3 mgd and 0.09 mgd, respectively. Total project cost is estimated at \$7,685,946. Eligible MWRA I/I Local Financial Assistance is \$4,512,785 (Construction = \$4,512,785).

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction	July 2012	October 2013



**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM  
ATTACHMENT A-3  
PROJECT NO. WRA-P8-05-3-803**

**BWSC DRAINAGE, SEWERAGE AND WATER WORKS IMPROVEMENTS (2011 CIP)**

**DUDLEY SQUARE SEWER SEPARATION**

**BWSC CONTRACT NO. 11-309-009**

**SCOPE OF SERVICES**

This project will separate sewer flows from the Dudley Square area of Roxbury. The project work area is located in the Dudley Square area and bordered by the following streets: Melnea Cass Boulevard / Mount Pleasant Avenue / Circuit Street / Washington Street. The separation of sewers and drains achieved by this project will result in a decrease of combined sewer overflows that currently discharge to the Fort Point Channel. Separation of the Dudley Square area was not included in the MWRA's CSO Plan.

Work to be performed under this project includes, but is not necessarily limited to contracted sewer installation of approximately 4620 linear feet (LF) of 10 to 42-inch sewer pipe, 9635LF of 12 to 54-inch drain pipe and 2250 LF of minor drain; installation of 89 manholes and 9 catch basins; disconnecting 70 downspouts; structurally lining 2530 LF of sewer/drain pipe; performing 46 point repairs; cleaning and TV inspecting 9730 LF of 8 to 48-inch sewer pipe; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications of BWSC Contract No. 11-309-0098 [Drainage, Sewerage and Water Works Improvements (2011 CIP), Dudley Square Sewer Separation: Installation of New Storm Drains, Sanitary Sewers and Water Mains in Roxbury] and the approved MWRA Phase 8 I/I Local Financial Assistance Project Application received May 3, 2012.

The area being separated by this project is approximately 130 acres. The peak and average annual inflow reductions are estimated to be 58 mgd and 0.34 mgd, respectively. Total project cost is estimated at \$15,382,891. Eligible MWRA I/I Local Financial Assistance is \$10,319,812 (Construction = \$10,319,812).

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction	July 2012	September 2014

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM  
ATTACHMENT A-4  
PROJECT NO. WRA-P8-05-3-804**

**BWSC WATER AND SEWERAGE WORKS IMPROVEMENTS**

**INSTALLATION / REHABILITATION OF STORM DRAINS AND SEWERS  
IN THE FENWAY (ST. MARY'S STREET AREA)**

**BWSC CONTRACT NO. 11-309-008**

**SCOPE OF SERVICES**

This project will separate sewer flows from the Audubon Circle area of the Fenway. The project work area is bordered by: St. Mary's Street / Mountfort Street / Maitland Street / MBTA Riverside Green Line. The separation of sewers and drains achieved by this project will result in a decrease of combined sewer overflows that currently discharge to the Charles River.

Work to be performed under this project includes, but is not necessarily limited to contracted sewer installation of approximately 2350 linear feet (LF) of 12 to 18-inch sewer pipe, 840 LF of 12 to 18-inch drain pipe and 1650 LF of minor drain; installation of 16 manholes and 3 catch basins; structurally lining 2590 LF of sewer/drain pipe; performing one point repair; cleaning and TV inspecting 2590 LF of sewer/drain pipe; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications of BWSC Contract No. 11-309-008 (Water and Sewerage Works Improvements: Installation / Rehabilitation of Water Mains, Storm Drains and Sewers in the Fenway) and the approved MWRA Phase 8 I/I Local Financial Assistance Project Application received June 18, 2012.

The area being separated by this project is approximately 30 acres. The peak and average annual inflow reductions are estimated to be 13 mgd and 0.08 mgd, respectively. Total project cost is estimated at \$2,271,347. Eligible MWRA I/I Local Financial Assistance is \$821,856 (Construction = \$821,856).

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction	August 2012	September 2014

# MWRA I/I Local Financial Assistance Program Funding Summary

November 2012 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Boston	\$ 580,610
Stoneham	\$ 424,000
Total	\$ 1,004,610

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM**  
**PROJECT NO. WRA-P8-05-1-805**  
**MASS AVE SEWER SEPARATION: CONSTRUCTION MANAGEMENT SERVICES**  
**BWSC CONTRACT NO. 11-206-012**

**SCOPE OF SERVICES**

This project will provide Engineering and Resident Representation Services During Construction for the following two BWSC sewer separation projects:

1. BWSC Contract No. 12-309-004 (MWRA Project No. WRA-P8-05-3-801)  
Mass Ave – Roxbury Sewer Separation (New Market Square)
2. BWSC Contract No. 12-309-008 (MWRA Project No. WRA-P8-05-3-802)  
Mass Ave – Dorchester Sewer Separation (New Market Square Area)

The above sewer separation projects were financed during the August 2012 funding cycle of the MWRA I/I Local Financial Assistance Program.

The following services will be required during the project:

**Task A – Project Administration:** Work will include, but not be limited to, the preparation of a Work Plan/Schedule and Monthly Progress Reports and participation in meetings with Commission staff to review the course of the project.

**Task B – Construction Services:** The purpose of the proposed supervision contract is the review, administration and management of Construction Services for the installation of separation improvements. **Task B1** (Pre-Construction Services) work will include, but not be limited to, Plan and Specification Final Review; review/evaluate/recommend project bid acceptability; review/evaluate bonds and insurances; and develop a public information/community relations work plan. **Task B2** (Contract Administration and Coordination) work will include, but not be limited to, overall project administration/management/coordination/communication. **Task B3** (Construction Field Observation) work will include, but not be limited to, observing daily construction and recording site conditions during and at the end of each workday for conformance with contract documents and the performance of all other work pursuant to the terms and conditions detailed within the Contract For Professional Services By And Between The Boston Water And Sewer Commission And CDM Smith Inc. (Contract 11-206-012) dated March 19, 2012 and the approved MWRA Phase 8 I/I Local Financial Assistance Project Application received August 23, 2012.

Total project cost is estimated at \$1,228,036. Eligible MWRA I/I Local Financial Assistance is \$580,610 (Construction Management Services = \$580,610).

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction Management Services	March 2012	October 2014

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P8-31-3-807

TOWN OF STONEHAM

PLANNING, DESIGN & CONSTRUCTION  
OF  
PHASE 4 SANITARY SEWER SYSTEM REHABILITATIONS

SCOPE OF SERVICES

This project consists of the work associated with the final planning, design and construction of sewer rehabilitations as presented in the Contract Documents entitled "Phase 4 Sanitary Sewer System Rehabilitation" dated September 2012 including associated engineering administration and on-site services during construction.

Under the final planning phase, prior studies, reports and inspection data performed throughout the Town's sewer system were reviewed with Town officials and evaluated to determine the sewer rehabilitations to be included under Phase 4. Consequently, the sewer rehabilitation work is located in multiple areas throughout the Town.

Sewer rehabilitations are as presented in the Contract Documents entitled "Phase 4 Sanitary Sewer System Rehabilitations" dated September 2012.

The sewer rehabilitation work includes but is not limited to: cleaning and closed circuit television inspection of approximately 9,400 linear feet of 6-inch through 12-inch diameter sewer pipe; pressure testing and sealing of approximately 3,200 joints of 6-inch through 12-inch diameter sewer pipe; pressure testing and sealing of approximately 136 service connections in 6-inch through 12-inch sewer pipe; installation of approximately 18 cured-in-place spot repair liners in 8-inch through 12-inch diameter sewer pipe; installation of approximately 4,600 linear feet of cured-in-place pipe liner in 8-inch through 12-inch diameter sewer pipe; and associated appurtenances and all other related work.

PROJECT COST SUMMARY

<u>Description of Task</u>	<u>Estimated Cost</u>
Final Planning & Design Services	\$ 65,000
Construction of Sewer Rehabilitations	\$ 350,000
Engineering Services During Construction	\$ 85,000
<b>TOTAL ESTIMATED PROJECT COST</b>	<b><u>\$ 500,000</u></b>

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P8-31-3-807

TOWN OF STONEHAM

PLANNING, DESIGN & CONSTRUCTION  
OF  
PHASE 4 SANITARY SEWER SYSTEM REHABILITATIONS

PROJECT SCHEDULE

<u>Milestone</u>	<u>Start Date</u>	<u>Completion Date</u>
Final Planning & Design	May 2012	September 2012
Bidding & Award	September 2012	November 2012
Sewer Rehabilitations Construction	November 2012	May 2013
Warranty Inspection & Closeout	March 2014	June 2014

# MWRA I/I Local Financial Assistance Program Funding Summary

February 2013 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Arlington	\$ 720,000
Burlington	\$ 440,000
Cambridge	\$ 1,300,000
Total	\$ 2,460,000

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P8-01-3-808**

**TOWN OF ARLINGTON**

**CONSTRUCTION OF PHASE #5 SANITARY SEWER REHABILITATIONS  
BID INVITATION #12-46**

**SCOPE OF SERVICES**

This sewer rehabilitation project (**Bid No. 12-46 Phase #5 Sanitary Sewer Rehabilitations**) is a result of the I/I sources identified during the Area #6 Sewer System Investigation Planning Program (SSIPP) Study. The sewer rehabilitation work will mainly take place in Sewer Subareas 21, 40, 41, 45, & 50. The sewer rehabilitation contract to be awarded will include the Base Bid and Alternate Bid No. 1.

The Base Bid includes approximately: 9,993 linear feet of cured-in-place pipe; cutting of three (3) protruding service connections; testing & grouting of 37 service connections; reinstating & grouting 99 service connections in cured-in-place pipe; cleaning, inspection, testing & sealing of 2,504 linear feet of pipe; 10,615 linear feet of root treatment; root treatment of four (4) sewer manholes; 31 linear feet of short liners; installation of two (2) new manhole frames & covers; installation of ten (10) manhole inflow dishes; exterior grouting & interior sealing of 623 vertical feet of sewer manholes; installation of one (1) precast manhole; 12,497 linear feet of post-construction flow isolation; and other related tasks.

Alternate Bid No. 1 includes approximately: 1,349 linear feet of cured-in-place pipe; cutting of six (6) protruding service connections; testing & grouting of 12 service connections; reinstating & grouting 26 service connections in cured-in-place pipe; cleaning, inspection, testing & sealing of 1,641 linear feet of pipe; installation of 9 linear feet of short liners; rebuilding of one (1) manhole bench and invert; exterior grouting & interior sealing of 75 vertical feet of sewer manholes; installation of one (1) precast manhole; 2,990 linear feet of post-construction flow isolation; and other related tasks.

Engineering services provided during the construction of the sewer rehabilitations are also included.

The Area #6 Sewer System Investigation Planning Program (SSIPP) Study was funded under MWRA Project #WRA-P7-01-1-734.

**SUMMARY OF PROJECT COSTS**

Construction of Phase #5 Sanitary Sewer Rehabilitations (Bid Invitation #12-46)	\$ 656,663
Engineering Services During Construction of Phase #5 Sewer Rehabilitations	\$ 149,390
	-----
<b>TOTAL ESTIMATED PROJECT COST</b>	<b>\$ 806,053</b>



**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P8-01-3-808**

**TOWN OF ARLINGTON**

**CONSTRUCTION OF PHASE #5 SANITARY SEWER REHABILITATIONS  
BID INVITATION #12-46**

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Phase #5 Sanitary Sewer Rehabilitations	February 2013	July 2014

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P8-08-2-809

TOWN OF BURLINGTON

SEWER SYSTEM EVALUATION SURVEY IN SPECIFIC AREAS;  
EVALUATION & COMPARISON OF SEWER FLOWS @ PUMP STATIONS WITH WATER USE  
DATA; EVALUATION OF MANHOLES IN LOCALIZED FLOODING AREAS; BUILDING  
INSPECTION PROGRAM IN SPECIFIC AREAS

SCOPE OF SERVICES

**Sewer System Evaluation Survey In Specific Areas** This project includes 2 major investigation tasks. Under the first task, approximately 10,750 lf of the sewer interceptor from Long Street to the Terrace Hall Avenue Pump Station will be cleaned and internally inspected to identify sources of I/I. The second task includes the topside manhole inspections of up to 993 manholes throughout the town that have not been previously inspected. A Summary of Results document will be prepared which will present the results of the field work; identify those sewer segments and manholes which appear to contribute excessive I/I; present specific conclusions and recommendations for sewer rehabilitations and associated cost that includes a cost-effectiveness analysis.

**Evaluation & Comparison of Sewer Flows @ Pump Stations with Water Use Data** Under this project, the pump station flow data will be evaluated and compared to water use data. This evaluation will be used to identify areas tributary to the pump stations with excessive I/I.

**Evaluation of Manholes in Localized Flooding Areas** Under this project, a GIS sewer map of the Town will be prepared with overlays of the 100-Year Flood plain and wetland areas to identify specific areas where the potential exists for manhole covers to become inundated during flood conditions. This map will be reviewed with Town personnel to add any other localized flooding areas. The intention of this project is to provide recommendations for the installation of manhole inflow dishes.

**Building Inspection Program in Specific Areas** Under this project, building inspections will be performed in pump station tributary areas that have not been previously inspected. Those pump station tributary areas are: Francis Wyman, Douglas Ave, Wilmington Rd, Brookside Lane, Westwood St, Grandview Ave, Lucaya Circle & Town Line Rd. Approximately 3,000 building inspection will be performed. A Summary of Results document will be prepared which will present the results of the field work, identify those building with inflow sources and improper connections.

PROJECT COST SUMMARY

<u>Description of Task</u>	<u>Estimated Cost</u>
Sewer System Evaluation Survey in Specific Areas	\$ 132,200
Evaluation & Comparison Sewer Flows @ Pump Stations	\$ 20,000
Evaluation of Manholes in Localized Flooding Areas	\$ 2,500
Building Inspection Program in Specific Areas	\$ 285,300
TOTAL ESTIMATED PROJECT COST	<u>\$ 440,000</u>

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P8-08-1-809**

**TOWN OF BURLINGTON**

**SEWER SYSTEM EVALUATION SURVEY IN SPECIFIC AREAS;  
EVALUATION & COMPARISON OF SEWER FLOWS @ PUMP STATIONS WITH WATER USE  
DATA; EVALUATION OF MANHOLES IN LOCALIZED FLOODING AREAS; BUILDING  
INSPECTION PROGRAM IN SPECIFIC AREAS.**

**PROJECT SCHEDULE**

<u>General Description of Work Performed</u>	<u>Start Date</u>	<u>Completion Date</u>
Sewer System Evaluation Survey in Specific Areas	March 2013	August 2013
Evaluation & Comparison Sewer Flows @ Pump Stations	June 2013	September 2013
Evaluation of Manholes in Localized Flooding Areas	March 2013	April 2013
Building Inspection Program in Specific Areas	March 2013	December 2013

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT  
PROJECT NO. WRA-P8-09-3-810**

**CITY OF CAMBRIDGE**

**CONSTRUCTION OF COMMON MANHOLE REMOVAL CONTRACT #7**

**SCOPE OF SERVICES**

This project involves the work associated with the separation of the remaining 34 common manholes located throughout the City. The specific locations and number of common manholes are: Murray Hill Road (3); Bay Street (1); Green Street (1); Franklin Street (2); Tudor Street (1); Decatur street (2); Anglim Street (1); Emily Street (1); Valentine Street (3); Speridakes Terrace (2); Hamilton Street (1); Main Street (3); MIT near Amherst Alley (4); MIT near Memorial Drive (2); U.S. Department of Transportation Volpe Center (4); Harvard University near Fernald Drive (2); Harvard University near Memorial Drive (1).

All common manholes except for the three (3) common manholes on Main Street will be removed under Common Manhole Removal Contract #7. The three (3) common manholes on Main Street will be removed as part of the "Fawcett Street and Smith Place Roadway Improvements Project" as Alternate #1.

The storm drainage all the locations are tributary to the Charles River except for the Murray Hill Road locations which are tributary to the Alewife Brook which ultimately discharges to the Mystic River. The sanitary sewers for all locations flow to the MWRA Ward Street Headworks Facility except for the Murray Hill Road locations which discharge to the MWRA Alewife Brook Interceptors and the U.S. Department of Transportation Volpe Center locations which flow to the MWRA Cambridge Branch Sewer. The scope of work for this project only includes the construction cost. Engineering services during construction is expected to be provided by the City's engineering staff. No funding for this portion of the project is being requested at this time.

**PROJECT COST SUMMARY**

<u>DESCRIPTION OF WORK</u>	<u>TOTAL COST</u>	<u>ELIGIBLE COST</u>
Construction of Common Manhole Removal Contract #7	\$ 1,300,000.00	\$ 1,300,000.00

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P8-09-3-810

CITY OF CAMBRIDGE

CONSTRUCTION OF COMMON MANHOLE REMOVAL CONTRACT #7

PROJECT SCHEDULE

<u>Task Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction of Common Manhole Removal Contract #7	April 2013	September 2015

# MWRA I/I Local Financial Assistance Program Funding Summary

May 2013 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Braintree	\$ 316,800
Brookline	\$ 414,200
Dedham	\$ 473,000
Norwood	\$ 600,000
Woburn	\$ 871,000
Total	\$ 2,675,000

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF BRAINTREE, MASSACHUSETTS  
TOWN-WIDE I/I INVESTIGATION AND REHABILITATION PROGRAM - YEAR 2  
MWRA PROJECT NO. WRA-P8-06-3-812**

**SCOPE OF SERVICES**

Year 2 of the Town-Wide I/I Investigation and Rehabilitation Program will be conducted in an effort to identify, rehabilitate and reduce excessively high flows presently found in the sanitary sewer system. Year 1 project work will be concentrated in Braintree Sewer Subareas D1 / F2 / H1 / H2 and V2. Project work will include, but not be limited to, the following:

1. **Flow Isolation:** Flow isolation work will be undertaken in approximately 47,000 linear feet (LF) of sewer in Subareas D1 / F2 / H1 / H2 / V2 as detailed in the July 2011 Annual Town-Wide Sewer Investigation & Rehabilitation Report.
2. **Internal Television Inspection:** Light cleaning and internal TV inspection/recording will be performed in approximately 47,000 LF of sewer in Subareas D1 / F2 / H1 / H2 / V2. The inspection will be conducted in the Spring when groundwater levels are typically at their highest.
3. **Physical Manhole Survey:** Topside physical survey of approximately 250 sewer manholes will be performed in Subareas D1 / F2 / H1 / H2 / V2. A written inspection log will be furnished for each manhole.
4. **Database Development / Letter Report:** Data collected through the above investigations will be added to the existing Town database. The database will include sewer system information such as pipe lengths/diameters, street names and information from tasks performed as part of this study, such as sewer manhole investigation reports, and other pertinent information relating to the project. A letter report will be prepared that details areas in which work was performed, summarizes work completed to date and includes recommendations, a cost-effectiveness analysis for rehabilitation of pipeline/manhole defects and I/I sources identified during this investigation. An opinion of probable rehabilitation design/construction cost will also be provided.
5. **Rehabilitation Contract Documents:** Construction plans and specifications (to remove excessive I/I identified during this investigation) will be developed and submitted, followed by rehabilitation construction.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the Town of Braintree and Weston & Sampson Engineers, Inc. and the approved MWRA Phase 8 I/I Local Financial Assistance Project Application received April 23, 2013.

Total project cost is estimated at \$666,000. Eligible MWRA I/I Local Financial Assistance is \$316,800 (Investigation = \$147,200 / Design & Bidding = \$50,000 / Rehabilitation Construction = \$119,600).

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF BRAINTREE, MASSACHUSETTS  
TOWN-WIDE I/I INVESTIGATION AND REHABILITATION PROGRAM - YEAR 2  
MWRA PROJECT NO. WRA-P8-06-3-812**

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Investigative Field Work	April 2013	May 2013
Review / CEA / Letter Rpt	June 2013	November 2013
Town / MWRA Review	December 2013	December 2013
Planning / Design Phase	January 2014	February 2014
Town / MWRA Review	February 2014	February 2014
Advertise in Central Register	March 2014	March 2014
Open Bids	March 2014	March 2014
Award Contract	April 2014	April 2014
Construction	May 2014	August 2014
Retesting	March 2015	April 2015



**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P8-07-3-815**

**TOWN OF BROOKLINE**

**SCOPE OF SERVICES**

**CONTRACT NO. PW/12-34: SEWER REHABILITATIONS**

The sewer rehabilitation work under this construction contract will be performed in portions of the following streets: Beacon Street, Beaconsfield Road, Buckminster Road, Circuit Road, Clark Road, Crafts Road, Eliot Crescent, Eliot Street, Evans Road, Reservoir Road, Salisbury Road and Valley Road.

This sewer rehabilitation work will consist of but not be limited to: installation of approximately 6,440 linear feet of 8-inch to 18-inch cured-in-place pipe (CIPP) liner; 9 spot repairs by installation of CIPP short liner; rebuilding 4 manhole inverts; sealing and cementitious lining approximately 406 vertical feet of manholes; and all associated appurtenant work.

**CONTRACT NO. PW/ 13-14: VARIOUS SEWER AND DRAIN IMPROVEMENTS**

The work under this construction contract that is eligible for MWRA funding is only the sewer rehabilitation /repair work. This specific work consists of the spot repair by dig and replace of the following: 18-inch sewer on Beacon Street; 18-inch sewer on Beaconsfield Road; reconstruction of sewer manhole on Dean Road; and all associated appurtenant work. The specific Bid Items that are eligible for the MWRA funding are Bid Items #1, 2 & 3.

**PROJECT COST SUMMARY**

<u>Description of Work</u>	<u>Total Cost (1)</u>	<u>Eligible Cost</u>
Contract No. PW/12-34: Sewer Rehabilitation	\$ 480,590	\$ 480,590
Contract No. PW/13-14: Various Sewer & Drain Improvements	\$ 262,995	\$ 82,523
<b>TOTAL ESTIMATED PROJECT COST,</b>	<u><b>\$ 743,585</b></u>	<u><b>\$ 563,113</b></u>

Note: (1) Costs shown are As-Bid Costs

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P8-07-3-815

TOWN OF BROOKLINE

CONTRACT NO. PW/12-34: SEWER REHABILITATIONS  
AND  
CONTRACT NO. PW/ 13-14: VARIOUS SEWER AND DRAIN IMPROVEMENTS

PROJECT SCHEDULE

<u>Milestone Description</u>	<u>Start Date</u>	<u>Completion Date</u>
Contract No. PW/12-34: Sewer Rehabilitations		
Bid & Award	February 2013	April 2013
Construction	May 2013	December 2013
Contract No. PW/13-14: Sewer & Drain Improvements		
Bid & Award	February 2013	April 2013
Construction	May 2013	December 2013

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF DEDHAM, MASSACHUSETTS  
I/I IDENTIFICATION AND REHABILITATION PROGRAM - YEAR ONE  
MWRA PROJECT NO. WRA-P8-12-3-811**

**SCOPE OF SERVICES**

Year One of the Town-Wide I/I Identification and Rehabilitation Program will be conducted in an effort to identify, rehabilitate and reduce excessively high flows presently found in the sanitary sewer system. Project work will include, but not be limited to, the following:

- 1. Inflow Investigation (Smoke / Dye Testing and Dye Flooding):** In Spring 2011, the Town embarked on a comprehensive Town-Wide Flow Monitoring Program. Using data from this Program, fourteen subareas had excessive inflow warranting further investigation through smoke testing. In Fall 2012, smoke testing was performed in seven of the recommend subareas (HH / II / JJ / NN / PP / TT / WW). Work under this project includes smoke testing the remaining seven subareas (GG / KK / LL / OO / QQ / RR / SS). A total of 150,000 linear feet (LF) of sewer will be targeted. To confirm the nature of inflow sources identified through smoke testing, dye testing and dye flooding will be performed. Project work includes twenty dye tests and ten dyed-floods in conjunction with TV inspection.
- 2. Infiltration Investigation (Smoke / Dye Testing and Dye Flooding):** Year One Infiltration Investigations will be undertaken in three subareas (OO / TT / VV). Within these three subareas, 57,700 LF of sewer and 380 sanitary manholes will be inspected for infiltration sources.
- 3. Database Development / Letter Report:** Data collected through the above investigations will be added to the existing Town database. The database will include sewer system information such as pipe lengths/diameters, street names and information from tasks performed as part of this study, such as sewer manhole investigation reports, and other pertinent information relating to the project. A letter report will prepared that details areas in which work was performed, summarizes work completed to date and includes recommendations, a cost-effectiveness analysis for rehabilitation of pipeline/manhole defects and I/I sources identified during this investigation. An opinion of probable rehabilitation design/construction cost will also be provided.
- 4. Rehabilitation Contract Documents:** Construction plans and specifications (to remove excessive I/I identified during this investigation) will be developed and submitted, followed by rehabilitation construction.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the Town of Dedham and Weston & Sampson Engineers, Inc. and the approved MWRA Phase 8 I/I Local Financial Assistance Project Application received April 22, 2013.

Total project cost is estimated at \$1,052,350. Eligible MWRA I/I Local Financial Assistance is \$473,000 (Year One Inflow Investigation = \$65,000 / Year One Infiltration Investigation = \$144,150 / Design & Bidding = \$50,000 / Rehabilitation Construction = \$213,850).

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

TOWN OF DEDHAM, MASSACHUSETTS  
I/I IDENTIFICATION AND REHABILITATION PROGRAM - YEAR ONE  
MWRA PROJECT NO. WRA-P8-12-3-811

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Year One Inflow Investigations	April 2013	June 2013
Year One Infiltration Investigations	April 2013	June 2013
Design/Bidding	June 2013	September 2013
Award Contract	September 2013	October 2013
Construction	October 2013	December 2013
Retesting	May 2014	June 2014

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF NORWOOD, MASSACHUSETTS  
HOYLE STREET AREA SEWER SYSTEM REHABILITATION  
MWRA PROJECT NO. WRA-P8-25-3-814**

**SCOPE OF SERVICES**

The Town of Norwood is continuing its efforts to reduce I/I and identify/eliminate sources of sewage contamination in its collection system and improve conveyance of wastewater. Prior investigations in the Meadowbrook area have identified both infiltration and inflow sources and deficiencies in the collection system affecting capacity. Coli sampling in the brook can be traced to the underdrain system that was constructed beneath the sanitary sewer in much of the downtown area of Norwood. Work under this project will be situated in the Hoyle Street area of downtown.

Many of the sewers in this area had been rehabilitated using various techniques. Two techniques were found to yield successful results: excavation/replacement and cured-in-place lining. Given the disruption associated with excavation and replacement in this downtown setting, it was recommended that the Town perform a comprehensive lining program to fully rehabilitate the mainline sewers and laterals in an effort to eliminate sources of exfiltration from the sewer system to the adjacent underdrain system. The rehabilitation will also eliminate groundwater infiltration into the sanitary sewer system.

Rehabilitation work under this project will consist of the installation of a cured-in-place liner in approximately two thousand, one hundred (2,100) liner feet of sewer, lining ten (10) sewer manholes and lining forty-five (45) house service connections. Project work will also include construction of five (5) additional underdrain access manholes in portions of the sewer system. These manholes will be used to perform additional sampling to pinpoint future rehabilitation efforts and monitor progress following corrective action. Given the differing nature of the two construction contracts, the work will be bid as two separate projects (rehabilitation and manholes); however, they will be bid and constructed concurrently.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Professional Services By and Between the Town of Norwood and CDM Smith, Inc. and the approved MWRA Phase 8 I/I Local Financial Assistance Project Application received April 29, 2013.

Total project cost is estimated at \$600,000. Eligible MWRA I/I Local Financial Assistance is \$600,000 (Design & Bidding = \$50,000 / Rehabilitation Construction = \$485,000 / Construction Services = \$65,000). As a result of the above work, an estimated 0.20 mgd of peak I/I will be removed from the collection system upon contract completion.

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

TOWN OF NORWOOD, MASSACHUSETTS  
HOYLE STREET AREA SEWER SYSTEM REHABILITATION  
MWRA PROJECT NO. WRA-P8-25-3-814

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	May 2013	June 2013
Construction	July 2013	September 2013

**MWRA II LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 8  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P8-43-3-813**

**CITY OF WOBURN**

**DESIGN, BID & AWARD, CONSTRUCTION OF THE MAIN STREET SANITARY  
SEWER REHABILITATION PROJECT**

**SCOPE OF SERVICES**

The sanitary sewer rehabilitation is to be performed in the following areas: Alfred Street, Border Street, Bradford Road, Bryant Street, Campbell Street, Commerce Way, Conn Street, Cross Street, Eaton Avenue, Fletcher Road, Green Street, Harold Avenue, Jefferson Avenue, Main Street, Mishawum Road, Pickering Street, Van Norden Road, and Wade Avenue.

The approximate scope of work includes but is not necessarily limited to: installation of 839 lf of sewers; installation of 12 sewer building connections; installation of 2 sewer manholes; 1,064 lf of temporary trench width pavement; 1,054 lf of permanent binder course and top course trench width pavement; cementitious lining of 400 vf of manholes; chemical root treatment of 796 lf of sewers; root treatment of 2 manholes; installation of 2,253 lf of cured-in-place pipe; installation of 2 cured-in-place lateral liners; installation of 122 lf of cured-in-place short liners; cleaning, inspection, testing and sealing of 1,132 lf of sewers; and other related tasks and appurtenances.

This project will also include the engineering services during the design, bid & award and construction which will include construction administration (office engineering) and resident engineering (field engineering).

**PROJECT COST SUMMARY**

<u>Description of Task</u>	<u>Estimated Cost</u>
Engineering Design, Bid & Award Services	\$ 59,900
Engineering Services During Construction	\$ 92,700
Construction of Sanitary Sewer Rehabilitations	\$ 780,700
<b>TOTAL ESTIMATED PROJECT COST</b>	<b><u>\$ 933,300</u></b>

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM – PHASE 8  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P8-43-3-813

CITY OF WOBURN

DESIGN, BID & AWARD, CONSTRUCTION OF THE MAIN STREET SANITARY  
SEWER REHABILITATION PROJECT

PROJECT SCHEDULE

<u>Milestone Description</u>	<u>Start Date</u>	<u>Completion Date</u>
Design of Sewer Rehabilitations	February 2013	April 2013
Bid & Award	May 2013	June 2013
Construction of Sewer Rehabilitations	June 2013	October 2013
Warranty Inspection & Retesting	March 2014	May 2014



ATTACHMENT 5  
TO  
MWRA ANNUAL I/I REDUCTION REPORT FOR FY13  
Reporting Period: July 2012 Through June 2013

**I/I REDUCTION STATUS UPDATE  
FOR MEMBER COMMUNITIES**

The MWRA is working cooperatively with member communities to develop phased I/I reduction programs throughout the service area. The Authority will encourage continuing community efforts in I/I reduction as detailed in the MWRA Regional I/I Reduction Plan. Many community I/I projects are funded through MWRA's I/I Local Financial Assistance Program. This \$300.75 million grant/loan program was established to provide funding to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Through FY13, MWRA has distributed \$249 million to fund local projects. A detailed update on MWRA's I/I Local Financial Assistance Program is included as Attachment 4 to this report.

The Authority has instituted a computer-based questionnaire format for communities to submit annual status reports on their I/I reduction programs. All 43 member sewer communities have submitted information to MWRA for FY13. Community information is summarized below:

**1. ARLINGTON: North System**

Background Information:

- Miles of Sewer: 106
- Sewered Population: 42,844
- Three Year ('10 - '12) Annual Average I/I: 2.46 mgd
- MassDEP Administrative Actions:     ACOP-NE-10-1N006 (August, 2010)  
  NON-NE-09-1N003 (July 2009)  
  NON-NE-07-1N004 (June 2007)

Latest I/I or SSES Reports:

- “Sewer System Investigation Area #6” Final Report (November 2011)
- “Kimball Road/MWRA Millbrook Valley Relief Sewer Evaluation” Final Report (November 2011)
- “Area #6 Smoke Testing, Dye Testing and Dye Flooding” Final Report (December 2011)
- “Town-wide I/I Analysis” Final Report (April 2012)
- “Additional Inspection of Sewer on Pond Lane, Academy St & Mystic Lake Drive” Letter Report (May 2012)
- “Area #6 (Kimball Road) Building Inspections” Report (January 2013)

Private Source Inflow Removal Program:

- The Area #6 Building Inspection Program, which was conducted in Fall 2012, identified 45 direct inflow sources.

I/I Rehabilitation Projects in Design or Construction:

- The Phase #3 Sanitary Sewer Rehabilitations – Bid No. 11-24 construction has been completed and the warranty inspection was completed in March 2013.
- The Phase #4 Sanitary Sewer Rehabilitations – Bid Item 12-07 construction reached substantial completion on April 30, 2013. This project is expected to be complete with warranty inspection by July 2014.
- The Phase #5 Sanitary Sewer Rehabilitations – Bid Item 12-46 construction reached substantial completion on June 21, 2013. This project is expected to be complete with warranty inspection by July 2014.

Reporting Period Activity:

- The Area #6 Building Inspection Program was conducted in Fall 2012. Inspections were performed at 958 of 1152 buildings. Direct Inflow sources were identified at 45 locations.
- The sewer rehabilitation completed as previously indicated includes: 4554 LF of 8 to 15-inch cured-in-place pipe liner; 500 LF of heavy cleaning; 3155 LF of root treatment; replacement of 5 sewer service connections; sealing & separating of 51 shared manholes; and lining of 66 sewer manholes.
- In February 2013, funds were distributed to fund the majority of the cost for the “Construction of the Phase 5 Sanitary Sewer Rehabilitations – Bid Invitation #12-46”. Rehabilitation of defects identified in the sewer system during the previous Area # 6 Sewer System Investigation Planning Program (SSIPP) Study is included in this project. The sewer rehabilitation work will mainly take place in Sewer Subareas 21, 40, 41, 45 & 50. The cost of the engineering services provided during the sewer rehabilitation is also included. The estimated Peak Inflow removal is 0.050 mgd and the peak Infiltration removal is 0.094 mgd. (MWRA Project No. WRA-P8-01-3-808).

MWRA I/I Local Financial Assistance Program: The community has financed nineteen (19) I/I reduction projects through the Authority’s funding assistance program. The Town has utilized all of the \$5,613,000 allotted through the Program’s Phases 1-8.

**2. ASHLAND: South System**

Background Information:

- Miles of Sewer: 66
- Sewered Population: 12,000
- Three Year (‘10 - ’12) Annual Average I/I: 0.40 mgd
- MassDEP Administrative Actions: No. 594 (November 1985)

Latest I/I or SSES Report: I/I Investigation/Repair (Summary Report): December 2010  
I/I Investigation/Repair (Summary Report): March 2012

Private Source Inflow Removal Program: Sump pump investigations by sub-basin during FY13:

Sub-Basin I: 52 inspections	Sub-Basin II: 173 inspections
Sub-Basin III: 54 inspections	Sub-Basin IV: 114 inspections

I/I Rehabilitation Projects in Design or Construction: The Town replaced 60 LF of collapsed/misaligned sewer pipe immediately upstream of the Brackett Road Pump Station (MWRA Project No. WRA-P6-02-3-632). Approximately 72,000 gpd of identified peak I/I removed. Also, the Town has contracted with National Water Main to line approximately 1760 LF of sewer pipe on Pleasant Street (MWRA Project No. WRA-P8-02-3-822). Work is scheduled to begin August 2013. Approximately 74,000 gpd of identified peak I/I will be removed.

Reporting Period Activity: West Union Street Transmission Sewer Replacement ongoing. This project will provide additional capacity for proposed development. The Jefferson at Ashland Station Development will add 6670 LF of 6-inch force main and 8-inch gravity sewer.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. The Town has utilized all of the \$1,328,500 allotted through the Program's Phases 1-8.

### **3. BEDFORD: North System**

Background Information:

- Miles of Sewer: 78
- Sewered Population: 13,150
- Three Year ('10 - '12) Annual Average I/I: 1.21 mgd
- MassDEP Administrative Actions: None
  
- Latest I/I or SSES Report: "Entegris Sewer Evaluation" Final Report dated January 2012

Private Source Inflow Removal Program: No additional inspections were reported this period.

In March 2010, Town Meeting voted to amend the Town's General Bylaws for Article 52 – Sewer System. This amendment includes a new Section 52.19 which allows authorized Town personnel to enter private properties to inspect internal plumbing. Under this bylaw amendment, the Town's Sewer System Bylaw now includes a 4:1 Inflow/Infiltration removal requirement for new developments that will generate greater than 50,000 gpd of new sanitary flows.

In November 2012, Entegris Inc paid the local I/I Mitigation fee of \$10 per gpd for 21,380 gallons. These funds are being used to investigate/mitigate I/I in the Page Road Sewer Pump Station area.

I/I Rehabilitation Projects in Design or Construction: The Phase II Sewer Rehabilitations – Bid Invitation No. 10-S1 was completed in January 2012. Repairs of defects found were completed during Summer 2012.

Additional sewer rehabilitations for the Phase II Sanitary Sewer Rehabilitations (Bid Invitation #10-S1) were conducted in April 2013. This project is now complete.

Reporting Period Activity: See "I/I Rehabilitation Projects in Design or Construction" section.

MWRA I/I Local Financial Assistance Program: The community has financed six (6) I/I reduction projects through the Authority's funding assistance program. Of the \$2,282,600 allotted through the Program's Phases 1-8, the community has \$591,000 remaining in funding assistance.

### **4. BELMONT: North System**

Background Information:

- Miles of Sewer: 78
- Sewered Population: 22,848
- Three Year ('10 - '12) Annual Average I/I: 1.64 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report:

- "I/I and Comprehensive Flow Monitoring Project" Final Report (July 2009)
- "Sewer System Evaluation Survey" Final Report (October 2009)
- "Preliminary Design Report – Investigations of Sewers to Identify I/I" Report (January 2013)

Private Source Inflow Removal Program: The Town continues to work with potential developers in implementing a program that either removes I/I at rate of 5 to 1 or makes a one time payment to the Town to fund community I/I removal work.

#### I/I Rehabilitation Projects in Design or Construction:

- Design of the CWSRF funded illicit connection mitigation project was completed. Bids were accepted and awarded on May 2, 2013. An estimated 26,300 gpd of infiltration is estimated to be removed. Construction is anticipated to be completed by January 2014.
- The Design of the Town-Wide Sewer Service Laterals & Mainline Sewer Rehabilitation Project was completed. Bids were accepted on April 17, 2013. The construction contract was awarded on June 19, 2013 and is anticipated to be completed by February 2014. An estimated 215,000gpd of I/I will be removed.
- The Sewer & Storm Drain Rehabilitation – Pavement Management Program construction contract was completed in November 2012. An estimated 1100 gpd of infiltration was removed.

#### Reporting Period Activity:

- Under the sewer rehabilitations contract previously indicated, approximately 4 miles of sanitary sewer has been lined in the last year.
- Trapelo Road CCTV inspection was conducted on 2250 LF of sanitary sewer pipe and 5890 LF of storm drain pipe. Pipes requiring immediate attention were incorporated into the CWSRF project. Remaining recommended rehabilitations will be incorporated into future construction projects.
- Approximately 14,600 LF of sewers and storm drains were CCTV inspected in support of Belmont's 2013 pavement management program. Pipes requiring immediate attention were incorporated into the CWSRF project (lining only). Remaining recommended rehabilitations will be incorporated into future construction projects.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$3,439,100 allotted through the Program's Phases 1-8, the community has \$447,000 remaining in funding assistance.

## 5. BOSTON: North and South Systems

#### Background Information:

- Miles of Sewer: 858
- Sewered Population: 619,914
- Three Year ('10 - '12) Annual Average I/I: 39.08 mgd
- MassDEP Administrative Actions: None (Cooperative agreement exists)

Boston North is one of MWRA's five combined sewer service communities (Boston North, Brookline, Cambridge, Chelsea, Somerville). Portions of Boston – North are impacted by projects under MWRA's CSO Control Plan.

Latest I/I or SSES Reports: Roxbury Canal Sewer Separation Study; Upper Neponset Valley Sewer Inflow Survey; Granite Avenue I/I Survey; Dorchester High Level Sewer I/I Survey; Lower Dorchester Brook Sewer Study; Longwood Medical Area I/I Survey; West Roxbury Low Level Sewer I/I Study

Private Source Inflow Removal Program: Since 1994, the Downspout Disconnection Program has conducted approximately 38,000 building surveys and 10,500 dye water tests. Approximately 23,050 downspouts have been disconnected. During CY05-CY13, a total of seventy-five (75) large impervious areas were surveyed to identify inflow sources. All seventy-five (75) areas have been dye tested.

I/I Rehabilitation Projects in Design or Construction: BWSC has both completed and is currently working on a wide variety of separation and I/I identification/rehabilitation projects. To date, seventy-eight (78) projects have received funding through the MWRA I/I Local Financial Assistance Program. During FY07-FY13, BWSC completed the following rehabilitation projects: Albany Street Sewer Separation, Sewer Rehabilitation in Dorchester/Mattapan/West Roxbury/Brighton, Talbot Avenue High Level Sewer Area Sewer Replacement/Manhole Rehabilitation, South End Sewer Rehabilitation, Marginal Street Sewer Separation, St. Botolph Street Sewer Separation, Maverick Street Sewer Separation, West Side Interceptor Lining, Back Street Sewer Separation, Chester Park Area Sewer Separation and East Boston (Border/Meridian Streets) Sewer Separation. On-going rehabilitation projects include: Mass Ave – Roxbury Separation

(New Market Square), Mass Ave – Dorchester Separation (New Market Square Area), Dudley Square Sewer Separation, and Rehabilitation of Sewers in the Fenway (Audubon Circle/St. Mary's Street Area).

BWSC is also working with the Boston University Medical Center Facilities Management Group on I/I mitigation projects to offset sanitary discharges from Boston University's National Emerging Infectious Diseases BioSquare Phase II Project (620 Albany Street).

BWSC entered into an I/I reduction agreement with the Massachusetts DEP in January 1986. As provided in the agreement, BWSC has performed a Phase II SSES on separated sewer areas within the City. BWSC also has an ongoing tide gate/regulator inspection and repair program and performs separation projects on pockets of combined sewers tributary to separated sewer areas.

Reporting Period Activity: BWSC is required to report to the EPA on I/I reduction measures under their NPDES permit. This reporting requirement coincides with the MWRA's required submittal dates; therefore, please refer to the BWSC NPDES report for a summary of activities during this period.

MWRA I/I Local Financial Assistance Program: The community has financed seventy-eight (78) I/I identification/reduction projects through the Authority's funding assistance program. Of the \$85,585,200 allotted through the Program's Phases 1-8, the community has \$4,943,624 remaining in funding assistance.

## **6. BRAINTREE: South System**

Background Information:

- Miles of Sewer: 140
- Sewered Population: 33,882
- Three Year ('10 - '12) Annual Average I/I: 3.35 mgd
- MassDEP Administrative Actions: ACO-NE-01-1001 (April 2001)  
ACO-NE-99-1001 (March 1999)  
NON (May 1997)  
NON (October 1986)  
Amended AO Docket No. 546 (February 1985)

Latest I/I or SSES Report: Annual Town-Wide Sewer Investigation & Rehabilitation Program –  
Prioritization Evaluation Report (July 2011)  
Annual Town-Wide Sewer Program – Yr 1 Investigation (July 2012)  
Annual Town-Wide Sewer Program – Yr 2 Investigation (Spring 2013)

Private Source Inflow Removal Program: Sump pump removal program is ongoing. Ten (10) private source sump pump removal contracts have redirected 295 sump pumps to date. Developer Flow Reduction Program is now 6 to 1 per DEP ACO.

I/I Rehabilitation Projects in Design or Construction: Annual Town-Wide Sewer Program (Year 1 Investigation / MWRA Project No. WRA-P7-06-3-748) performed TV inspection of 49,538 LF of sewer pipe in Subareas S1 / W2 / HC2 / M2 and revealed an estimated 43,632 gpd of peak infiltration. Topside manhole inspection of 230 manholes in Subareas S1 / W2 revealed an estimated 35,795 gpd of peak infiltration. Annual Town-Wide Sewer Program (Year 2 Investigation / MWRA Project No. WRA-P8-06-3-812) performed flow isolation TV inspection and topside manhole inspection during Spring 2013. The inspection data review/reporting is ongoing. An annual flow monitoring project is also ongoing. Reports will be provided on a quarterly basis.

Reporting Period Activity: Annual Town-Wide Sewer Program (Year 1 Design / MWRA Project No. WRA-P7-06-3-748) was completed May 2013. The rehabilitation construction project has been awarded and is expected to begin Summer 2013. Jefferson Street Pump Station Rehabilitation completed. Lenox Farms Subdivision (41 buildings) completed.

MWRA I/I Local Financial Assistance Program: The community has financed seven (7) I/I reduction projects through the Authority's funding assistance program. Of the \$5,319,000 allotted through the Program's Phases 1-8, the community has \$1,893,200 remaining in funding assistance.

## 7. BROOKLINE: North and South Systems

### Background Information:

- Miles of Sewer: 111
- Sewered Population: 54,786
- Three Year ('10 - '12) Annual Average I/I: 5.72 mgd
- MassDEP Administrative Actions: None

Brookline is one of MWRA's five combined sewer service communities (Boston North, Brookline, Cambridge, Chelsea, Somerville). Portions of Brookline are impacted by projects under MWRA's CSO Control Plan.

### Latest I/I or SSES Report:

- "Sewer Evaluation Survey in Subareas NI-7, 8 & 12" Final Report (May 2012)
- "Results for Condition Survey – Subareas NI-7, NI-8 & NI-12" Technical Memo (August 2012)
- "Eliot Street Smoke Testing" Technical Memo (January 2013)
- "Englewood Ave/Kilsyth Rd Sewer Alternative Evaluation" Technical Memo (February 2013)

Private Source Inflow Removal Program: Town is in the process of developing a Private Flow Source Identification and Removal Program. A 4:1 Flow Reduction is enforced for large residential and commercial projects. The community is continuing its public outreach for private inflow identification/removal. Engineering Division personnel are on the lookout for illicit sump pumps during inspections. None were found to be connected to the sewer this year.

### I/I Rehabilitation Projects in Design or Construction:

- Construction began in Winter/Spring 2011 on the Phase 2 Lower Beacon Street Sewer Separation Project. The following work has been completed: the lining of 140 LF of 48-inch sewer under the MBTA tracks on Beacon Street at Carlton Street; the installations of 12-inch sewer and 30-inch storm drains in St Mary's Street from Beacon Street to Monmouth Street; a 15-inch drain on Monmouth Court and 18-inch and 24-inch drains in Monmouth Street. The epoxy lining and water proofing of Special Structures 3, 4 and 5 has also been completed. In addition, the contractor commenced the installation of 8-inch sewer and 24-inch drain on Beacon Street from St. Mary's Street to Carlton Street and the excavation, demolition and placement of form-work for the cast in-place Special Structure 6 on Beacon Street immediately east of the St. Paul intersection. This project is 99% complete. The remaining work consists of surface restoration including, paving, sidewalk reconstruction and punch list items.
- The design of the recommended sewer rehabilitations per the I/I investigations conducted in NI-7, 8 and 12 was completed ("Sewer System Rehabilitations – Contract No. PW/12-34"). Bids were accepted on March 7, 2013. The construction contract was awarded on April 16, 2013 and construction has commenced.
- The design of the recommended sewer rehabilitations per the sewer investigations conducted on Englewood and Kilsyth Streets was completed ("Various Sewer and Drain Improvements – Contract No. PW/13-14"). Bids were accepted on March 7, 2013. The construction contract was awarded on April 16, 2013. Work began in July 2013. The 18-inch Beacon Street sewer has been repaired and will be rehabilitated with CIPP under Contract PW/12-34.

### Reporting Period Activity:

- Approximately 315 LF of 15-inch diameter sewer was installed on Englewood Avenue to help alleviate the surcharging of the sewer in this area.
- In June 2013, funds were distributed for the following two (2) sewer rehabilitation contracts: (1) Contract No. PW/12-34: Sewer Rehabilitations; and (2) Contract No. PW/13-14: Various Sewer and Drain Improvements (sewer portion only). The estimated peak I/I to be removed is 0/174 mgd (MWRA Project No. WRA-P8-07-3-815).

MWRA I/I Local Financial Assistance Program: The community has financed seven (7) I/I reduction projects through the Authority's funding assistance program. Of the \$8,605,200 allotted through the Program's Phases 1-8, the community has \$3,078,800 remaining in funding assistance.

## 8. BURLINGTON: North System

### Background Information:

- Miles of Sewer: 115
- Sewered Population: 24,735
- Three Year ('10 - '12) Annual Average I/I: 1.58 mgd
- MassDEP Administrative Actions: ACO-NE-06-1N001 (March 2006)  
ACO-NE-01-1004 (July 2001)  
Amended AO Docket No. 618 (October 1986)

### Latest I/I or SSES Reports:

“Easement Manhole Inspections & Flood Plain Manhole Inflow Investigations” Final Report (August 2011)

“Phase 5 Smoke Testing, Dye Testing & Dye Flooding” Final Report (January 2012)

“Phase 5 Sanitary Sewer Flow Evaluation and Recommendations” Final Report (January 2012)

“Phase 6 Sewer System Evaluation Survey” Final Report (January 2012)

“Building Inspections in the Phase 6 Area” Final Report (June 2012)

### Private Source Inflow Removal Program:

The Town hired a consultant to perform building inspections for private sources of inflow at residential properties, as part of the Project 7 Building Inspections. Under this project, inspection will be attempted at as many as 3200 residential properties.

In the past year, developers have redirected 16 private illicit sump pumps for an estimated inflow removal of 19,200 gpd.

The formal sewer bank request in the amount of 143,260 gpd that was submitted to MassDEP was approved.

### I/I Rehabilitation Projects in Design or Construction:

The warranty retesting and final inspection of the Phase 5 Sanitary Sewer Rehabilitations (Contract No. SW-11-1140) was completed on March 11, 2013.

The design and construction of “Gravity Sewer Rehabilitations Downstream of Force Main Discharge Locations” will be completed in the Summer 2013.

### Reporting Period Activity:

- Heavy cleaning of 758 LF of sewer is scheduled to be completed as part of the Project 7 Sewer System Evaluation Survey Study.
- In February 2013, funds were distributed for the four (4) following projects: (1) Sewer System Evaluation Survey in Specific Areas; (2) Evaluation & Comparison of Sewer Flows @ Pump Stations with Water Use Data; (3) Evaluation of Manholes in Localized Flooding Areas; and (4) Building Inspection Program in Specific Areas (MWRA Project No. WRA-P8-08-2-809).

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I reduction projects through the Authority’s funding assistance program. Of the \$3,304,800 allotted through the Program’s Phases 1-8, the community has \$19,000 remaining in funding assistance.

## 9. CAMBRIDGE: North System

### Background Information:

- Miles of Sewer: 148
- Sewered Population: 105,490
- Three Year ('10 - '12) Annual Average I/I: 6.32 mgd
- MassDEP Administrative Actions:     NON-NE-00-1012 (May 2000)  
  NON-NE-00-1004 (January 2000)  
  ACOP-NE-96-1004

Cambridge is one of MWRA's five combined sewer service communities (Boston North, Brookline, Cambridge, Chelsea, Somerville). Portions of Cambridge are impacted by projects under MWRA's CSO Control Plan.

Latest I/I or SSES Report: Phase II: Analysis and Fast Track Design of I/I Rehabilitation Projects (December 2007)

### Private Source Inflow Removal Program:

Four (4) building have been inspected to date as part of the Concord Avenue Contract 9 Project.

In the past year, DPW instituted a dedicated budget code within the Capital Budget for I/I offset fees. Per the Department of Environmental Protection/Bureau of Resources Protection 2009 I/I Policy, new development projects that cannot remove 4 gallons of I/I per gallon of new sewer flow are charged a mitigation fee which goes to the fund. The fees collected are used by the DPW to remove I/I at other City projects.

### I/I Rehabilitation Projects in Design or Construction:

- The CAM017 Bending Weir project (CSO regulator modification) – This project is part of the Bishop Allen Stormwater Management Project CAM017. The City began work on the CSO regulator modification and bending weir in February 2012. In the past year, 150 LF of new 72-inch storm drain was installed in Binney Street. The existing flap valve on Land Boulevard was rehabilitated. Three new bending weirs have been installed. Remaining work includes installation of the MWRA and City CSO meters and surface restoration. The project is expected to be completed by October 2013.
- Forest Street Project Upper Oxford Street Side Streets – Sewer Separation and Stormwater Management – The second phase of this project includes sewer separation on Forest Street and is complete. A total of 2455 LF of new storm drain and 2050 LF of new sewer pipe were installed as part of this project.
- Western Avenue Reconstruction Project - In the past year, the City's Contractor has completed the construction of a new storm water outfall on the Charles River for the new Western Ave storm drain. The Contractor has completed the installation of over 1200 LF of new 36-inch storm drain to date. Remaining work includes installation of the rest of the new storm drain, replacement or rehabilitation of sewer line, construction of a storm water deflection structure and a storm water sampling station.
- The design for the Common Manhole Removal Project Contract No. 7 was completed and the contract has been bid and awarded. The Contractor to date has removed 4 (four) common manholes on Emily Street and Tudor Street. DPW performed an analysis of the potential peak hourly and average annual I/I removal for this project. Estimated peak hourly I/I removal is 6.20 mgd. Estimated average annual I/I removal is 0.0356 mgd. The remaining 28 common manholes are scheduled to be removed by the end of 2013.

### Reporting Period Activity:

- The developer of 223 Concord Turnpike has begun work to install a new storm water detention system. The developer has completed the installation of a sewer holding tank for use during CSO events.
- Remedial Sewer Repair: In the past year, the City's Contractor installed 629 LF of new 24-inch storm drain on Scott Street between Kirkland and Holden Streets. The Contractor also installed 489 LF of new 12-inch sewer, replacing existing, and 361 LF of new 12-inch storm drain on Mercer Circle.



- Myrtle Magnolia Project – Construction for this project began in 2012. Work includes construction of new storm water holding tank and new pump station. To date, the City’s Contractor has installed more than 1700 LF of new storm drain and has replaced or installed more than 750 LF of sewer. More than 700 LF of combined sewer have been abandoned. The holding tank, diversion structure and the pump station structures have been installed. Remaining work includes completion of the pump station and surface restoration. The project is expected to be completed by the end of November 2013.
- CAM004 Contract 8A Huron Ave – Construction for this project began in 2012. Work will include the removal of 4 common manholes along with sewer separation. To date, 700 LF of new storm drain and 4900 LF of new sewer replacing existing sewer have been installed. The project is expected to be completed by May 2014.
- CAM004 Contract 8B Huron Ave – This project has just been bid, The City is in the process of awarding the Contract. Work will include the removal of 10 common manholes along with sewer separation. The subsurface work for the project is expected to be completed by December 2015.
- CAM 004 Contract 9 Concord Avenue – This project is in the design phase. Work will include the removal of 12 common manholes along with sewer separation. The sub-surface work for the project is expected to be completed by December 2015.
- In February 2013, funds were distributed for the “Construction of Common Manhole Removal Contract #7”. This project involves the work associated with the separation of the remaining 34 common manholes located throughout the City. The specific locations and number of common manholes are: Murray Hill Road (3); Bay Street (1); Green Street (1); Franklin Street (2); Tudor Street (1); Decatur street (2); Anglim Street (1); Emily Street (1); Valentine Street (3); Speridakes Terrace (2); Hamilton Street (1); Main Street (3); MIT near Amherst Alley (4); MIT near Memorial Drive (2); U.S. Department of Transportation Volpe Center (4); Harvard University near Fernald Drive (2); and Harvard University near Memorial Drive (1). The estimated inflow to be removed by this project is 0.0356 mgd annually (MWRA Project No. WRA-P8-09-3-810).

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority’s funding assistance program. Of the \$15,566,100 allotted through the Program’s Phases 1-8, the community has \$4,489,045 remaining in funding assistance.

## 10. CANTON: South System

Background Information:

- Miles of Sewer: 62
- Sewered Population: 14,552
- Three Year (‘10 - ‘12) Annual Average I/I: 1.19 mgd
- MassDEP Administrative Actions: AO Docket No. 537 (April 1984)

Latest I/I or SSES Report: Comprehensive Water Resources Management Plan (February 2009)  
I/I Five Year Management Plan (November 2011)

Private Source Inflow Removal Program: No additional inspections were reported during this period. Town has established an I/I Mitigation Fee for all new connections. Fee is paid based upon DEP flow rates at a 4 to 1 ratio.

I/I Rehabilitation Projects in Design or Construction: Sewer System Rehabilitation (Contract No. 12-01S / MWRA Project No. WRA-P8-10-3-817) began July 2013. Project work includes sewer manhole sealing/restoration, sewer pipe testing and sealing, CIPP lining and joint testing/sealing in various sewer subsystems throughout the Town. Project work is scheduled to be completed in Fall 2013.

Reporting Period Activity: The Town conducted a 12 week flow metering program within Subsystems 7/9/12/14/16/18/19/24 to identify areas with extraneous flows. Town-wide CCTV inspection program is complete.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority’s funding assistance program. Of the \$2,675,900 allotted through the Program’s Phases 1-8, the community has \$1,030,000 remaining in funding assistance.

## 11. CHELSEA: North System

### Background Information:

- Miles of Sewer: 41
- Sewered Population: 41,577
- Three Year ('10 - '12) Annual Average I/I: 2.24 mgd
- MassDEP Administrative Actions: None
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-008 (March 2009)

Chelsea is one of MWRA's five combined sewer service communities (Boston North, Brookline, Cambridge, Chelsea, Somerville). Portions of Chelsea are impacted by projects under MWRA's CSO Control Plan.

Latest I/I or SSES Report: Investigation into Excessive Infiltration/Inflow & Exfiltration (November 2010)

### Private Source Inflow Removal Program:

The City began collecting Sewer Bank fees for redevelopment projects in 2013. The City has also begun a move toward the implementation of Green vs. Gray infrastructure to reduce the amount of stormwater discharged to combined sewers. Efforts to date have included requiring all redevelopment projects to utilize Low Impact Development and retain/infiltrate stormwater onsite, and incorporating green infrastructure into municipal projects (e.g., rain garden at Mace Housing Complex).

### I/I Rehabilitation Projects in Design or Construction:

- Construction of the Washington Avenue Utility & Infrastructure Improvements Project was completed in November 2012. This project involved the replacement of approx. 3,500 LF of combined sewer on Washington St between Heard Street & Revere Beach Parkway with new separate sanitary sewer and storm drain.
- Construction of sewer replacement on Carter Street was completed December 2012. This project included replacement of approximately 750 LF of existing sewer on Everett Avenue and Carter Street. It also included cured-in-place lining of approximately 540 LF of sewer on Webster Avenue and crossing under Revere Beach Parkway.
- Construction of Chelsea's One North Utility Improvements (formerly Crescent Urban Renewal Area Utility Improvements) project is currently on-going and is anticipated to be completed in the Fall 2013. The project includes upgrades to utilities on Heard and Sixth Streets between Maple and Spruce, Maple Street from Heard to Sixth, and on Spruce Street between Blossom and the Sixth Street. This includes approximately 2500 LF of water main improvements and comprehensive sewer separation throughout the project area (approximately 1100 LF of sewer and 2000 LF of drain); however, separated flow will temporarily be returned to the combined sewer on Spruce Street until such time as required sewer and drain pipe jackings can be completed under the MBCR rail lines.
- Preliminary design for the Broadway Infrastructure Project began in the Spring 2013, and is anticipated to reach approximately 50% design by October 2013 and 75% by February 2014 for submission to the MassDOT Transportation Improvement Program (TIP) for funding. If TIP funding is to be utilized, construction of the project may not begin for several years. This project consists of upgrades to utilities throughout the project area, including approx. 5000 LF of full sewer separation.
- Design of the Spruce Street Infrastructure Improvements project is ongoing. The project consists of utility improvements on Spruce Street from Sixth to Beech, including the sewer and drain pipe jackings under the MBCR rail lines to complete the sewer separation effort currently ongoing in the upstream "One North" tributary area. It also includes utility improvements on Beech Street between Maple and Spruce Street in support of anticipated development.
- Bidding is complete for construction of the Lash, Gardner, and John Street Utility & Roadway Improvements project. The project includes comprehensive infrastructure improvements the full length of Lash Street and John Street, and on Gardner between John and Parker. It includes replacement of approximately 1050 LF of aging sewer pipe and installation of approximately 780 LF of new drain.

- Design is ongoing for the Lower Broadway Water Main and Drainage Improvements project. The project will include installation of approx. 600 LF of drain line on Broadway, between Beacon Street and Medford Street, to allow sewer separation. It will also include redirection of a few catch basins from the sewer to the new drain, as well as elimination of Combined Sewer Overflow CHE002.
- The City also performed point repairs at 15 separate locations.

Reporting Period Activity: See above work description.

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I reduction projects through the Authority's funding assistance program. Of the \$4,232,100 allotted through the Program's Phases 1-8, the community has \$627,000 remaining in funding assistance.

## **12. DEDHAM: South System**

Background Information:

- Miles of Sewer: 95
- Sewered Population: 23,645
- Three Year ('10 - '12) Annual Average I/I: 1.85 mgd
- MassDEP Administrative Actions: AO Docket No. 547 (October 1985)

Latest I/I or SSES Report: Town-Wide Flow Monitoring (October 2011)  
 Municipal Building Inspections (October 2012)  
 2012 Inflow Investigation (February 2013)  
 I/I Investigation & Rehabilitation Annual Program (February 2013)

Private Source Inflow Removal Program: The Town adopted a sewer system enterprise fund at the May 2009 Town Meeting. A Municipal Buildings Inspection Program was undertaken to identify inflow sources. Inspections identified approximately 1200 GPD of peak inflow that will be removed by the Town this year.

I/I Rehabilitation Projects in Design or Construction: The Town, as part of the 2012 on-call sewer repairs project (MWRA Project Nos. WRA-P8-12-3-811), completed the installation of 7765 LF of CIPP lining, 260 LF of short liners and 27 VF of cementitious manhole lining. The project removed an estimated 0.12 mgd of peak infiltration.

The community also continued its annual sewer system inspection program. Between April 2013 and May 2013, the Town cleaned and inspected 57,658 LF of sewer main and inspected 212 sewer manholes. The Town plans to utilize this data to perform additional rehabilitation on the most cost-effective sewer lines/ manholes in the Summer/Fall 2013 utilizing an on-call contract.

Reporting Period Activity: Approximately 4050 LF of sewer main extensions were installed throughout the Town by private developers. Upon completion of the extension projects, the Town took over ownership of the sewer mains.

MWRA I/I Local Financial Assistance Program: The community has financed fourteen (14) I/I reduction projects through the Authority's funding assistance program. The Town has utilized all of the \$3,914,000 allotted through the Program's Phases 1-8.

## **13. EVERETT: North System**

Background Information:

- Miles of Sewer: 57
- Sewered Population: 37,353
- Three Year ('10 - '12) Annual Average I/I: 1.96 mgd
- MassDEP Administrative Actions: ACOP-NE-08-1N006 (July 2008)
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-026 (August 2009)

Latest I/I or SSES Report:

Sanitary Sewer Overflow Abatement Plan – Behan & Beacham Street Area Final Report (December 2009)

I/I Investigation (July 2010)

Sanitary Sewer/Drain Investigation on Beacham Street (August 2012)

Private Source Inflow Removal Program:

- No additional inspections were reported during this period.
- Developer for the development off Air Force Road is being required to assume the cost of I/I mitigation (37,500 gpd) to offset the proposed wastewater flows associated with the project. The developer has been given specific areas to complete the required mitigation.

I/I Rehabilitation Projects in Design or Construction:

- Behan/Beacham Street Sewer Replacement Project has been completed. This project is in compliance with Mass DEP Administrative Order NE-08-1N006. Funding was provided under the State SRF Program.

Reporting Period Activity: See above description of work.

I/I investigation of the sewers in the Otis Street & Henderson Street area is being conducted.

Internal TV inspection and evaluation of the sewer in the Beacham Street extension from Behan Street to Broadway is being conducted.

MWRA I/I Local Financial Assistance Program: The community has financed six (6) I/I reduction projects through the Authority's funding assistance program. Of the \$5,229,500 allotted through the Program's Phases 1-8, the community has \$2,088,000 remaining in funding assistance.

## **14. FRAMINGHAM: South System**

Background Information:

- Miles of Sewer: 275
- Sewered Population: 60,148
- Three Year ('10 - '12) Annual Average I/I: 2.12 mgd
- MassDEP Administrative Actions: ACO-NE-07-1N001 (March 2007)  
AO Docket No. 592 (January 1986)

Latest I/I or SSES Report: Town-Wide I/I Study / SSES Phase 1 / CWMP (Complete)  
SSES Phase 2 (Complete); SSES Phase 3 (Complete)  
SSES Phase 4/5 (Complete; Blackberry Lane SSES (Complete)

Private Source Inflow Removal Program: As part of the Phase 4/5 SSES project, up to 800 homes/businesses were targeted for inspection in Subareas F / FF / S / T and H / I / Y during Summer/Fall 2011. In addition the Phase 4 SSES project performed approximately 90 dye tests to confirm potential connections observed in the Phase I / II / III inspections. The Town has completed a comprehensive assessment of the five phases of SSES programs. The Town is currently developing capital projects that will incorporate the removal of the illicit connections identified during the field reconnaissance efforts of the SSES programs. The capital project program will include the redirection of illicit flows as well as the extension of storm drain systems to remove the flow from the sewer system. A firm schedule has not been developed for project implementation.

I/I Rehabilitation Projects in Design or Construction: The Central Street Siphon / Sudbury River Interceptor Project consisted of lining 4000 LF of 18-inch sewer in a wetland area of the Sudbury River and the replacement of 4000 LF of 8-inch sewer with an 18-inch interceptor. The new configuration eliminates two siphons under the Sudbury River and will eliminate a bottleneck that has generated a seasonal sanitary sewer overflow. The project was completed Fall 2012.

The Coburn Street Area Sewer Rehabilitation Project (Contract PW 191 / MWRA Project No. P7-14-3-745) included the replacement of 5000 LF of sewer and CIP lining of 1200 LF of 8-inch sewer. The project was completed Summer 2012. A smaller second project is proposed for later this year to upgrade a small portion of the water/sewer system in an adjacent area of the Town. This is proposed work is scheduled to be completed in 2014.

The Downtown Utilities Improvements Project began May 2012. The project will upgrade the water/sewer systems in anticipation of a roadway improvement project. Approximately 1000 LF of sewer will receive lining and another 320 LF of sewer will be replaced. Project work was completed November 2012.

The East Framingham Sewer Improvements Project was completed late 2012. The project included the replacement of 17,000 LF of sewer and the elimination of three wastewater pumping stations and 15,000 LF feet of force main.

The Town commenced the Concord and School Street Sewer Project. The project involves sewer reconfiguration to allow the Saxonville Pumping Station to be eliminated and all sewer flows from this area of Town to be pumped through the newly completed A Street Wastewater Management Facility. This project involves approximately 1000 LF of sewer replacement under a levee system and through the Sudbury River. Project work is scheduled to be completed by the end of 2013.

Reporting Period Activity: The Vaillencourt / Lakeview Pumping Station Elimination and Chouteau LaSalle Avenue Water Main Replacement Project work was completed November 2012. The project involved the elimination of two wastewater pumping stations and replacement of 1000 LF of sewer.

The Eaton / Chalis / Nob Hill Pumping Stations Replacement Project began construction during Summer 2012. It involves the elimination of a sewer pumping station and replacement of 5000 LF of sewer. Project work is scheduled to be completed by October 2013.

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I reduction projects through the Authority's funding assistance program. Of the \$8,025,000 allotted through the Program's Phases 1-8, the community has \$3,022,000 remaining in funding assistance.

## **15. HINGHAM: South System**

Background Information:

- Miles of Sewer: 33
- Sewered Population: 6,958
- Three Year ('10 - '12) Annual Average I/I: 0.85 mgd
- MassDEP Administrative Actions: AO Docket No. 536 (November 1985)

Latest I/I or SSES Report: Manhole Inspection Report (August 2008)  
Comprehensive Wastewater Management Study (August 2010)  
I/I Investigations Letter Report (June 2012)

Private Source Inflow Removal Program: The house-to-house sump pump inspection and roof leader disconnection programs in the Downtown area are ongoing. Lateral camera inspections were undertaken within the Bradley Woods area.

I/I Rehabilitation Projects in Design or Construction: Manhole and mainline sewer inspections were undertaken within the community's Downtown and Crow Point areas. The Town will use Developer Flow Reduction Program funds (4 to 1 removal @ \$2.67/gallon) to identify and remove I/I sources.

Reporting Period Activity: Construction of sewer extensions for Ship Street and Cottage Street is being reviewed. Sewer extensions into the South Shore Industrial Park are planned. The Town is planning to seal and abandon five sewer outfall discharge pipes. A portion of Central Street was sewered between Elm and South Streets.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$1,032,500 allotted through the Program's Phases 1-8, the community has \$443,000 remaining in funding assistance.

## 16. HOLBROOK: South System

### Background Information:

- Miles of Sewer: 31
- Sewered Population: 9,237
- Three Year ('10 - '12) Annual Average I/I: 0.30 mgd
- MassDEP Administrative Actions: ACO-NE-04-1001  
(Signed January 2005; Amended July 2007)  
(Amended ACO No. 2 May 2008)

Latest I/I or SSES Report: I/I Inspections Report (July 2006); DEP ACO Progress Report (June 2008);  
CWSRF No. 2919 Contract No. 1 (October 2009)

Private Source Inflow Removal Program: House-to-House inspections continue. All new home construction inspected by the DPW and Town Plumbing Inspector. The State has approved the Town's Sewer Bank Policy.

I/I Rehabilitation Projects in Design or Construction: TV inspection was conducted on 10,500 LF of sewer in Sub-areas H(7) and H(8). Manholes inspections (300 total) were conducted primarily in Sub-areas A/F/G/H(8).

Reporting Period Activity: The Town has completed its yearly check of all cross-country sewer manholes. Phase 3/4 properties associated with collection system expansion are now being connected at owner's request. Phase 5 system extension (Spring Street) is under design and scheduled to be bid Summer 2013.

MWRA I/I Local Financial Assistance Program: The community has financed two (2) I/I reduction projects through the Authority's funding assistance program. Of the \$1,059,600 allotted through the Program's Phases 1-8, the community has \$163,038 remaining in funding assistance.

## 17. LEXINGTON: North System

### Background Information:

- Miles of Sewer: 170
- Sewered Population: 29,334
- Three Year ('10 - '12) Annual Average I/I: 3.03 mgd
- MassDEP Administrative Actions: ACO-NE-11-015 (July 2011)

### Latest I/I or SSES Reports:

Annual Town-wide Sewer Investigation & Implementation Program Final Report (October 2011)

Sewer Basins 3, 9 & 10 Smoke Testing, Dye Testing & Dye Flooding Program Final Report (January 2012)

Sewer Use Code Review Final Report (February 2012)

Private Inflow Removal Program Final Letter Report (February 2012)

Sewer System Evaluation Survey – Phase III Final Report (April 2012)

Surcharged Areas Evaluation Final Report (April 2012)

Sewer System Evaluation Survey Phase 4: Sewer Basins 3 & 9 (May 2013)

### Private Source Inflow Removal Program:

- The town is using the February 2012 *Sewer Use Code Review* to update their current regulations to incorporate a sewer bank or other funding options that may be adopted by the town.

- The town is currently discussing the potential to adopt a private inflow program from the February 2012 Private Inflow Removal Program Letter Report.

I/I Rehabilitation Projects in Design or Construction:

- Warranty re-inspections for Contract No. 10-29 & Contract No. 11-24 were completed in May 2012. All final paperwork has been processed.
- Warranty re-inspection for the “2012 Wastewater System Improvements (Contract No. 12-46)” was performed in May/June 2013. All final paperwork is being processed and is expected to be completed by August 2013.
- Construction of Marrett Road Sewer Improvements - Contract 13-07 began in September 2012 and was substantially complete in December 2012. Final paving was completed in June 2013.

Reporting Period Activity:

- See “I/I Rehabilitation Projects in Design or Construction” Item above.
- The Phase 4 SSES Report which includes investigations in Sewer Basins 3/9 was completed in May 2013. The Town anticipates beginning a design, bid and award of the recommended repairs in the Summer/Fall 2013.

MWRA I/I Local Financial Assistance Program: The community has financed seven (7) I/I reduction projects through the Authority’s funding assistance program. Of the \$4,835,300 allotted through the Program’s Phases 1-8, the community has \$676,000 remaining in funding assistance.

## 18. MALDEN: North System

Background Information:

- Miles of Sewer: 100
- Sewered Population: 55,541
- Three Year (‘10 - ‘12) Annual Average I/I: 4.10 mgd
- MassDEP Administrative Actions: None
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-002 (January 2009)

Latest I/I or SSES Report:

“Malden Sewer System Evaluation Survey (Phase III)” Final Report (December 2011)

“Hydraulic Model and Capacity Assessment Draft Report (June 2012)

Private Source Inflow Removal Program: No additional inspections were reported.

I/I Rehabilitation Projects in Design or Construction: No sewer rehabilitation projects were designed or constructed during this period.

Reporting Period Activity:

- Since the last Annual I/I Questionnaire submitted in August 2012, the City has continued with further characterizing its wastewater collection system including performing miscellaneous field investigations and provide updates to sewer system mapping and GIS.
- In 2012, the City submitted a Project Evaluation Form (PEF) to secure a State Revolving Fund (SRF) loan to complete wastewater system improvements as recommended in the 2010 issued Phase III SSES report and beyond. The final SRF CW 2013 Intended Use Plan (IUP) was issued on June 14, 2013 reflecting a \$5,000,000 loan approval for the wastewater system improvements as reflected in the PEF. The City has contracted CDM Smith to provide design services to develop contract documents for the Phase III SSES recommended improvement. Design has commenced and construction is expected to start sometime in late 2013/early 2014. This work is estimated to remove approximately 250,000 GPD of extraneous flow from entering Malden’s wastewater

collection system. The City is also intending to perform additional field investigations that included closed circuit television inspection over the coming months.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$7,825,900 allotted through the Program's Phases 1-8, the community has \$3,232,000 remaining in funding assistance.

## **19. MEDFORD: North System**

Background Information:

- Miles of Sewer: 113
- Sewered Population: 55,517
- Three Year ('10 - '12) Annual Average I/I: 3.58 mgd
- MassDEP Administrative Actions: NON-NE-00-1005
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-027 (August 2009)

Latest I/I or SSES Report:

"Limited Sewer System Evaluation Survey of North Medford/Heights Area" Final Report (July 2012)

Mini-System "P" Sewer System Evaluation Survey Study Draft Report (March 2013)

Private Source Inflow Removal Program:

A City-wide policy to disconnect sump pumps is being developed as part of the follow-up activities.

The Mini-System "P" Sewer System Evaluation Survey Study has a component to inspect at least 20% of the homes in the tributary area.

I/I Rehabilitation Projects in Design or Construction:

In August 2012, the design of the sewer rehabilitations as recommended by the "Limited Sewer System Evaluation Survey of North Medford/Heights Area" Final Report commenced. The Contract Documents are undergoing final review with the advertisement for bids expected in August 2013.

Reporting Period Activity:

The MWRA comments on the "Limited Sewer System Evaluation Survey of North Medford/Heights Area" Report were addressed and the Final Report was approved by MWRA on July 25, 2012

MWRA I/I Local Financial Assistance Program: The community has financed seven (7) I/I reduction projects through the Authority's funding assistance program. Of the \$7,961,600 allotted through the Program's Phases 1-8, the community has \$3,167,000 remaining in funding assistance.

## **20. MELROSE: North System**

Background Information:

- Miles of Sewer: 74
- Sewered Population: 26,681
- Three Year ('10 - '12) Annual Average I/I: 2.51 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: I/I Rehabilitation Project Recommendations (November 2001)

Private Source Inflow Removal Program: No inspections were reported during this period.



I/I Rehabilitation Projects in Design or Construction:

- No projects are currently being designed or constructed.

Reporting Period Activity:

- As of July 2013, the City has hired a consultant to compile a summary of all I/I rehabilitation projects completed over the past 5–10 years and to prepare a summary report of recommendations to the sewer system for I/I related projects over the next 1 to 3 years.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$3,913,300 allotted through the Program's Phases 1-8, the community has \$1,069,000 remaining in funding assistance.

## **21. MILTON: South System (Small Portion Tributary to the North System)**

Background Information:

- Miles of Sewer: 83
- Sewered Population: 25,113
- Three Year ('10 - '12) Annual Average I/I: 2.02 mgd
- MassDEP Administrative Actions: Amended AO Docket No. 580 (March 1986)

Latest I/I or SSES Report: I/I Rehabilitation – Year 7 Design (May 2012)  
I/I Rehabilitation – Year 7 Construction (June 2013)  
I/I Town-Wide Sewer Evaluation – Year 8 (January 2013)  
I/I Rehabilitation – Year 8 Design (April 2013)  
I/I Rehabilitation – Year 8 Construction (Ongoing)  
I/I Town-Wide Sewer Evaluation – Year 9 (Ongoing)

Private Source Inflow Removal Program: The Town is continuing to pursue the removal of sump pumps and other private inflow sources identified through a previously completed building inspection program. All new connections to the municipal sanitary sewer system will be charged a one-time I/I mitigation fee. Connection applicants must remove four gallons of I/I from the sewer system for each one gallon of new wastewater flow requested in the connection permit. If there are not sources of I/I that, at the discretion of the DPW Director, are appropriate for removal at the time of the permit, a monetary fee may be required (at a cost of \$3.00 per gallon of flow per day to be removed).

I/I Rehabilitation Projects in Design or Construction: Year 7 I/I Rehabilitation Construction completed May 2012. TV inspection of 37,600 LF of sewer in subareas DI-01 / G-02 / G-11B / G-22 revealed an estimated 43,632 gpd of peak infiltration. Topside manhole inspection of 271 manholes in subareas DI-01 / G-02 / G-10A / G-11B / G-22 revealed an estimated 22,896 gpd of peak infiltration. Year 7 I/I Rehabilitation Construction retesting was completed June 2013.

Year 6 I/I Rehabilitation Construction completed July 2012 (Milton Contract No. S11-1 / MWRA Project No. WRA-P7-21-3-733). Year 6 I/I Rehabilitation Design was completed April 2011. A Re-Prioritization Evaluation Report was completed March 2009. This report updated the Town-Wide Sewer Evaluation schedule for the next twelve years.

Reporting Period Activity: Year 8 I/I Rehabilitation Investigation completed January 2013. Year 8 I/I Rehabilitation Design was completed April 2013. Television inspection of 39,225 LF of sewer in Subareas G-09A / G-12A / G-12D / G-13A / G-15 / PS-01 / S-17 revealed an estimated 62,496 gpd of peak infiltration. Topside manhole inspection of 215 manholes in Subareas G-09A / G-12A / G-12D / G-13A / G-15 / PS-01 / S-17 revealed an estimated 19,296 gpd of peak infiltration. Year 8 Construction has been awarded and is set to begin Summer 2013. Year 9 Investigation was completed Spring 2013.

MWRA I/I Local Financial Assistance Program: The community has financed seventeen (17) I/I reduction projects through the Authority's funding assistance program. Of the \$3,736,500 allotted through the Program's Phases 1-8, the community has \$485,000 remaining in funding assistance.

## **22. NATICK: South System**

### Background Information:

- Miles of Sewer: 135
- Sewered Population: 27,767
- Three Year ('10 - '12) Annual Average I/I: 1.16 mgd
- MassDEP Administrative Actions: AO Docket No. 593 (November 1985)

Latest I/I or SSES Report: Town-Wide SSES (Ongoing)

Private Source Inflow Removal Program: The SSES (MWRA Project No. WRA-P5-22-1-523) includes a house-to-house inspection component. Home inspections also have been conducted in conjunction with a water meter replacement program. The Town prepared an informational handout on eliminating sump pump connections to the wastewater system, which was distributed to targeted/suspect areas of the community.

I/I Rehabilitation Projects in Design or Construction: CIPP lining design of 15,300 LF of 8 to 16-inch sewer main in Subsystems 10 / 12 / 15 / 19 / 20 is complete. The Three Year Sewer Rehabilitation Project (Contract No. S-127 / MWRA Project No. WRA-P7-22-3-761) was bid June 2013. Construction scheduled to begin September 2013 with completion anticipated to take one year. The peak infiltration estimated to be removed is 0.24 MGD.

Reporting Period Activity: Walnut Hill Drive (5 homes) – The three remaining homes are now occupied; Heavey Estates (4 homes) - No homes have tied in yet; South Natick Hills (268 unit condo development; privately-owned sewers) – Currently 232 units have tied in. No. 186-202 East Central St. [5 duplexes (10 units)] – The remaining four units have tied into the sewer and all units are now occupied; Hunters Hill Subdivision (11 homes) – Seven of the eleven homes in this phase have tied in; Hunters Hill Subdivision (Phase II) – This is a new second phase connected to the previously submitted Hunters Hill Subdivision. It was recently approved but no construction has begun. There will be 12 sewer services located on 1031 LF of 8-inch PVC gravity sewer; Cider Mill Estates – A sewer extension of 1462 LF of 8-inch PVC gravity sewer is currently being constructed. There will be 11 services off of this extension.

MWRA I/I Local Financial Assistance Program: The community has financed six (6) I/I reduction projects through the Authority's funding assistance program. Of the \$3,644,600 allotted through the Program's Phases 1-8, the community has \$1,374,000 remaining in funding assistance.

## **23. NEEDHAM: South System**

### Background Information:

- Miles of Sewer: 132
- Sewered Population: 27,786
- Three Year ('10 - '12) Annual Average I/I: 1.84 mgd
- MassDEP Administrative Actions: AO Docket No. 549 (November 1984)

Latest I/I or SSES Report: Sewer Infiltration Investigation for Subareas 16 and Lower 22 - Phase 2 Report (August 2011)  
I/I Investigation (October 2013)  
Town-wide Infiltration/Inflow Report (October 2013)

Private Source Inflow Removal Program: A private source identification program, using Town-owned CCTV equipment, is ongoing.

I/I Rehabilitation Projects in Design or Construction: The Infiltration Rehabilitation (Subareas 16 / Lower 22 and Others) Project (MWRA Project Nos. WRA-P7-23-3-751 / Needham Contract No. FY 12-14-01) included design and construction of sanitary sewer infiltration reduction measures. Project work is complete. Project work included cleaning and TV inspection of 14,500 LF of sewer main; chemical root treatment of 650 LF of gravity sewer; cleaning, testing and sealing 800 LF of gravity sewer; installing 2200 LF of CIP liner; renewing three sewer service laterals; sealing 35 wyes; point repairs at 20 sections of gravity sewer; removing and replacing seven 20 foot sections of gravity sewer; removing and replacing 14 sewer manholes; and cleaning, sealing and coating the interior of 4 sewer manholes. An estimated 0.04 mgd of peak infiltration was removed from the collection system.

The Infiltration Rehabilitation (Subareas 16 / Lower 22) Project (MWRA Project Nos. WRA-P7-23-3-716/723 / Needham Contract No. FY 11-40-01) included design and construction of sanitary sewer infiltration reduction measures. Project work is complete. Project work included chemical root treatment of 13,300 LF of gravity sewer; cleaning, testing and sealing 14,300 LF of gravity sewer; grouting 17 services at the sewer main; point repairs at 17 sections of gravity sewer; removing and replacing twenty-two 20 foot sections of gravity sewer; removing and replacing one 80 foot section of gravity sewer; and cleaning, sealing and coating the interior of 24 sewer manholes. An estimated 0.14 mgd of peak infiltration was removed from the collection system.

Reporting Period Activity: Town-Wide TV inspection of 14,502 LF of sewer main was completed. Twenty-five (25) temporary flow meters were installed Town-Wide for I/I monitoring. Twelve (12) permanent flow meters are scheduled to be installed for continued I/I monitoring. Two hundred (200) LF of sewer main was replaced on Kendrick Street. The Town relined 208 LF of sewer main on Reservoir Street. Reservoir B Pump Station replacement design complete. Pump station replacement construction scheduled for completion Fall 2013.

Sewer Extensions: 262 LF of sewer pipe on Armen Way installed by private developer; 371 LF of sewer pipe on Putnam Road installed by private developer; 627 LF of sewer pipe on South/Chestnut Street installed by private developer; 209 LF of sewer pipe on Country Way installed by private developer; 145 LF of sewer pipe on High Street installed by private developer; 105 LF of sewer pipe at Greendale installed by private developer; 1514 LF of sewer pipe on Farley Pond Lane installed by private developer; 620 LF of sewer pipe on Second Avenue installed by private developer; 323 LF of sewer pipe on Greendale Avenue installed by private developer.

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority's funding assistance program. Of the \$4,269,600 allotted through the Program's Phases 1-8, the community has \$1,377,450 remaining in funding assistance.

## **24. NEWTON: North and South Systems**

### Background Information:

- Miles of Sewer: 271
- Sewered Population: 80,907
- Three Year ('10 - '12) Annual Average I/I: 9.87 mgd
- MassDEP Administrative Actions: ACO-NE-00-1001  
ACOP-NE-96-1005 (March 1997)

### Latest I/I or SSES Reports:

Commonwealth Ave Sewer/Underdrain Investigation Final Report (May 2011)

Newton Commonwealth Golf Course Sewer & Drain Evaluation Report (November 2012)

CIP – Project 1 Sewer System Evaluation Survey Final Report (November 2012)

CIP – Project 1, 2 & 3 Smoke Testing Final Report (November 2012)

CIP – Project 2 Sewer System Evaluation Survey Report (Spring 2013)

CIP – Project 4, 5, 6 & 7 Smoke Testing Report (Summer 2013)

### Private Source Inflow Removal Program:

Under the Private Inflow Inspection Program, 74 of the positive Inflow sources have been removed during the current reporting period.

The City is currently negotiating with the developer for the Riverside "Mixed-Use Development" for a 8:1 mitigation removal rate of sanitary sewage for the impacted area downstream of the development.

I/I Rehabilitation Projects in Design or Construction:

- The post-rehabilitation flow isolation for the Area B Sanitary Sewer Rehabilitations Project (Invitation for Bid #10-26) was completed in April 2013.
- The design of the recommended sewer rehabilitations for the Phase IA was incorporated into CIP Project 1 Rehabilitations.
- CIP Project 1 Rehabilitations were advertised for public bidding on June 4, 2013. Bids will be opened on July 3, 2013.

Reporting Period Activity:

- See above for description of design and construction work.
- The CIP – Project 1 Sewer System Evaluation Survey Study was completed in November 2012.

MWRA I/I Local Financial Assistance Program: The community has financed twenty-four (24) I/I reduction projects through the Authority's funding assistance program. Of the \$13,861,400 allotted through the Program's Phases 1-8, the community has \$2,296,000 remaining in funding assistance.

## **25. NORWOOD: South System**

Background Information:

- Miles of Sewer: 83
- Sewered Population: 27,675
- Three Year ('10 - '12) Annual Average I/I: 2.40 mgd
- MassDEP Administrative Actions: AO Docket No. 534 (July 1983)

Latest I/I or SSES Report: Hawes Brook Sewer Evaluation (July 2009)  
Washington Street Sewer Evaluation (August 2010)

Private Source Inflow Removal Program: Within the Hawes Brook sewer tributary area, eight property owners have been notified to redirect sump pumps. A Guild Street apartment building roof drain was disconnected from sanitary system. As part of the Meadowbrook Area Sewer Inspection, ten buildings were inspected for illicit connections. Eleven illegal connections removed to date.

I/I Rehabilitation Projects in Design or Construction: Hoyle Street Area (Hospital Area @ Meadowbrook) Sewer System Rehabilitation Project (MWRA Project No. WRA-P8-25-3-814) design is complete. Project is in bidding phase. Hawes Brook - Westover Parkway Area Sewer Rehabilitation Design (Contract No. NPW-12-03) completed December 2011 (construction funded by SRF). Work includes lining 16,680 LF of 8 through 15-inch sewers, manhole rehabilitation and CIP lining of 174 sewer service connections. Hawes Brook - Westover Parkway Area Sewer Rehabilitation Construction substantially complete. Hospital and Florence Avenue Areas Sewer Rehabilitation (SRF Project) is complete. Work included lining 7500 LF of 6 through 12-inch sewers, manhole rehabilitation and CIP lining of 100 sewer service connections.

Reporting Period Activity: Vanderbilt Avenue Pumping Station rehabilitation complete.

MWRA I/I Local Financial Assistance Program: The community has financed seventeen (17) I/I reduction projects through the Authority's funding assistance program. Of the \$4,519,400 allotted through the Program's Phases 1-8, the community has \$564,001 remaining in funding assistance.

## 26. QUINCY: South System

### Background Information:

- Miles of Sewer: 202
- Sewered Population: 92,330
- Three Year ('10 - '12) Annual Average I/I: 5.73 mgd
- MassDEP Administrative Actions: AO Docket No. 644 (October 1986)

Latest I/I or SSES Report: Squantum Area Flow Monitoring Evaluation Study (May 2008)  
Tidal I/I Source Identification Study (July 2009)  
Coastal Pipeline Inflow Investigation Study (January 2010)  
Quincy SSES (May 2011)  
Additional Coastal CCTV Investigations (July 2011)  
Downtown I/I Mitigation - New Quincy Center FEIR (November 2012)

Private Source Inflow Removal Program: Storm Water Discharge Ordinance has been approved. The ordinance forbids non-sanitary connections. A new fee structure was recently made effective (as of July 1, 2013) and outlines penalties for illegal connections/discharges to the sanitary sewer system. Developers contribute one percent of total project value to Sewer Rehabilitation Fund. The City has purchased a TV sewer inspection vehicle. The vehicle provided significant input towards the development of the Tidal I/I Source Identification Study.

I/I Rehabilitation Projects in Design or Construction: It is anticipated that the City will be completing a significant amount of I/I reduction work over the coming years based upon the results of the July 2009 Tidal I/I Source Identification work.

Coastal manhole inspections were completed Summer 2009 with rehabilitation design completed Winter 2010. In March 2010, the City awarded a construction contract to Aqualine Industries to conduct sewer manhole rehabilitation in coastal areas. The Coastal Manhole Rehabilitation Construction Contract I was completed during Summer 2011. Work included the rehabilitation of 139 manholes and is estimated to have removed approximately 0.50 MGD of I/I. This work was partially funded through the MWRA I/I Local Financial Assistance Program.

Additional manhole inspections and sewer CCTV inspections were conducted during 2010/2011. Recommendations from this work resulted in the Coastal Structures I/I Reduction Project Phase IIA (MWRA Project No. WRA-P7-26-3-737). This project was bid in August 2011. Rehabilitation construction is now complete. Warranty retesting work was performed in Spring/Summer 2013. Phase IIA work is estimated to have removed 0.85 MGD of peak I/I.

Coastal Structures I/I Reduction Project Phase IIB (MWRA Project No. WRA-P7-26-3-737) will be designed and bid Fall/Winter 2013-14 with an expected construction start in Spring 2014. The work currently proposed under this phase includes approximately 2200 LF of CIPP lining in the salt marsh along East Squantum Street and open cut repairs through the Houghs Neck area. Estimated project cost is \$900,000. Phase IIB work is estimated to remove 0.52 MGD of peak I/I.

Reporting Period Activity: Flow metering and CCTV investigations relating to the downtown redevelopment have been conducted in the Chestnut Street/Hancock Street/Cottage Avenue triangle area and also in the Hospital Hill area (Quincy Medical Center). Sewer replacement in the downtown area will be conducted as part of the redevelopment. I/I rehabilitation work will be performed in the Hospital Hill area as well. Approximately 170,000 gpd of I/I must be removed prior to the planned occupancy of the Block 4 (Merchants Row) phase of the downtown redevelopment. This work is expected to be completed over the next two years. Fort Square Pump Station Upgrade Design is scheduled to begin Fall 2013.

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority's funding assistance program. Of the \$12,882,000 allotted through the Program's Phases 1-8, the community has \$1,757,000 remaining in funding assistance.

## **27. RANDOLPH: South System**

### Background Information:

- Miles of Sewer: 101
- Sewered Population: 30,032
- Three Year ('10 - '12) Annual Average I/I: 1.58 mgd
- MassDEP Administrative Actions: AO Docket No. 548 (July 1985)

Latest I/I or SSES Report: Amelian Road SSES (January 2003)  
Internal TV Inspection Report (August 2010)  
I/I Investigation – March 2010 Storm Events (July 2013)

Private Source Inflow Removal Program: The Town developed a sump pump inspection and amnesty program. As a result of the program, the Town was contacted by two hundred and two (202) homeowners having sump pumps. Internal inspections were completed to determine sump pump locations. One hundred twenty-one homes (121) were determined to have sump pumps connected to the sewer system. Ninety-four (94) of these homes have drainage directly adjacent to the homes. Each of the 94 homes was inspected. Design was completed to redirect these sump pumps to the drainage system. Sump pump redirection construction was in 2011 (Randolph Contract Nos. 08-SP1/2/3 / MWRA Project No. WRA-P6-27-3-655). Total peak flow inflow removed is estimated to be 0.61 mgd.

I/I Rehabilitation Projects in Design or Construction: An I/I Investigation Report (July 2013) was drafted for the community areas affected by the March 2010 storm events. As a result of that report a rehabilitation contract (MWRA Project No. WRA-P8-27-3-820) is currently being designed. Design is scheduled to be completed October 2013 with a contract award anticipated for Spring 2014.

Reporting Period Activity: Replacement of Vine Street Pump Station scheduled to begin Spring 2013.

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority's funding assistance program. Of the \$3,894,800 allotted through the Program's Phases 1-8, the community has \$1,083,900 remaining in funding assistance.

## **28. READING: North System**

### Background Information:

- Miles of Sewer: 96
- Sewered Population: 22,038
- Three Year ('10 - '12) Annual Average I/I: 1.55 mgd
- MassDEP Administrative Actions: None

### Latest I/I or SSES Report:

“Infiltration/Inflow Investigations – Spot Gauging & Flow Isolation” Final Report (August 2010)

“Infiltration and Inflow (I/I) Investigations” Final Report (November 2012)

Private Source Inflow Removal Program: The Town is continuing to work with property owners where illicit connections that were found during the Building Inspection Program. The Town received I/I funds totaling \$255,906.57

### I/I Rehabilitation Projects in Design or Construction:

- Contract Documents were prepared for the “Tennyson Road, Whittier Road & Browning Terrace Sewer Main Rehabilitation and Replacement Project” (Contract #13-05). This project was bid and awarded to Joseph P. Cardillo & Sons. Construction is ongoing. To date, 616 LF of 8” sewer, 6 manholes and 222 LF of 4” sewer laterals have been replaced.
- During the last year, the Town cleaned and TV inspected 26,180 LF of sewer; performed 827 joint tests; sealed 566 joints; and cement-lined 68 VF of manholes.

Reporting Period Activity:

- The Infiltration/Inflow Investigations Final Report, which included responses to MWRA staff comments, was approved by MWRA in December 2012.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$2,941,100 allotted through the Program's Phases 1-8, the community has \$421,000 remaining in funding assistance.

## 29. REVERE: North System

Background Information:

- Miles of Sewer: 98
- Sewered Population: 60,155
- Three Year ('10 - '12) Annual Average I/I: 3.75 mgd
- MassDEP Administrative Actions: No. 837 (April 1991)
- EPA Clean Water Act Administrative Order: EPA Docket No. 07-004 (April 2007)  
CD 1:10-cv-11460 (November 16, 2010)

Latest I/I or SSES Reports:

"Sewer System Evaluation Survey (SSES) Phase I Study Areas – CWSRF No. 3233" Final Report (July 31, 2010)

"Internal CCTV Inspection of Revere Trunk Sewer Technical Memorandum" Report (October 2011)

"Sewer System Evaluation Survey (SSES) – Phase II (CWSRF 3411)" Final Report (July 2011)

"Sewer System Evaluation Survey (SSES) – Phase III (CWSRF 3513)" Final Report (July 2012)

"Comprehensive Stormwater and Wastewater Management Plan (CWSRF 3513)" Final Report (expected December 2013)

"Sewer System Evaluation Survey (SSES) – Phase IV (CWSRF 3655)" Final Report (expected December 2013)

Private Source Inflow Removal Program:

- The City recently awarded a contract for the removal of private inflow sources from 42 properties.
- The City has also established a sump pump amnesty program.

I/I Rehabilitation Projects in Design or Construction:

During the last year, the City lined 28,000 LF of 8-inch sewer; 5700 LF of 10-inch sewer; 600 LF of 14-inch sewer; 500 LF of 12-inch sewer; 1500 VF of manholes and 700 lateral services connections.

Reporting Period Activity: See "Latest I/I or SSES Reports" section and "I/I Rehabilitation Projects in Design or Construction" Section.

MWRA I/I Local Financial Assistance Program: The community has financed six (6) I/I reduction projects through the Authority's funding assistance program. Of the \$6,424,900 allotted through the Program's Phases 1-8, the community has \$922,000 remaining in funding assistance.

### **30. SOMERVILLE: North System**

#### Background Information:

- Miles of Sewer: 128
- Sewered Population: 75,662
- Three Year ('10 - '12) Annual Average I/I: 5.568 mgd
- MassDEP Administrative Actions: Unilateral Order (September 2010)  
NON-NE-00-1006 (January 2000)

Somerville is one of MWRA's five combined sewer service communities (Boston North, Brookline, Cambridge, Chelsea, Somerville). Portions of Somerville are impacted by projects under MWRA's CSO Control Plan.

Latest I/I or SSES Report: City-Wide Sewer Assessment Report (February 2007)

#### Private Source Inflow Removal Program:

City continues to enforce a 4 to 1 I/I Reduction policy with potential developers if the proposed project increases sanitary flows by more than 2000 gpd.

All new development or redevelopment projects are required to separate sewer and stormwater flows leaving the project site. If a separate stormwater system is available in the public right-of-way, stormwater systems from those projects are tied directly into that storm water system.

#### I/I Rehabilitation Projects in Design or Construction:

- East Broadway Rehabilitation Project: Project was publically bid by MassDOT and construction is continuing through the Summer/Fall 2013 and is anticipated to be completed by Spring 2014.
- Middlesex Avenue Sewer/Drain Improvements: Project was publically bid by the City and construction has been completed. The project is estimated to remove 0.194 MGD of I/I from the existing system.
- Beacon Street Water & Sewer Improvements Project: Plans and specifications (100% Set) for the project were submitted to MWRA in May 2013 for review/comment. Project is anticipated to be bid 08/13 and construction should be completed prior to the end of 2013.

Reporting Period Activity: See "Latest I/I or SSES Reports" Section and "I/I Rehabilitation Projects in Design or Construction" Section.

MWRA I/I Local Financial Assistance Program: The community has financed eight (8) I/I reduction projects through the Authority's funding assistance program. Of the \$10,117,800 allotted through the Program's Phases 1-8, the community has \$1,455,010 remaining in funding assistance.

### **31. STONEHAM: North System**

#### Background Information:

- Miles of Sewer: 63
- Sewered Population: 21,085
- Three Year ('10 - '12) Annual Average I/I: 1.64 mgd
- MassDEP Administrative Actions: None
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-028 (August 2009)

Latest I/I or SSES Report: Manhole/CCTV Inspection in Marble/Main Streets Area Final Report (September 2007)

#### Private Source Inflow Removal Program:



In conjunction with the Town's stormwater program and contracts, as part of the Illicit Discharge Detection and Elimination Program (IDDE), the Town continues to investigate illicit cross-connections between the sanitary and storm sewer systems. Over the past four years, this work has been successful at identifying and eliminating illicit connections between the systems.

#### I/I Rehabilitation Projects in Design or Construction:

- Phase 3 Sanitary Sewer Rehabilitation was substantially completed in the Summer/Fall 2011. Warranty inspection of rehabilitation work was completed in April 2013.
- The design of the Phase 4 Sanitary Sewer Rehabilitation was completed in September 2012. Bids were accepted on October 31, 2012 and the contract was awarded to New England Pipe Cleaning Company. Construction is substantially complete, with warranty inspection tentatively scheduled for Fall 2014.

The project mainly consists of cured-in-place pipe lining and cured-in-place spot repairs of the sewers in portions of Barbara Road, Campbell Road, Bear Hill Road, Broadway, Converse Street, Fairview Drive, Gerald Road, Hampton Road, Harrison Street, Isabella Street, Jefts Terrace Easement, Kenwood Avenue, Lucy Street, Main Street, Phillips Road, Rita Road, Rustic Road, South Street, Stonewood Avenue, Sunset Road, Tamarock Terrace, Upland Road, Veterans Lane and Wilson Road.

#### Reporting Period Activity:

- In June 2013, the Town issued a contract for Planning and Design of Phase 5 Sanitary Sewer Rehabilitation. Design is scheduled for completion in the Fall 2013.

In November 2012, funds were distributed for the final planning, design and construction of the "Phase 4 Sanitary Sewer System Rehabilitation" Project (dated September 2012). Under the final planning phase, prior studies, reports and inspection data performed throughout the Town's sewer system were reviewed with Town officials and evaluated to determine the sewer rehabilitations to be included under Phase 4. Consequently, the sewer rehabilitation work is located in multiple areas throughout the Town. The estimated infiltration removal by this project is 0.061 mgd annually (MWRA Project No. WRA-P8-31-3-807).

MWRA I/I Local Financial Assistance Program: The community has financed eight (8) I/I reduction projects through the Authority's funding assistance program. The Town has utilized all of the \$3,291,900 allotted through the Program's Phases 1-8.

## **32. STOUGHTON: South System**

#### Background Information:

- Miles of Sewer: 85
- Sewered Population: 17,933
- Three Year ('10 - '12) Annual Average I/I: 1.67 mgd
- MassDEP Administrative Actions: AO Docket No. 538 (June 1984)

Latest I/I or SSES Report: Flow Metering Report (June 2009)  
Sewer System Evaluation (September 2009)  
Hydraulic Model Report (December 2009)  
Year 5 Rehabilitation Evaluation (December 2009)  
Year 6 Rehabilitation Evaluation (March 2011)  
Year 7 Rehabilitation Evaluation (December 2011)  
Year 8 Rehabilitation Evaluation (May 2013)  
Years 9/10 Rehabilitation Evaluation (Ongoing)

Private Source Inflow Removal Program: The Town has adopted new sewer use regulations which address private inflow removal. TV inspection of service connections / house-to-house inspections is ongoing.

I/I Rehabilitation Projects in Design or Construction: Year 7 Sewer System Evaluation Report completed December 2011 (MWRA Project No. WRA-P7-32-1-750). Years 6/7 Sewer System Infiltration Rehabilitation Design completed July 2012. Years 6/7 rehabilitation construction completed March 2013 (estimated 0.071 mgd of I/I removed). Year 8 Sewer System Evaluation completed May 2013. Years 9/10 Sewer System Evaluation ongoing.

Reporting Period Activity: Sewer extension of approximately 9000 LF off Daly Drive by private developer is ongoing. Sewer extension of approximately 3000 LF at Forest Green by private developer is ongoing.

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority's funding assistance program. Of the \$3,126,900 allotted through the Program's Phases 1-8, the community has \$430,000 remaining in funding assistance.

### **33. WAKEFIELD: North System**

Background Information:

- Miles of Sewer: 93
- Sewered Population: 23,975
- Three Year ('10 - '12) Annual Average I/I: 2.70 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report:

"Sanitary Sewer Investigation Assistance – Subarea 3 Television Inspection of Sewers and Manhole Investigations in Subarea 3 & Subarea 6 Low-lying Areas" Final Report (April 2012)

"Sanitary Sewer Investigation Assistance – Subarea 3 Smoke Testing, Dye Testing & Dye Flooding Program" Final Report (November 2011)

"Sanitary Sewer Investigation Assistance – Municipal Building Inspections" Final Report (November 2011)

Private Source Inflow Removal Program:

- The town is completing the On-Call Sewer System Repair Program construction documents that will target I/I source removal at known public and private sources. Bidding is tentatively schedule for Fall 2013.
- Town continues to require a 4 to 1 removal of flow from completed subdivisions/developments.
- Two areas of roof drainage and the parking lot drainage at the Sheraton Colonial Hotel property were redirected from the sewer system which eliminated an estimated 375,000 gpd of peak inflow.
- Approximately 12,700 sq ft of roof drainage from the Americal building was redirected from the sewer system which eliminated an estimated 332,500 gpd of inflow.

I/I Rehabilitation Projects in Design or Construction:

The design of the sewer rehabilitations, as recommended by the May 2012 *Subarea 3 Television Inspection of Sewers and Manhole Investigations in Subarea 3 and Subarea 6 Low-lying Areas Report*, was completed in March 2013 and approved by MWRA under the construction contract entitled "Sewer System I/I Rehabilitation – Subareas 3 & 6 (Contract No. 13-S1-1373). Bids were opened on June 13, 2013 and construction began on July 8, 2013. This rehabilitation is expected to remove an estimated 59,000 gpd of infiltration and 12,000 gpd of peak design inflow.

Reporting Period Activity:

- The Town embarked on an investigation of approximately 48,000 lf of sewer in Subarea 6, Gauging Areas 6 & 7 that was identified as having high volumes of I/I. This investigation included television inspection and manhole inspections in 5 mini-systems in the Gauging Areas and was performed in June 2013. Report is being prepared.

- In May 2012, funds were distributed for the following two projects: (1) Sewer Subarea #3 additional cleaning & internal TV inspection of sewers; and (2) Sewer Subarea #3 & 6 Design, Bid & Award and Construction of Recommended Sewer and Manhole Rehabilitations (MWRA Project No. WRA-P7-33-3-755).

MWRA I/I Local Financial Assistance Program: The community has financed nineteen (19) I/I reduction projects through the Authority’s funding assistance program. Of the \$3,932,900 allotted through the Program’s Phases 1-8, the community has \$536,000 remaining in funding assistance.

### **34. WALPOLE: South System**

Background Information:

- Miles of Sewer: 59
- Sewered Population: 17,585
- Three Year (‘10 - ‘12) Annual Average I/I: 0.85 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: I/I Removal Program: Year 3 (February 2009)  
 Flow Metering Report (April 2010)  
 I/I Removal Program: Year 4 (June 2011)  
 I/I Removal Program: Year 5 (November 2011)  
 I/I Removal Program: Year 6 (December 2012)  
 I/I Removal Program: Year 7 (Ongoing)

Private Source Inflow Removal Program: The Town includes house-to-house private inflow inspection program as part of its water meter replacement program.

I/I Rehabilitation Projects in Design or Construction: Year 6 I/I Investigation completed December 2012 (MWRA Project No. WRA-P7-34-1-759). Work was undertaken in Subareas 3/12 and included TV inspection of 61,630 LF of sewer and 295 topside manholes inspections. The work revealed an estimated 42,900 gpd of peak infiltration. Years 4/5/6 rehabilitation design will be undertaken in Winter 2013-14.

Reporting Period Activity: Year 7 I/I Investigation was completed Spring 2013. Data review is ongoing.

MWRA I/I Local Financial Assistance Program: The community has financed six (6) I/I reduction projects through the Authority’s funding assistance program. Of the \$2,404,000 allotted through the Program’s Phases 1-8, the community has \$475,700 remaining in funding assistance.

### **35. WALTHAM: North System**

Background Information:

- Miles of Sewer: 138
- Sewered Population: 60,176
- Three Year (‘10 - ‘12) Annual Average I/I: 3.85 mgd
- MassDEP Administrative Actions: ACOP-NE-10-1N001 (February 2010)  
 ACOP-NE-04-1N004 (January 2005)  
 ACOP-NE-02-1003 (May 2003)  
 NON-NE-01-1066 (April 2001)

Latest I/I or SSES Report:

Updated Wastewater Facilities Plan (including Operations and Maintenance Plan) (April 2011)

“Rangley Acres – I/I Removal Project” Report (Spring 2012)

“Polaroid Redevelopment Project” Report (Summer 2013)

Private Source Inflow Removal Program:

- A new consultant was hired to design the removal of 59 illegal sump pumps which has been completed. Project is out to bid. Bids were opened 07/31/13. Construction expected to start October 2013.

I/I Rehabilitation Projects in Design or Construction:

- Construction contract for sewer rehabilitations in Area 12A – 100% complete with final paving in August 2013.
- Construction contract for I/I Rehabilitations in Area 15 – 100% complete.
- Watch Factory I/I Mitigation Phase 3 ongoing during Summer/Fall 2013. Estimated I/I removal is 43,000 gpd.
- The City re-laid six sewer services in reporting period
- Ongoing I/I projects: Trapelo Road at Lexington Street; pipe/manhole replacement; approximate I/I removal estimate is 100,000 GPD; completion in the Fall 2013

Reporting Period Activity:

The following sewer rehabilitations were performed under the Illicit Discharge Detection and Elimination (IDDE) Project for the period July 2012 to June 2013:

- Phase 2:
  1. Performed additional area investigations to isolate pending sources of illicit flow.
  2. Dye-tested several suspicious buildings in Fuller Street, Upton Road, Manning Street, Woerd Ave, River Street, and Canterbury Road.
  3. Third work package for Phases 1 and 2 areas was submitted to the Engineering Department for review.
  4. Construction work is expected to start in Fall 2013.
- Phase 3:
  1. Wet weather outfall sampling has been fully executed in the Clematis Brook watershed. (Masters Brook and Sibley Brook watersheds will be sampled in wet weather when weather conditions allow).
  2. First round of CCTV and junction manhole investigations have been completed.
  3. Building inspections have been performed at multiple locations in Weston St and Wellington Ave.
  4. First round of junction manhole sampling in the newly selected areas has been performed.
  5. The first work package for phase 3 areas has been created and the City of Waltham is reviewing it prior to bidding.
  6. Construction work is expected to start in Fall 2013.

MWRA I/I Local Financial Assistance Program: The community has financed seven (7) I/I investigation projects through the Authority's funding assistance program. Of the \$9,022,400 allotted through the Program's Phases 1-8, the community has \$1,214,000 remaining in funding assistance.

## **36. WATERTOWN: North System**

Background Information:

- Miles of Sewer: 75
- Sewered Population: 32,365
- Three Year ('10 - '12) Annual Average I/I: 1.49 mgd
- MassDEP Administrative Actions: ACOP-NE-97-5004

Latest I/I or SSES Report:

TV Inspection Report - Nichols Avenue & Boylston Street Sewers (June 2009)  
TV Inspection – Lexington Street Sewer (December 2011)

Private Source Inflow Removal Program:

- The Town passed a new ordinance pursuant to the Phase II NSPS Program for Prohibition of Illicit Discharges to the Storm Drain System.

I/I Rehabilitation Projects in Design or Construction:

- The design of Contract No. 12-01S “Construction of Sewer and Drain Replacement in Hovey Street” was completed in July 2012. This contract was bid in September 2012 and awarded to Aqualine Utility, Inc. Construction has begun. Estimated average infiltration removal for this project is 0.078 MGD.
- Contract No. 10-02S (CIPP Lining): Low bidder on spot repairs did not honor their contract and contract time period expired. This work will be placed back out to bid.
- Nine (9) house sewer service laterals were repaired; 204 LF of 10-inch sewer pipe was replaced on Carroll Street prior to CIPP Lining.
- 370 LF of 24-inch VC sewer pipe was replaced with 24-inch PVC pipe off Greenough Boulevard and two (2) new sewer manholes were installed.
- 1400 LF of 8-inch sewer was lined on Carroll Street.
- Replacement of Hovey Street Sewer to begin on 8/13/13.

Reporting Period Activity:

- See “I/I Rehabilitation Projects in Design or Construction” section.
- A consultant for a private developer performed 7000 LF of smoke testing to meet the Town’s I/I Removal Requirements. Three (3) catch basins on Green River Way were found to be connected to the sanitary sewer. Plans for a solution to install a new storm drain line have been submitted and approved by the DPW.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I investigation projects through the Authority’s funding assistance program. Of the \$4,185,800 allotted through the Program’s Phases 1-8, the community has \$1,604,000 remaining in funding assistance.

### **37. WELLESLEY: South System**

Background Information:

- Miles of Sewer: 130
- Sewered Population: 26,645
- Three Year (‘10 - ‘12) Annual Average I/I: 1.93 mgd
- MassDEP Administrative Actions: AO Docket No. 579 (May 1985)

Latest I/I or SSES Report: Phase 2 SSES (November 1994)

Private Source Inflow Removal Program: DPW is contacting the owners of illegal sump pumps, based on previous private source inflow studies. To date, 18 sump pumps have been removed from the sanitary system. Also, the Town continues to pursue illegal sump pump connections identified through the water meter ERT Battery Changeout Transaction Program.

I/I Rehabilitation Projects in Design or Construction: The third year of Contract No. 09C-460-1366 Fuller Brook Area Sewer Inspection and Rehabilitation was completed Fall 2012 (MWRA Project No. WRA-P7-37-3-758). Approximately 53,948 LF of sanitary sewer mains were cleaned and CCTV inspected. Approximately 1711 joints of VC sewer pipe were tested and, of that, 538 joints needed to be sealed and retested. This results in a failure rate of 31%. The estimated annual I/I reduction is approximately 2725 gpd with an estimated 9% reduction of storm-related I/I, based on previous studies (ADS Environmental Services, Inc. Final Report on the comprehensive flow monitoring and evaluation).

The first year of Contract No. 13C-460-1482 (Sewer Inspection and Rehabilitation) began in December 2012. To date, eight (8) cured-in-place short liners have been installed. Approximately 40 LF of VC sewer pipe has been repaired. There have been fifty-three (53) sewer manholes sealed (totaling 405 VF). In addition, 11,937 LF of VC sewer pipe has been treated with herbicidal chemicals to kill and destroy roots. Estimated peak monthly removal is 1281 gpd.

Reporting Period Activity: See above work description.

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I reduction projects through the Authority's funding assistance program. Of the \$3,769,700 allotted through the Program's Phases 1-8, the community has \$1,020,892 remaining in funding assistance.

### **38. WESTWOOD: South System**

Background Information:

- Miles of Sewer: 77
- Sewered Population: 13,480
- Three Year ('10 - '12) Annual Average I/I: 0.63 mgd
- MassDEP Administrative Actions: AO Docket No. 578 (May 1985)

Latest I/I or SSES Report: SSES Phases 1 and 2 (January 1991)  
Town-Wide I/I Study (Ongoing)

Private Source Inflow Removal Program: A house-to-house inspection survey has been completed. The survey included inspection of 1880 residences and identified 135 suspect sump pumps. Sump pump removal notification letters forthcoming. Town-Wide I/I Study ongoing.

I/I Rehabilitation Projects in Design or Construction: Sewer System Rehabilitation Project (Westwood Project No. 4808 / MWRA Project No. WRA-P7-38-3-753) is substantially complete. Warranty liner replacement work on Edgewater Street recently completed. Project work included CIP lining of 17,700 LF of 8 and 12-inch sewers, 420 VF of cementitious interior manhole lining and grouting 247 service laterals/ mainline connections. Extended warranty inspection scheduled for Spring 2014.

Reporting Period Activity: Manhole rehabilitation/replacement work ongoing (Westwood Project No.13-004).

MWRA I/I Local Financial Assistance Program: The community has financed six (6) I/I reduction projects through the Authority's funding assistance program. Of the \$1,650,300 allotted through the Program's Phases 1-8, the community has \$225,000 remaining in funding assistance.

### **39. WEYMOUTH: South System**

Background Information:

- Miles of Sewer: 238
- Sewered Population: 51,131
- Three Year ('10 - '12) Annual Average I/I: 4.05 mgd
- MassDEP Administrative Actions: ACO-NE-04-1N002 (September 2004)  
NON-NE-00-1025 (August 2000)  
AO Docket No. 543 (November 1984)

Latest I/I or SSES Report: Sewer System Hydraulic Model / Evaluation (November 2009)  
Town-Wide Sewer Investigation – Year 2 (October 2010)  
Union Street Area Sewer Investigation (October 2010)  
Hinston Road Sewer Evaluation / Design (June 2011)

Private Source Inflow Removal Program: The Town has completed the redirection of 330 sump pumps (for an estimated 165,000 gpd of inflow removal). Six (6) sump pumps were redirected during FY13.

I/I Rehabilitation Projects in Design or Construction: Hinston Road/Neck Street Area Sewer Rehabilitation Project (Contract PW-12-006-S / MWRA Project No. WRA-P7-39-3-749) was completed September 2012. Work included CIP lining of 3587 LF of 15, 18 and 24-inch sewers and 105 VF of cementitious interior manhole lining. The Hinston Road/Neck Street Area Sewer Rehabilitation Project – Phase II Design was completed January 2013. Construction was completed July 2013 and an estimated 0.03 MGD of peak infiltration was removed through the project. The Town is currently designing the replacement of 2040 LF of 30-inch RC sewer associated with the Lower Central Interceptor [just upstream of the MWRA Headhouse at Newell Park (Idlewell Boulevard)].

Reporting Period Activity: Years 1 & 2 Sewer Rehabilitation Construction is ongoing. An estimated 0.44 MGD of peak infiltration will be removed through the project.

MWRA I/I Local Financial Assistance Program: The community has financed twelve (12) I/I reduction projects through the Authority's funding assistance program. Of the \$7,490,900 allotted through the Program's Phases 1-8, the community has \$2,141,600 remaining in funding assistance.

#### **40. WILMINGTON: North System**

Background Information:

- Miles of Sewer: 20
- Sewered Population: 3,962
- Three Year ('10 - '12) Annual Average I/I: 0.56 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report:

Draft Infrastructure Maintenance & Management Program (IMMP) Phase 2 Report (March 2005)

Private Source Inflow Removal Program: Town continuing inspections on an as needed basis.

I/I Rehabilitation Projects in Design or Construction:

- The warranty inspection, retesting and required repairs for the Main Street Interceptor Sewer Rehabilitation Project was completed in October 2012.

Reporting Period Activity: See above work description.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$1,606,000 allotted through the Program's Phases 1-8, the community has \$218,000 remaining in funding assistance.

#### **41. WINCHESTER: North System**

Background Information:

- Miles of Sewer: 83
- Sewered Population: 21,069
- Three Year ('10 - '12) Annual Average I/I: 1.28 mgd
- MassDEP Administrative Actions: None (Draft ACO in 2001 was not finalized).

Latest I/I or SSES Report:

West Side Building Inspection Report (May 2009)

Squire Road & Meter #4 Area Sewer System Evaluation Survey Final Report (June 2013)

Stowell & Marshall Road Sewer System Evaluation (June 2013)

Private Source Inflow Removal Program:

- The Town's Private Inflow Source Removal Program is ongoing. The Town removed four (4) sump pumps from the sewer system during this period.

I/I Rehabilitation Projects in Design or Construction: No ongoing design or construction projects were noted during this period.

Reporting Period Activity:

- Squire Road & Meter #4 Area SSES Report completed in June 2013 and submitted to MWRA.
- Stowell and Marshall Road area sewers were cleaned and televised in November 2012.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$2,777,000 allotted through the Program's Phases 1-8, the community has \$928,700 remaining in funding assistance.

## **42. WINTHROP: North System**

Background Information:

- Miles of Sewer: 36
- Sewered Population: 17,497
- Three Year ('10 - '12) Annual Average I/I: 1.21 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Sanitary Sewer Evaluation Report (April 2007)

Private Source Inflow Removal Program:

- The DPW, in partnership with the Building & Plumbing Inspectors, continues to actively seek out illegal sump pump connections to the Town's sewer system.

I/I Rehabilitation Projects in Design or Construction:

- Bids for Contract 3 – Sewer, Water and Drain Improvements Phase were accepted on June 20, 2012. The contract was awarded to Joseph P. Cardillo & Sons. Construction has commenced with all sewer work being completed. Work included replacing 940 LF of 8-inch sewer on Walden Street; replacing 180 LF of 12-inch sewer on Lincoln Street and 880 LF feet of 12-inch sewer on Read Street. Water pipe rehabilitation/replacement is expected to be completed by the Fall 2013.

Reporting Period Activity: See "I/I Rehabilitation Projects in Design or Construction" section above.

MWRA I/I Local Financial Assistance Program: The community has financed eight (8) I/I reduction projects through the Authority's funding assistance program. Of the \$2,221,400 allotted through the Program's Phases 1-8, the community has \$295,000 remaining in funding assistance.

## **43. WOBURN: North System**

Background Information:

- Miles of Sewer: 141
- Sewered Population: 36,871
- Three Year ('10 - '12) Annual Average I/I: 3.11 mgd
- MassDEP Administrative Actions: ACO 2005 (September 2005)  
ACO-NE-01-1005 (August 2001)  
Revised AO Docket No. 619 (November 1984)

Latest I/I or SSES Report:

- East Woburn Sewer Collection System Capital Improvement Plan (October 2011)
- Area #3 Sanitary Sewer Rehabilitation – Post Rehabilitation Flow Evaluation Report (May 2011)
- Arlington Road Area Sanitary Sewer Rehabilitation – Post Rehabilitation Flow Evaluation Report (May 2011)



Private Source Inflow Removal Program:

Under the current ACO, a 10:1 flow reduction is required.

No illicit connections were found or removed during this period.

I/I Rehabilitation Projects in Design or Construction:

- The design of the “Main Street Sanitary Sewer Rehabilitation Project” was completed in May 2013. Bid opening was held on June 5, 2013.

Reporting Period Activity:

- Sewer blockages were repaired at 23 separate locations.
- Heavy cleaning of 1006 LF of sewer is estimated to be completed in Summer 2013 as part of the CIP Project 1 Sewer investigation and Evaluation Project.
- The CIP Project 1 Smoke Testing Program has commenced.

In June 2013, funds were distributed for the following three (3) projects: (1) Main Street Sanitary Sewer Rehabilitation Project - This sanitary sewer rehabilitation project is to be performed in the following areas: Alfred Street, Border Street, Bradford Road, Bryant Street, Campbell Street, Commerce Way, Conn Street, Cross Street, Eaton Avenue, Fletcher Road, Green Street, Harold Avenue, Main Street, Pickering Street, Van Norden Road, and Wade Avenue; (2) Investigation of Sewers for Infiltration - This infiltration investigation project will be completed in the Cross Street & Garfield Avenue subareas. This sewer investigation will include: topside inspection of approximately 378 manholes; flow isolation of approximately 99,218 LF of sewer; light cleaning & TV inspection of approximately 67,987 LF of sewer; heavy cleaning & TV inspection of approximately 7,554 LF of sewer; and (3) Inflow Investigation in CIP Project Area 1 - This inflow investigation project will be completed in the following subareas: Bradford Road, Cross Street, Draper Street & Garfield Avenue. This sewer investigation will include smoke testing of approximately 131,000 LF feet of sewer and dye water testing of up to 68 sites and dye water flooding of up to 10 sites to confirm potential sources of inflow identified during the smoke testing. The estimated I/I removal for the Main Street Sewer Rehabilitation Project is 0.02 mgd annually (MWRA Project No. WRA-P8-43-3-813).

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority’s funding assistance program. The City has utilized all of the \$7,229,500 allotted through the Program’s Phases 1-8.

ATTACHMENT 6  
TO  
MWRA ANNUAL I/I REDUCTION REPORT FOR FY13  
Reporting Period – July 2012 Through June 2013

**CY12 COMMUNITY WASTEWATER FLOW DATA**

This attachment contains calendar year 2012 wastewater flow data for the 43 MWRA member sewer communities. There are four separate data tables as detailed below.

TABLE 1 (one page - page number 2) presents the CY12 MWRA Wastewater Metering System Community Flow Estimates. This data is monthly total wastewater flow estimates for each of the 43 member sewer communities derived from MWRA's wastewater metering system. Each community's percent share average daily flow and percent share maximum month flow are used as components of MWRA's annual wholesale sewer charge.

TABLE 2 (one page - page number 3) presents the CY12 MWRA Community Wastewater Flow Component Estimates. This data is developed through an engineering analysis by MWRA staff of each community's total wastewater flow to estimate flow components, including: dry day average daily flow, average daily infiltration, average sanitary flow, and average daily inflow. The data in TABLE 2 is annual data. The percent share for each estimated flow component is also presented. The data presented in TABLE 2 is a summary of the more detailed monthly flow component analysis presented in TABLE 4.

TABLE 3 (three pages - page numbers 4 through 6) presents the CY12 Community Wastewater Flow Component Estimates in two formats: Alphabetical Detail is presented on page 1 of 3; Ranked Detail is presented on pages 2 of 3 and 3 of 3. Ranked data tables are presented to allow for community comparison.

TABLE 4 (13 pages - page numbers 7 through 19) presents the Estimated Community Wastewater Flow Components for CY12. This data is developed through an engineering analysis by MWRA staff of each community's monthly wastewater flow (derived from MWRA's wastewater metering system) to estimate flow components, including: dry day average daily flow, average daily infiltration, average sanitary flow, and average daily inflow. The data listed as MWRA Estimated Infiltration is a calculated estimate of the infiltration entering MWRA-owned sewers that are upstream of wastewater flow meters. The calculation is a weighted allocation of the Raw Estimated Infiltration to the portion of the sewer system that is MWRA-owned versus community-owned. The weighted allocation is based on inch-diameter miles of MWRA-owned and community-owned sewer. The data presented in TABLE 4 is also presented in TABLE 2 as an annual summary.

**TABLE 1 - CY12 MWRA WASTEWATER METERING SYSTEM COMMUNITY FLOW ESTIMATES**

Community	Total Population	Sewered Population	CY12 Average Daily Flow (ADF) By Calendar Month (MGD)												12 Month Average Daily Flow (MGD)	Percent Average Daily Flow	Max. Month ADF (MGD)	Percent Max. Month ADF
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
Arlington	43,290	42,857	5.24	4.73	4.69	3.94	4.55	4.25	3.09	3.28	3.11	3.47	3.90	4.92	4.10	1.5%	5.24	1.5%
Ashland	16,767	12,743	1.32	1.23	1.17	1.04	1.10	1.01	0.86	0.89	0.99	1.14	1.21	1.25	1.10	0.4%	1.32	0.4%
Bedford	13,455	12,379	2.79	2.67	2.64	2.34	2.50	2.21	1.90	1.87	1.76	1.97	2.17	2.31	2.26	0.8%	2.79	0.8%
Belmont	24,987	24,537	3.35	2.77	2.50	2.30	2.82	2.68	2.06	2.17	1.96	2.20	2.48	3.21	2.54	0.9%	3.35	1.0%
BWSC	625,087	624,462	92.15	80.55	80.27	85.02	89.34	91.72	85.53	85.70	91.53	85.65	78.77	101.45	87.35	31.4%	101.45	29.8%
Braintree	35,990	34,910	6.94	6.16	6.22	5.47	6.14	5.73	4.48	4.88	4.41	4.72	5.47	6.37	5.58	2.0%	6.94	2.0%
Brookline	59,132	59,073	9.94	8.97	9.26	8.34	9.52	8.92	7.70	7.34	7.21	7.22	7.32	9.62	8.45	3.0%	9.94	2.9%
Burlington	24,755	24,507	3.70	3.41	3.37	2.98	3.34	3.03	2.39	2.43	2.30	2.45	2.74	3.12	2.94	1.1%	3.70	1.1%
Cambridge	106,038	105,932	15.73	13.88	14.30	15.03	16.34	17.02	14.97	14.61	16.05	16.67	13.99	19.68	15.70	5.6%	19.68	5.8%
Canton	21,710	14,459	2.86	2.55	2.40	2.38	2.57	2.30	1.99	2.08	2.17	2.32	2.60	2.92	2.43	0.9%	2.92	0.9%
Chelsea	35,649	35,649	4.78	3.90	4.11	4.29	4.54	4.79	3.92	3.93	4.26	4.13	3.82	5.90	4.37	1.6%	5.90	1.7%
Dedham	24,895	23,650	3.44	3.24	3.20	2.79	3.23	2.79	2.34	2.39	2.16	2.29	2.93	3.63	2.87	1.0%	3.63	1.1%
Everett	42,101	42,101	5.66	5.14	5.37	5.27	5.65	5.47	4.46	4.37	4.55	4.49	4.49	6.24	5.10	1.8%	6.24	1.8%
Frammingham	68,991	62,092	6.54	5.84	5.88	5.43	5.86	5.16	4.56	4.67	4.70	5.88	6.58	6.75	5.66	2.0%	6.75	2.0%
Hingham	7,201	6,652	1.33	1.13	1.17	1.07	1.16	1.08	0.84	0.82	0.77	0.84	1.02	1.38	1.04	0.4%	1.38	0.4%
Holbrook	10,866	9,557	0.76	0.69	0.71	0.68	0.75	0.71	0.59	0.57	0.64	0.69	0.89	1.04	0.73	0.3%	1.04	0.3%
Lexington	31,718	30,557	5.61	5.16	5.01	4.35	5.07	4.63	3.27	3.12	3.06	3.35	4.23	4.83	4.31	1.6%	5.61	1.6%
Malden	60,071	60,011	9.17	8.30	8.34	7.90	8.59	8.64	7.50	7.55	7.07	7.21	7.84	9.93	8.17	2.9%	9.93	2.9%
Medford	56,738	56,681	7.64	6.62	6.92	6.68	7.57	7.49	6.00	5.89	5.73	6.36	6.92	9.50	6.95	2.5%	9.50	2.8%
Melrose	27,263	27,236	4.68	3.81	4.08	3.55	4.24	4.19	3.22	3.25	3.10	3.37	3.95	5.19	3.89	1.4%	5.19	1.5%
Milton	27,182	25,279	3.30	2.65	2.71	2.36	2.74	2.29	1.76	1.79	1.68	1.81	2.19	3.07	2.36	0.8%	3.30	1.0%
Natick	33,349	29,481	3.33	2.95	2.93	2.62	2.91	2.63	2.33	2.29	2.18	2.36	2.87	3.06	2.71	1.0%	3.33	1.0%
Needham	29,083	28,152	3.37	3.10	3.00	2.80	3.43	2.98	2.45	2.47	2.41	2.36	3.07	3.38	2.90	1.0%	3.43	1.0%
Newton	85,945	84,914	18.67	15.46	14.91	12.85	14.58	12.78	10.56	11.06	10.14	11.42	13.22	16.56	13.52	4.9%	18.67	5.5%
Norwood	28,801	28,254	5.02	4.51	4.82	3.99	4.66	4.03	3.30	3.39	3.19	3.52	4.51	5.04	4.17	1.5%	5.04	1.5%
Quincy	92,909	92,909	13.58	12.25	12.13	11.93	12.82	12.78	10.98	11.13	10.10	10.30	10.96	12.60	11.80	4.2%	13.58	4.0%
Randolph	32,336	32,304	3.81	3.44	3.44	3.10	3.42	3.18	2.62	2.48	2.33	2.36	2.98	3.47	3.05	1.1%	3.81	1.1%
Reading	25,001	24,751	3.25	2.85	2.95	2.46	2.85	2.60	2.00	1.93	1.84	2.08	2.45	2.98	2.52	0.9%	3.25	1.0%
Revere	52,459	52,407	6.93	5.91	6.26	6.24	6.69	7.09	6.25	6.03	5.85	5.74	5.56	7.97	6.38	2.3%	7.97	2.3%
Somerville	76,519	76,519	10.32	8.23	8.99	9.58	10.61	9.90	7.86	7.96	9.50	9.19	8.12	12.52	9.41	3.4%	12.52	3.7%
Stoneham	21,659	21,269	3.28	3.04	2.93	2.60	3.24	2.87	2.25	2.11	1.97	2.21	2.73	3.56	2.73	1.0%	3.56	1.0%
Stoughton	27,150	18,191	2.73	2.64	2.74	2.31	2.64	2.36	1.94	1.88	1.78	1.79	2.19	2.37	2.28	0.8%	2.74	0.8%
Wakefield	25,191	24,687	4.26	3.83	3.91	3.17	3.87	3.49	2.58	2.53	2.27	2.58	3.19	4.00	3.31	1.2%	4.26	1.3%
Walpole	24,234	17,448	1.99	1.81	1.71	1.64	1.77	1.58	1.33	1.35	1.42	1.54	2.01	2.00	1.68	0.6%	2.01	0.6%
Waltham	61,181	61,120	9.45	8.84	8.70	7.96	8.77	8.07	6.93	7.56	7.16	7.56	8.25	9.37	8.22	3.0%	9.45	2.8%
Watertown	32,248	32,248	3.68	3.39	3.39	2.91	3.21	3.15	2.61	2.78	2.72	2.87	3.06	3.65	3.12	1.1%	3.68	1.1%
Wellesley	28,152	27,420	3.65	3.29	3.20	2.89	3.39	2.76	2.24	2.31	2.34	2.62	3.14	3.49	2.94	1.1%	3.65	1.1%
Westwood	14,721	13,985	1.47	1.31	1.33	1.16	1.32	1.17	1.01	1.00	0.94	1.04	1.30	1.39	1.20	0.4%	1.47	0.4%
Weymouth	54,116	52,276	7.71	6.94	7.26	6.38	7.04	6.81	5.40	5.81	5.50	5.99	7.35	8.41	6.72	2.4%	8.41	2.5%
Wilmington	22,557	4,196	1.28	1.28	1.28	1.13	1.35	1.19	1.03	1.14	1.07	1.15	1.16	1.11	1.18	0.4%	1.35	0.4%
Winchester	21,594	21,572	2.49	2.21	2.15	1.75	2.15	1.93	1.37	1.46	1.38	1.50	1.81	2.43	1.89	0.7%	2.49	0.7%
Winthrop	17,737	17,737	2.09	1.81	1.88	1.93	1.89	2.07	1.71	1.71	1.67	1.66	1.73	2.13	1.86	0.7%	2.13	0.6%
Woburn	38,520	37,364	7.79	7.25	7.91	6.65	6.86	6.53	4.67	5.66	5.24	5.72	6.03	7.69	6.50	2.3%	7.91	2.3%
<b>Total/Average</b>	<b>2,209,348</b>	<b>2,134,527</b>	<b>317.08</b>	<b>279.74</b>	<b>282.14</b>	<b>271.16</b>	<b>297.09</b>	<b>288.06</b>	<b>246.85</b>	<b>249.64</b>	<b>252.21</b>	<b>255.79</b>	<b>263.20</b>	<b>331.49</b>	<b>277.96</b>	<b>100%</b>	<b>340.51</b>	<b>100%</b>

**TABLE 2 - 2012 MWRA COMMUNITY WASTEWATER FLOW COMPONENT ESTIMATES (CY12-12 MONTHS)**

18-Aug-13

COMMUNITY	2012 Averages (1)					Components of Average Daily Flow (Estimated) (2)						Peak Month ADF (MGD)	Percent Peak Month ADF (%)			
	Community Demographics		No. of Connects to MWRA System	Miles of Local Sewers (3)	No. of Meters for Permanent System	Average Daily Flow ADF (MGD)	Percent Average Daily Flow (6)	Selected Dry Day ADF (MGD)	Average Daily Infiltration (MGD)	Infiltration As a % of Average Daily Flow	Average Sanitary Flow (MGD)			Sanitary As a % of Average Daily Flow	Average Daily Inflow (4) (MGD)	Inflow As a % of Average Daily Flow
	Total Population	Sewered Population														
Arlington	43,290	42,857	327	106	7	4.10	1.48%	3.65	1.05	25.6%	2.60	63.4%	0.44	10.7%	5.24	1.54%
Ashland	16,767	12,743	2	66	2	1.10	0.40%	1.05	0.25	22.7%	0.80	72.7%	0.05	4.5%	1.32	0.39%
Bedford	13,455	12,379	1	78	4	2.26	0.81%	2.16	0.86	38.1%	1.30	57.5%	0.10	4.4%	2.79	0.82%
Belmont	24,987	24,537	2	78	2	2.54	0.91%	2.19	0.59	23.2%	1.60	63.0%	0.36	14.2%	3.35	0.98%
BWSC (5)	625,087	624,462	255	858	33	87.35	31.43%	75.42	17.42	19.9%	58.00	66.4%	11.93	13.7%	101.45	29.79%
Braintree	35,990	34,910	21	140	8	5.58	2.01%	5.03	1.83	32.8%	3.20	57.3%	0.55	9.9%	6.94	2.04%
Brookline (5)	59,132	59,073	10	111	13	8.45	3.04%	7.50	3.20	37.9%	4.30	50.9%	0.95	11.2%	9.94	2.92%
Burlington	24,755	24,507	1	115	1	2.94	1.06%	2.78	0.78	26.5%	2.00	68.0%	0.16	5.4%	3.70	1.09%
Cambridge (5)	106,038	105,932	127	148	10	15.70	5.65%	12.83	1.83	11.7%	11.00	70.1%	2.87	18.3%	19.68	5.78%
Canton	21,710	14,459	65	62	6	2.43	0.87%	2.27	0.87	35.8%	1.40	57.6%	0.16	6.6%	2.92	0.86%
Chelsea (5)	35,649	35,649	47	41	8	4.37	1.57%	3.43	0.63	14.4%	2.80	64.1%	0.94	21.5%	5.90	1.73%
Dedham	24,895	23,650	30	95	8	2.87	1.03%	2.60	0.80	27.9%	1.80	62.7%	0.27	9.4%	3.63	1.07%
Everett	42,101	42,101	21	57	7	5.10	1.83%	4.52	1.02	20.0%	3.50	68.6%	0.58	11.4%	6.24	1.83%
Frammingham	68,991	62,092	2	275	4	5.66	2.04%	5.30	1.00	17.7%	4.30	76.0%	0.36	6.4%	6.75	1.98%
Hingham	7,201	6,652	1	33	1	1.04	0.37%	0.94	0.44	42.3%	0.50	48.1%	0.10	9.6%	1.38	0.41%
Holbrook	10,866	9,557	2	31	2	0.73	0.26%	0.68	0.18	24.7%	0.50	68.5%	0.05	6.8%	1.04	0.31%
Lexington	31,718	30,557	17	170	6	4.31	1.55%	3.98	1.58	36.7%	2.40	55.7%	0.33	7.7%	5.61	1.65%
Malden	60,071	60,011	242	100	6	8.17	2.94%	7.43	2.23	27.3%	5.20	63.6%	0.74	9.1%	9.93	2.92%
Medford	56,738	56,681	74	113	6	6.95	2.50%	5.96	1.46	21.0%	4.50	64.7%	0.98	14.1%	9.50	2.79%
Melrose	27,263	27,236	188	74	5	3.89	1.40%	3.37	1.47	37.8%	1.90	48.8%	0.52	13.4%	5.19	1.52%
Milton	27,182	25,279	56	83	13	2.36	0.85%	2.08	0.68	28.8%	1.40	59.3%	0.28	11.9%	3.30	0.97%
Natick	33,349	29,481	30	135	4	2.71	0.97%	2.52	0.72	26.6%	1.80	66.4%	0.18	6.6%	3.33	0.98%
Needham	29,083	28,152	21	132	2	2.90	1.04%	2.70	0.70	24.1%	2.00	69.0%	0.20	6.9%	3.43	1.01%
Newton	85,945	84,914	52	271	7	13.52	4.86%	12.11	5.11	37.8%	7.00	51.8%	1.41	10.4%	18.67	5.48%
Norwood	28,801	28,254	31	83	6	4.17	1.50%	3.74	1.34	32.1%	2.40	57.6%	0.43	10.3%	5.04	1.48%
Quincy	92,909	92,909	56	202	6	11.80	4.25%	10.99	2.49	21.1%	8.50	72.0%	0.81	6.9%	13.58	3.99%
Randolph	32,336	32,304	2	101	2	3.05	1.10%	2.86	0.86	28.2%	2.00	65.6%	0.19	6.2%	3.81	1.12%
Reading	25,001	24,751	2	96	2	2.52	0.91%	2.34	0.94	37.3%	1.40	55.6%	0.18	7.1%	3.25	0.95%
Revere	52,459	52,407	3	98	2	6.38	2.30%	5.46	1.86	29.2%	3.60	56.4%	0.92	14.4%	7.97	2.34%
Somerville (5)	76,519	76,519	43	128	8	9.41	3.39%	6.99	1.69	18.0%	5.30	56.3%	2.42	25.7%	12.52	3.68%
Stoneham	21,659	21,269	27	63	7	2.73	0.98%	2.38	0.78	28.6%	1.60	58.6%	0.35	12.8%	3.56	1.05%
Stoughton	27,150	18,191	1	85	2	2.28	0.82%	2.16	0.66	28.9%	1.50	65.8%	0.12	5.3%	2.74	0.80%
Wakefield	25,191	24,687	11	93	2	3.31	1.19%	2.96	1.26	38.1%	1.70	51.4%	0.34	10.3%	4.26	1.25%
Walpole	24,234	17,448	1	59	2	1.68	0.60%	1.59	0.39	23.2%	1.20	71.4%	0.09	5.4%	2.01	0.59%
Waltham	61,181	61,120	5	138	4	8.22	2.96%	7.55	1.55	18.9%	6.00	73.0%	0.67	8.2%	9.45	2.78%
Watertown	32,248	32,248	14	75	3	3.12	1.12%	2.86	0.56	17.9%	2.30	73.7%	0.26	8.3%	3.68	1.08%
Wellesley	28,152	27,420	2	130	3	2.94	1.06%	2.65	0.95	32.3%	1.70	57.8%	0.29	9.9%	3.65	1.07%
Westwood	14,721	13,985	3	77	3	1.20	0.43%	1.12	0.32	26.7%	0.80	66.7%	0.08	6.7%	1.47	0.43%
Weymouth	54,116	52,276	19	238	4	6.72	2.42%	6.14	2.44	36.3%	3.70	55.1%	0.58	8.6%	8.41	2.47%
Wilmington	22,557	4,196	2	20	1	1.18	0.42%	1.14	0.34	28.8%	0.80	67.8%	0.04	3.4%	1.35	0.40%
Winchester	21,594	21,572	102	83	7	1.89	0.68%	1.69	0.59	31.2%	1.10	58.2%	0.19	10.1%	2.49	0.73%
Winthrop	17,737	17,737	22	36	4	1.86	0.67%	1.72	0.62	33.3%	1.10	59.1%	0.14	7.5%	2.13	0.63%
Woburn	38,520	37,364	18	141	13	6.50	2.34%	6.00	1.57	24.2%	4.43	68.2%	0.50	7.7%	7.91	2.32%
Totals/Averages	2,209,348	2,134,527	1,958	5,318		277.96	100.00%	244.84	67.91	24.4%	176.93	63.7%	33.11	11.9%	340.51	100.00%

**FOOTNOTES:**

- (1) Figures tabulated using data from the MWRA Wastewater Metering System for Calendar Year 2012.
- (2) Wastewater flow components are estimated through engineering analysis by MWRA staff.
- (3) Miles of Local Sewers are from MWRA's regional collection system database or as reported by the Community and do not include service laterals.
- (4) Average Daily Inflow is calculated as a total inflow over the period of January through December 2012 divided by 366 days. Actual inflow during a specific storm event must be calculated separately.
- (5) Community with combined sewers. Inflow figures include combined flow during storm events tributary to MWRA's WWTP.
- (6) Percent average Daily Flow and Percent Peak Month ADF are the two flow-based components of MWRA's Wholesale Sewer Rate Methodology.

Column Summations: Average Daily Flow (ADF) Column F = I+K+M Average Dry Day Flow Column H = I+K

TABLE 3 - 2012 Final Community Wastewater Flow Component Estimates (Alphabetical Detail page 1 of 3)

Community	Sewered Population	Miles of Local Sewers	IDM of Local Sewers	Average Daily Flow ADF (MGD)	Average Annual Infiltration (MGD)	Average Annual Inflow (MGD)	Average Sanitary Flow (MGD)	ADF (GPD Per IDM)	I/I (GPD Per IDM)	Infiltration (GPD Per IDM)	Inflow (GPD Per IDM)	Inflow (GPD Per Sewer Mile)	Average Sanitary (GPD Per Sew. Pop.)
Arlington	42,857	106	954	4.10	1.05	0.44	2.60	4,298	1,562	1,101	461	4,151	61
Ashland	12,743	66	594	1.10	0.25	0.05	0.80	1,852	505	421	84	758	63
Bedford	12,379	78	738	2.26	0.86	0.10	1.30	3,062	1,301	1,165	136	1,282	105
Belmont	24,537	78	708	2.54	0.59	0.36	1.60	3,588	1,342	833	508	4,615	65
BWSC	624,462	858	14,024	87.35	17.42	11.93	58.00	6,229	2,093	1,242	851	13,904	93
Braintree	34,910	140	1,300	5.58	1.83	0.55	3.20	4,292	1,831	1,408	423	3,929	92
Brookline	59,073	111	1,332	8.45	3.20	0.95	4.30	6,344	3,116	2,402	713	8,559	73
Burlington	24,507	115	1,150	2.94	0.78	0.16	2.00	2,557	817	678	139	1,391	82
Cambridge	105,932	148	2,368	15.70	1.83	2.87	11.00	6,630	1,985	773	1,212	19,392	104
Canton	14,459	62	567	2.43	0.87	0.16	1.40	4,286	1,817	1,534	282	2,581	97
Chelsea	35,649	41	618	4.37	0.63	0.94	2.80	7,071	2,540	1,019	1,521	22,927	79
Dedham	23,650	95	832	2.87	0.80	0.27	1.80	3,450	1,286	962	325	2,842	76
Everett	42,101	57	686	5.10	1.02	0.58	3.50	7,434	2,332	1,487	845	10,175	83
Frammingham	62,092	275	2,750	5.66	1.00	0.36	4.30	2,058	495	364	131	1,309	69
Hingham	6,652	33	297	1.04	0.44	0.10	0.50	3,502	1,818	1,481	337	3,030	75
Holbrook	9,557	31	312	0.73	0.18	0.05	0.50	2,340	737	577	160	1,613	52
Lexington	30,557	170	1,763	4.31	1.58	0.33	2.40	2,445	1,083	896	187	1,941	79
Malden	60,011	100	1,000	8.17	2.23	0.74	5.20	8,170	2,970	2,230	740	7,400	87
Medford	56,681	113	1,130	6.95	1.46	0.98	4.50	6,150	2,159	1,292	867	8,673	79
Melrose	27,236	74	641	3.89	1.47	0.52	1.90	6,069	3,105	2,293	811	7,070	70
Milton	25,279	83	747	2.36	0.68	0.28	1.40	3,159	1,285	910	375	3,373	55
Natick	29,481	135	1,180	2.71	0.72	0.18	1.80	2,297	763	610	153	1,333	61
Needham	28,152	132	1,232	2.90	0.70	0.20	2.00	2,354	731	568	162	1,515	71
Newton	84,914	271	2,710	13.52	5.11	1.41	7.00	4,989	2,406	1,886	520	5,203	82
Norwood	28,254	83	763	4.17	1.34	0.43	2.40	5,465	2,320	1,756	564	5,181	85
Quincy	92,909	202	2,020	11.80	2.49	0.81	8.50	5,842	1,634	1,233	401	4,010	91
Randolph	32,304	101	1,138	3.05	0.86	0.19	2.00	2,680	923	756	167	1,881	62
Reading	24,751	96	864	2.52	0.94	0.18	1.40	2,917	1,296	1,088	208	1,875	57
Revere	52,407	98	1,434	6.38	1.86	0.92	3.60	4,449	1,939	1,297	642	9,388	69
Somerville	76,519	128	1,920	9.41	1.69	2.42	5.30	4,901	2,141	880	1,260	18,906	69
Stoneham	21,269	63	567	2.73	0.78	0.35	1.60	4,815	1,993	1,376	617	5,556	75
Stoughton	18,191	85	864	2.28	0.66	0.12	1.50	2,639	903	764	139	1,412	82
Wakefield	24,687	93	888	3.31	1.26	0.34	1.70	3,727	1,802	1,419	383	3,656	69
Walpole	17,448	59	577	1.68	0.39	0.09	1.20	2,912	832	676	156	1,525	69
Waltham	61,120	138	1,380	8.22	1.55	0.67	6.00	5,957	1,609	1,123	486	4,855	98
Watertown	32,248	75	675	3.12	0.56	0.26	2.30	4,622	1,215	830	385	3,467	71
Wellesley	27,420	130	1,300	2.94	0.95	0.29	1.70	2,262	954	731	223	2,231	62
Westwood	13,985	77	693	1.20	0.32	0.08	0.80	1,732	577	462	115	1,039	57
Weymouth	52,276	238	2,380	6.72	2.44	0.58	3.70	2,824	1,269	1,025	244	2,437	71
Wilmington	4,196	20	280	1.18	0.34	0.04	0.80	4,214	1,357	1,214	143	2,000	191
Winchester	21,572	83	747	1.89	0.59	0.19	1.10	2,530	1,044	790	254	2,289	51
Winthrop	17,737	36	324	1.86	0.62	0.14	1.10	5,741	2,346	1,914	432	3,889	62
Woburn	37,364	141	1,410	6.50	1.57	0.50	4.43	4,610	1,468	1,113	355	3,546	119
Total	2,134,528	5,318	59,857	278.0	67.9	33.1	176.9						
Average	49,640	124	1,392	6.5	1.6	0.8	4.1	4,174	1,574	1,130	445	5,072	78

**TABLE 3 - 2012 Final Community Wastewater Flow Component Estimates (Ranked Detail page 2 of 3)**

Community	Sewered Population	Community	Miles of Local Sewers	Community	IDM of Local Sewers	Community	Average Daily Flow ADF (MGD)	Community	Average Annual Infiltration (MGD)	Community	Average Annual Inflow (MGD)	Community	Average Sanitary Flow (MGD)
BWSC	624,462	BWSC	858	BWSC	14,024	BWSC	87.35	BWSC	17.42	BWSC	11.93	BWSC	58.00
Cambridge	105,932	Framingham	275	Framingham	2,750	Cambridge	15.70	Newton	5.11	Cambridge	2.87	Cambridge	11.00
Quincy	92,909	Newton	271	Newton	2,710	Newton	13.52	Brookline	3.20	Brookline	2.42	Quincy	8.50
Newton	84,914	Weymouth	238	Weymouth	2,380	Quincy	11.80	Quincy	2.49	Newton	1.41	Newton	7.00
Somerville	76,519	Quincy	202	Cambridge	2,368	Somerville	9.41	Weymouth	2.44	Medford	0.98	Waltham	6.00
Framingham	62,092	Lexington	170	Quincy	2,020	Brookline	8.45	Malden	2.23	Brookline	0.95	Somerville	5.30
Waltham	61,120	Cambridge	148	Somerville	1,920	Waltham	8.22	Revere	1.86	Chelsea	0.94	Malden	5.20
Malden	60,011	Woburn	141	Lexington	1,763	Malden	8.17	Braintree	1.83	Revere	0.92	Medford	4.50
Brookline	59,073	Braintree	140	Revere	1,434	Medford	6.95	Cambridge	1.83	Quincy	0.81	Woburn	4.43
Medford	56,681	Waltham	138	Woburn	1,410	Weymouth	6.72	Somerville	1.69	Malden	0.74	Brookline	4.30
Revere	52,407	Natick	135	Waltham	1,380	Woburn	6.50	Lexington	1.58	Waltham	0.67	Framingham	4.30
Weymouth	52,276	Needham	132	Brookline	1,332	Revere	6.38	Woburn	1.57	Everett	0.58	Weymouth	3.70
Arlington	42,857	Wellesley	130	Braintree	1,300	Framingham	5.66	Waltham	1.55	Weymouth	0.58	Revere	3.60
Everett	42,101	Somerville	128	Wellesley	1,300	Braintree	5.58	Braintree	1.47	Melrose	0.55	Everett	3.50
Woburn	37,364	Burlington	115	Needham	1,232	Everett	5.10	Medford	1.46	Melrose	0.52	Braintree	3.20
Chelsea	35,649	Medford	113	Natick	1,180	Chelsea	4.37	Norwood	1.34	Woburn	0.50	Chelsea	2.80
Braintree	34,910	Brookline	111	Burlington	1,150	Lexington	4.31	Lexington	1.26	Arlington	0.44	Arlington	2.60
Randolph	32,304	Arlington	106	Randolph	1,138	Norwood	4.17	Norwood	1.05	Norwood	0.43	Lexington	2.40
Watertown	32,248	Randolph	101	Medford	1,130	Arlington	4.10	Everett	1.02	Belmont	0.36	Norwood	2.40
Lexington	30,557	Malden	100	Malden	1,000	Melrose	3.89	Framingham	1.00	Framingham	0.36	Watertown	2.30
Natick	29,481	Revere	98	Revere	954	Wakefield	3.31	Wakefield	0.95	Stoneham	0.35	Burlington	2.00
Norwood	28,254	Reading	96	Wakefield	888	Watertown	3.12	Reading	0.94	Wakefield	0.34	Needham	2.00
Needham	28,152	Dedham	95	Reading	864	Randolph	3.05	Canton	0.87	Lexington	0.33	Randolph	2.00
Wellesley	27,420	Wakefield	93	Stoughton	864	Burlington	2.94	Bedford	0.86	Wellesley	0.29	Melrose	1.90
Melrose	27,236	Stoughton	85	Dedham	832	Wellesley	2.94	Randolph	0.86	Milton	0.28	Dedham	1.80
Milton	25,279	Milton	83	Norwood	763	Needham	2.90	Dedham	0.80	Dedham	0.27	Natick	1.80
Reading	24,751	Norwood	83	Milton	747	Dedham	2.87	Burlington	0.78	Watertown	0.26	Wakefield	1.70
Wakefield	24,687	Winchester	83	Winchester	747	Stoneham	2.73	Stoneham	0.78	Needham	0.20	Wellesley	1.70
Belmont	24,537	Bedford	78	Bedford	738	Natick	2.71	Natick	0.72	Randolph	0.19	Belmont	1.60
Burlington	24,507	Belmont	78	Belmont	708	Belmont	2.54	Needham	0.70	Winchester	0.19	Stoneham	1.60
Dedham	23,650	Westwood	77	Westwood	693	Reading	2.52	Reading	0.68	Natick	0.18	Stoughton	1.50
Winchester	21,572	Watertown	75	Everett	686	Canton	2.43	Milton	0.66	Stoughton	0.18	Canton	1.40
Stoneham	21,269	Melrose	74	Watertown	675	Milton	2.36	Chelsea	0.63	Chelsea	0.16	Burlington	1.40
Stoughton	18,191	Ashland	66	Melrose	641	Stoughton	2.28	Winthrop	0.62	Winthrop	0.16	Canton	1.40
Winthrop	17,737	Stoneham	63	Chelsea	618	Bedford	2.26	Bedford	0.59	Belmont	0.14	Winthrop	1.30
Walpole	17,448	Canton	62	Ashland	594	Winchester	1.89	Winchester	0.59	Winchester	0.12	Stoughton	1.20
Canton	14,459	Walpole	59	Walpole	577	Winthrop	1.86	Watertown	0.56	Bedford	0.10	Bedford	1.10
Westwood	13,985	Everett	57	Canton	567	Walpole	1.68	Hingham	0.44	Hingham	0.10	Winthrop	1.10
Ashland	12,743	Chelsea	41	Stoneham	567	Westwood	1.20	Walpole	0.39	Walpole	0.09	Ashland	0.80
Bedford	12,379	Winthrop	36	Winthrop	324	Wilmington	1.18	Wilmington	0.34	Westwood	0.08	Westwood	0.80
Holbrook	9,557	Hingham	33	Holbrook	312	Ashland	1.10	Westwood	0.32	Ashland	0.05	Wilmington	0.80
Hingham	6,652	Holbrook	31	Hingham	297	Hingham	1.04	Hingham	0.25	Holbrook	0.05	Hingham	0.50
Wilmington	4,196	Wilmington	20	Wilmington	280	Holbrook	0.73	Holbrook	0.18	Wilmington	0.04	Holbrook	0.50
<b>Total</b>	<b>2,134,528</b>	<b>Total</b>	<b>5,318</b>	<b>Total</b>	<b>59,857</b>	<b>Total</b>	<b>278</b>	<b>Total</b>	<b>68</b>	<b>Total</b>	<b>33</b>	<b>Total</b>	<b>177</b>
<b>Average</b>	<b>49,640</b>	<b>Average</b>	<b>124</b>	<b>Average</b>	<b>1,392</b>	<b>Average</b>	<b>6</b>	<b>Average</b>	<b>2</b>	<b>Average</b>	<b>1</b>	<b>Average</b>	<b>4</b>

TABLE 3 - 2012 Final Community Wastewater Flow Component Estimates (Ranked Detail page 3 of 3)

Community	ADF (GPD Per IDM)	Community	I/I (GPD Per IDM)	Community	Infiltration (GPD Per IDM)	Community	Inflow (GPD Per IDM)	Community	Inflow (GPD Per Sewer Mile)	Community	Average Sanitary (GPD Per Sew. Pop.)
Malden	8,170	Brookline	3,116	Brookline	2,402	Chelsea	1,521	Chelsea	22,927	Wilmington	191
Everett	7,434	Melrose	3,105	Melrose	2,293	Melrose	1,260	Cambridge	19,392	Woburn	119
Chelsea	7,071	Malden	2,970	Malden	2,230	Cambridge	1,212	Somerville	18,906	Bedford	105
Cambridge	6,630	Chelsea	2,540	Winthrop	1,914	Medford	867	BWSC	13,904	Cambridge	104
Brookline	6,344	Newton	2,406	Newton	1,886	Everett	845	Revere	11,795	Waltham	98
BWSC	6,229	Winthrop	2,346	Norwood	1,756	Melrose	811	Everett	10,175	Canton	97
Medford	6,150	Everett	2,332	Canton	1,534	Malden	740	Medford	8,673	BWSC	93
Melrose	6,069	Norwood	2,320	Everett	1,487	Brookline	713	Brookline	8,559	Braintree	92
Waltham	5,957	Medford	2,159	Hingham	1,481	Brookline	713	Malden	7,400	Quincy	91
Quincy	5,842	Somerville	2,141	Wakefield	1,419	Revere	642	Melrose	7,070	Malden	87
Winthrop	5,741	BWSC	2,093	Braintree	1,408	Stoneham	617	Stoneham	5,556	Norwood	85
Norwood	5,465	Stoneham	1,993	Stoneham	1,376	Norwood	564	Newton	5,203	Everett	83
Newton	4,989	Cambridge	1,985	Revere	1,297	Newton	520	Norwood	5,181	Stoughton	82
Somerville	4,901	Revere	1,939	Medford	1,292	Belmont	508	Waltham	4,855	Newton	82
Stoneham	4,815	Braintree	1,831	BWSC	1,242	Waltham	486	Belmont	4,615	Burlington	82
Watertown	4,622	Hingham	1,818	Quincy	1,233	Arlington	461	Arlington	4,151	Medford	79
Woburn	4,610	Canton	1,817	Wilmington	1,214	Winthrop	432	Quincy	4,010	Chelsea	79
Revere	4,449	Wakefield	1,802	Bedford	1,165	Braintree	423	Braintree	3,929	Lexington	79
Arlington	4,298	Quincy	1,634	Waltham	1,123	Quincy	401	Winthrop	3,889	Dedham	76
Braintree	4,292	Waltham	1,609	Woburn	1,113	Watertown	385	Wakefield	3,656	Stoughton	75
Canton	4,286	Arlington	1,562	Arlington	1,101	Wakefield	383	Woburn	3,546	Hingham	75
Wilmington	4,214	Woburn	1,468	Reading	1,088	Milton	375	Watertown	3,467	Brookline	73
Wakefield	3,727	Wilmington	1,357	Weymouth	1,025	Woburn	355	Milton	3,373	Watertown	71
Belmont	3,588	Belmont	1,342	Chelsea	1,019	Hingham	337	Hingham	3,226	Needham	71
Hingham	3,502	Bedford	1,301	Dedham	962	Dedham	325	Dedham	3,034	Weymouth	71
Dedham	3,450	Reading	1,296	Milton	910	Canton	282	Canton	2,581	Melrose	70
Milton	3,159	Dedham	1,286	Lexington	896	Winchester	254	Weymouth	2,437	Somerville	69
Bedford	3,062	Milton	1,285	Somerville	880	Weymouth	244	Winchester	2,289	Frammingham	69
Reading	2,917	Weymouth	1,269	Belmont	833	Wellesley	223	Wellesley	2,231	Wakefield	69
Walpole	2,912	Watertown	1,215	Watertown	830	Reading	208	Wilmington	2,000	Walpole	69
Weymouth	2,824	Lexington	1,083	Winchester	790	Lexington	187	Lexington	1,941	Revere	69
Randolph	2,680	Winchester	1,044	Cambridge	773	Randolph	167	Randolph	1,881	Belmont	65
Stoughton	2,639	Wellesley	954	Stoughton	764	Needham	162	Reading	1,875	Ashland	63
Burlington	2,557	Randolph	923	Randolph	756	Holbrook	160	Stoughton	1,667	Winthrop	62
Winchester	2,530	Stoughton	903	Wellesley	731	Walpole	156	Holbrook	1,613	Wellesley	62
Lexington	2,445	Walpole	832	Burlington	678	Natick	153	Needham	1,527	Randolph	62
Needham	2,354	Burlington	817	Walpole	676	Wilmington	143	Walpole	1,525	Natick	61
Holbrook	2,340	Natick	763	Natick	610	Burlington	139	Natick	1,452	Arlington	61
Natick	2,297	Holbrook	737	Holbrook	577	Stoughton	139	Burlington	1,391	Westwood	57
Wellesley	2,262	Needham	731	Needham	568	Bedford	136	Frammingham	1,309	Reading	57
Frammingham	2,058	Westwood	577	Westwood	462	Frammingham	131	Bedford	1,282	Milton	55
Ashland	1,852	Ashland	505	Ashland	421	Westwood	115	Westwood	1,039	Holbrook	52
Westwood	1,732	Frammingham	495	Frammingham	364	Ashland	84	Ashland	758	Winchester	51
Total											
Average	4,174	Average	1,574	Average	1,130	Average	445	Average	5,146	Average	78

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Annual Average (MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Ashland	Average Daily Flow	1.32	1.23	1.17	1.04	1.10	1.01	0.86	0.89	0.99	1.14	1.21	1.25	1.10
	Dry Day Average Daily Flow	1.24	1.18	1.13	0.98	1.08	0.92	0.85	0.87	0.95	1.10	1.14	1.12	1.05
	Estimated Infiltration	0.44	0.38	0.33	0.18	0.28	0.12	0.05	0.07	0.15	0.30	0.34	0.32	0.25
	Estimated Sanitary Flow	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	Estimated Inflow	0.08	0.05	0.04	0.06	0.02	0.09	0.01	0.02	0.04	0.04	0.07	0.13	0.05
Boston (South Only)	Raw Average Daily Flow	25.40	20.64	21.36	19.82	23.45	19.10	18.01	18.67	17.09	14.54	14.56	19.08	19.32
	Raw Dry Day Average Daily Flow	22.86	19.95	20.80	18.41	20.02	16.86	16.23	17.36	16.27	9.75	11.79	11.67	16.82
	Raw Estimated Infiltration	14.86	11.95	12.80	10.41	12.02	8.86	8.23	9.36	8.27	1.75	3.79	3.67	8.82
	MWRA Estimated Infiltration	6.21	4.99	5.35	4.35	5.02	3.70	3.44	3.91	3.46	0.73	1.58	1.53	3.69
	Final Average Daily Flow	19.19	15.65	16.01	15.47	18.43	15.40	14.57	14.76	13.63	13.81	12.98	17.55	15.63
	Final Dry Day Average Daily Flow	16.65	14.96	15.45	14.06	15.00	13.16	12.79	13.45	12.81	9.02	10.21	10.14	13.14
	Final Estimated Infiltration	8.65	6.96	7.45	6.06	7.00	5.16	4.79	5.45	4.81	1.02	2.21	2.14	5.14
	Estimated Sanitary Flow	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
	Estimated Inflow	2.54	0.69	0.56	1.41	3.43	2.24	1.78	1.31	0.82	4.79	2.77	7.41	2.50
Braintree	Raw Average Daily Flow	7.53	6.65	6.71	5.77	6.61	6.10	4.70	4.99	4.61	4.96	5.78	6.66	5.92
	Raw Dry Day Average Daily Flow	6.97	6.35	6.34	5.11	6.18	5.58	4.60	3.89	4.45	4.72	5.18	5.07	5.37
	Raw Estimated Infiltration	3.77	3.15	3.14	1.91	2.98	2.38	1.40	0.69	1.25	1.52	1.98	1.87	2.17
	MWRA Estimated Infiltration	0.59	0.49	0.49	0.30	0.47	0.37	0.22	0.11	0.20	0.24	0.31	0.29	0.34
	Final Average Daily Flow	6.94	6.16	6.22	5.47	6.14	5.73	4.48	4.88	4.41	4.72	5.47	6.37	5.58
	Final Dry Day Average Daily Flow	6.38	5.86	5.85	4.81	5.71	5.21	4.38	3.78	4.25	4.48	4.87	4.78	5.03
	Final Estimated Infiltration	3.18	2.66	2.65	1.61	2.51	2.01	1.18	0.58	1.05	1.28	1.67	1.58	1.83
	Estimated Sanitary Flow	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
	Estimated Inflow	0.56	0.30	0.37	0.66	0.43	0.52	0.10	1.10	0.16	0.24	0.60	1.59	0.55
Brookline (South Only)	Average Daily Flow	5.68	4.84	4.99	4.12	5.02	4.62	3.69	3.46	3.47	4.19	4.52	6.57	4.60
	Dry Day Average Daily Flow	4.44	4.47	4.47	3.37	4.59	4.14	3.64	3.28	3.06	3.46	3.93	3.78	3.89
	Estimated Infiltration	2.14	2.17	2.17	1.07	2.29	1.84	1.34	0.98	0.76	1.16	1.63	1.48	1.59
	Estimated Sanitary Flow	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
	Estimated Inflow	1.24	0.37	0.52	0.75	0.43	0.48	0.05	0.18	0.41	0.73	0.59	2.79	0.72
Canton	Raw Average Daily Flow	3.05	2.70	2.53	2.49	2.71	2.41	2.07	2.17	2.27	2.45	2.75	3.07	2.56
	Raw Dry Day Average Daily Flow	2.86	2.56	2.42	2.27	2.54	2.29	1.99	2.08	2.20	2.39	2.56	2.56	2.39
	Raw Estimated Infiltration	1.46	1.16	1.02	0.87	1.14	0.89	0.59	0.68	0.80	0.99	1.16	1.16	0.99
	MWRA Estimated Infiltration	0.19	0.15	0.13	0.11	0.14	0.11	0.08	0.09	0.10	0.13	0.15	0.15	0.13
	Final Average Daily Flow	2.86	2.55	2.40	2.38	2.57	2.30	1.99	2.08	2.17	2.32	2.60	2.92	2.43
	Final Dry Day Average Daily Flow	2.67	2.41	2.29	2.16	2.40	2.18	1.91	1.99	2.10	2.26	2.41	2.41	2.27
	Final Estimated Infiltration	1.27	1.01	0.89	0.76	1.00	0.78	0.51	0.59	0.70	0.86	1.01	1.01	0.87
	Estimated Sanitary Flow	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	Estimated Inflow	0.19	0.14	0.11	0.22	0.17	0.12	0.08	0.09	0.07	0.06	0.19	0.51	0.16
Dedham	Average Daily Flow	3.44	3.24	3.20	2.79	3.23	2.79	2.34	2.39	2.16	2.29	2.93	3.63	2.87
	Dry Day Average Daily Flow	3.17	3.07	3.01	2.42	3.02	2.58	2.21	2.24	2.04	2.13	2.68	2.65	2.60
	Estimated Infiltration	1.37	1.27	1.21	0.62	1.22	0.78	0.41	0.44	0.24	0.33	0.88	0.85	0.80
	Estimated Sanitary Flow	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
	Estimated Inflow	0.27	0.17	0.19	0.37	0.21	0.21	0.13	0.15	0.12	0.16	0.25	0.98	0.27



Table 4 - Estimated Community Wastewater Flow Components for 2012

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Annual  
Average  
(MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Framingham	Raw Average Daily Flow	6.56	5.85	5.89	5.44	5.87	5.17	4.56	4.67	4.70	5.89	6.60	6.77	5.67	
	Raw Dry Day Average Daily Flow	6.07	5.66	5.64	4.97	5.54	4.88	4.49	4.49	4.55	5.62	5.99	5.81	5.31	
	Raw Estimated Infiltration	1.77	1.36	1.34	0.67	1.24	0.58	0.19	0.19	0.25	1.32	1.69	1.51	1.01	
	MWRA Estimated Infiltration	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.02	0.01
	Final Average Daily Flow	6.54	5.84	5.88	5.43	5.86	5.16	4.56	4.67	4.70	5.88	6.58	6.75	5.66	
	Final Dry Day Average Daily Flow	6.05	5.65	5.63	4.96	5.53	4.87	4.49	4.49	4.55	5.61	5.97	5.79	5.30	
	Final Estimated Infiltration	1.75	1.35	1.33	0.66	1.23	0.57	0.19	0.19	0.25	1.31	1.67	1.49	1.00	
	Estimated Sanitary Flow	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Estimated Inflow	0.49	0.19	0.25	0.47	0.33	0.29	0.07	0.18	0.15	0.27	0.61	0.96	0.36		
Hingham	Average Daily Flow	1.33	1.13	1.17	0.97	1.16	1.08	0.84	0.82	0.77	0.84	1.02	1.38	1.04	
	Dry Day Average Daily Flow	1.18	1.05	1.09	0.87	1.09	1.00	0.80	0.75	0.74	0.81	0.95	0.94	0.94	
	Estimated Infiltration	0.68	0.55	0.59	0.37	0.59	0.50	0.30	0.25	0.24	0.31	0.45	0.44	0.44	
	Estimated Sanitary Flow	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
	Estimated Inflow	0.15	0.08	0.08	0.10	0.07	0.08	0.04	0.07	0.03	0.03	0.07	0.44	0.10	
Holbrook	Average Daily Flow	0.76	0.69	0.71	0.68	0.75	0.71	0.59	0.57	0.64	0.69	0.89	1.04	0.73	
	Dry Day Average Daily Flow	0.70	0.64	0.67	0.63	0.70	0.66	0.57	0.55	0.59	0.66	0.84	0.91	0.68	
	Estimated Infiltration	0.20	0.14	0.17	0.13	0.20	0.16	0.07	0.05	0.09	0.16	0.34	0.41	0.18	
	Estimated Sanitary Flow	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
	Estimated Inflow	0.06	0.05	0.04	0.05	0.05	0.05	0.02	0.02	0.05	0.03	0.05	0.13	0.05	
Milton (South Only)	Average Daily Flow	2.98	2.39	2.47	2.15	2.54	2.11	1.59	1.62	1.50	1.61	1.99	2.83	2.15	
	Dry Day Average Daily Flow	2.59	2.23	2.26	1.70	2.21	1.84	1.44	1.51	1.41	1.50	1.91	1.92	1.88	
	Estimated Infiltration	1.34	0.98	1.01	0.45	0.96	0.59	0.19	0.26	0.16	0.25	0.66	0.67	0.63	
	Estimated Sanitary Flow	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	
	Estimated Inflow	0.39	0.16	0.21	0.45	0.33	0.27	0.15	0.11	0.09	0.11	0.08	0.91	0.27	
Natick	Average Daily Flow	3.33	2.95	2.93	2.62	2.91	2.63	2.33	2.29	2.18	2.36	2.87	3.06	2.71	
	Dry Day Average Daily Flow	3.13	2.83	2.84	2.39	2.76	2.47	2.23	2.26	2.08	2.18	2.59	2.49	2.52	
	Estimated Infiltration	1.33	1.03	1.04	0.59	0.96	0.67	0.43	0.46	0.28	0.38	0.79	0.69	0.72	
	Estimated Sanitary Flow	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	
	Estimated Inflow	0.20	0.12	0.09	0.23	0.15	0.16	0.10	0.03	0.10	0.18	0.28	0.57	0.18	
Needham	Average Daily Flow	3.37	3.10	3.00	2.80	3.43	2.98	2.45	2.47	2.41	2.36	3.07	3.38	2.90	
	Dry Day Average Daily Flow	3.07	3.03	2.83	2.52	3.31	2.78	2.37	2.45	2.29	2.17	2.85	2.72	2.70	
	Estimated Infiltration	1.07	1.03	0.83	0.52	1.31	0.78	0.37	0.45	0.29	0.17	0.85	0.72	0.70	
	Estimated Sanitary Flow	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
	Estimated Inflow	0.30	0.07	0.17	0.28	0.12	0.20	0.08	0.02	0.12	0.19	0.22	0.66	0.20	
Newton (South Only)	Average Daily Flow	11.50	9.66	9.66	8.44	9.44	7.84	6.53	6.48	5.82	6.87	8.18	10.72	8.43	
	Dry Day Average Daily Flow	10.07	9.23	9.05	7.74	8.65	6.97	5.71	6.18	5.73	6.38	7.19	6.74	7.47	
	Estimated Infiltration	6.07	5.23	5.05	3.74	4.65	2.97	1.71	2.18	1.73	2.38	3.19	2.74	3.47	
	Estimated Sanitary Flow	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
	Estimated Inflow	1.43	0.43	0.61	0.70	0.79	0.87	0.82	0.30	0.09	0.49	0.99	3.98	0.96	

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Norwood	Raw Average Daily Flow	5.38	4.87	5.22	4.17	5.00	4.29	3.45	3.53	3.32	3.66	4.77	5.30	4.41	
	Raw Dry Day Average Daily Flow	4.71	4.69	4.98	3.55	4.55	4.05	3.33	3.29	3.22	3.32	4.08	4.06	3.98	
	Raw Estimated Infiltration	2.31	2.29	2.58	1.15	2.15	1.65	0.93	0.89	0.82	0.92	1.68	1.66	1.58	
	MWRA Estimated Infiltration	0.36	0.36	0.40	0.18	0.34	0.26	0.15	0.14	0.13	0.14	0.26	0.26	0.25	
	Final Average Daily Flow	5.02	4.51	4.82	3.99	4.66	4.03	3.30	3.39	3.19	3.52	4.51	5.04	4.17	
	Final Dry Day Average Daily Flow	4.35	4.33	4.58	3.37	4.21	3.79	3.18	3.15	3.09	3.18	3.82	3.80	3.74	
	Final Estimated Infiltration	1.95	1.93	2.18	0.97	1.81	1.39	0.78	0.75	0.69	0.78	1.42	1.40	1.34	
	Estimated Sanitary Flow	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
	Estimated Inflow	0.67	0.18	0.24	0.62	0.45	0.24	0.12	0.24	0.10	0.34	0.69	1.24	0.43	
Quincy	Average Daily Flow	13.58	12.25	12.13	11.93	12.82	12.78	10.98	11.13	10.10	10.30	10.96	12.60	11.80	
	Dry Day Average Daily Flow	12.86	12.12	11.62	10.95	12.03	11.79	10.19	10.35	9.77	10.00	9.98	10.25	10.99	
	Estimated Infiltration	4.36	3.62	3.12	2.45	3.53	3.29	1.69	1.85	1.27	1.50	1.48	1.75	2.49	
	Estimated Sanitary Flow	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	
	Estimated Inflow	0.72	0.13	0.51	0.98	0.79	0.99	0.79	0.78	0.33	0.30	0.98	2.35	0.81	
Randolph	Average Daily Flow	3.81	3.44	3.44	3.10	3.42	3.18	2.62	2.48	2.33	2.36	2.98	3.47	3.05	
	Dry Day Average Daily Flow	3.56	3.26	3.25	2.84	3.24	2.99	2.55	2.39	2.26	2.26	2.91	2.87	2.86	
	Estimated Infiltration	1.56	1.26	1.25	0.84	1.24	0.99	0.55	0.39	0.26	0.26	0.91	0.87	0.86	
	Estimated Sanitary Flow	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
	Estimated Inflow	0.25	0.18	0.19	0.26	0.18	0.19	0.07	0.09	0.07	0.10	0.07	0.60	0.19	
Stoughton	Raw Average Daily Flow	2.74	2.65	2.75	2.31	2.65	2.37	1.94	1.88	1.78	1.79	2.19	2.37	2.28	
	Raw Dry Day Average Daily Flow	2.59	2.60	2.64	2.09	2.52	2.24	1.92	1.81	1.74	1.71	2.10	2.00	2.16	
	Raw Estimated Infiltration	1.09	1.10	1.14	0.59	1.02	0.74	0.42	0.31	0.24	0.21	0.60	0.50	0.66	
	MWRA Estimated Infiltration	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Final Average Daily Flow	2.73	2.64	2.74	2.31	2.64	2.36	1.94	1.88	1.78	1.79	2.19	2.37	2.28	
	Final Dry Day Average Daily Flow	2.58	2.59	2.63	2.09	2.51	2.23	1.92	1.81	1.74	1.71	2.10	2.00	2.16	
	Final Estimated Infiltration	1.08	1.09	1.13	0.59	1.01	0.73	0.42	0.31	0.24	0.21	0.60	0.50	0.66	
	Estimated Sanitary Flow	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	
	Estimated Inflow	0.15	0.05	0.11	0.22	0.13	0.13	0.02	0.07	0.04	0.08	0.09	0.37	0.12	
Walpole	Average Daily Flow	1.99	1.81	1.71	1.64	1.77	1.58	1.33	1.35	1.42	1.54	2.01	2.00	1.68	
	Dry Day Average Daily Flow	1.90	1.78	1.68	1.57	1.69	1.50	1.29	1.26	1.36	1.38	1.89	1.80	1.59	
	Estimated Infiltration	0.70	0.58	0.48	0.37	0.49	0.30	0.09	0.06	0.16	0.18	0.69	0.60	0.39	
	Estimated Sanitary Flow	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	
	Estimated Inflow	0.09	0.03	0.03	0.07	0.08	0.08	0.04	0.09	0.06	0.16	0.12	0.20	0.09	
Wellesley	Average Daily Flow	3.65	3.29	3.20	2.89	3.39	2.76	2.24	2.31	2.34	2.62	3.14	3.49	2.94	
	Dry Day Average Daily Flow	3.28	3.14	2.97	2.51	3.20	2.48	2.04	2.19	2.22	2.39	2.75	2.64	2.65	
	Estimated Infiltration	1.58	1.44	1.27	0.81	1.50	0.78	0.34	0.49	0.52	0.69	1.05	0.94	0.95	
	Estimated Sanitary Flow	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	
	Estimated Inflow	0.37	0.15	0.23	0.38	0.19	0.28	0.20	0.12	0.12	0.23	0.39	0.85	0.29	
Westwood	Average Daily Flow	1.47	1.31	1.33	1.16	1.32	1.17	1.01	1.00	0.94	1.04	1.30	1.39	1.20	
	Dry Day Average Daily Flow	1.38	1.24	1.28	1.06	1.27	1.14	0.96	0.95	0.90	0.96	1.21	1.13	1.12	
	Estimated Infiltration	0.58	0.44	0.48	0.26	0.47	0.34	0.16	0.15	0.10	0.16	0.41	0.33	0.32	
	Estimated Sanitary Flow	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
	Estimated Inflow	0.09	0.07	0.05	0.10	0.05	0.03	0.05	0.05	0.04	0.08	0.09	0.26	0.08	

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average (MGD)	
Weymouth	Average Daily Flow	7.71	6.94	7.26	6.38	7.04	6.81	5.40	5.81	5.50	5.99	7.35	8.41	6.72	
	Dry Day Average Daily Flow	7.13	6.59	6.88	5.85	6.65	6.16	5.00	5.18	5.32	5.83	6.56	6.48	6.14	
	Estimated Infiltration	3.43	2.89	3.18	2.15	2.95	2.46	1.30	1.48	1.62	2.13	2.86	2.78	2.44	
	Estimated Sanitary Flow	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
	Estimated Inflow	0.58	0.35	0.38	0.53	0.39	0.65	0.40	0.63	0.18	0.16	0.79	1.93	0.58	
Subtotal (Southern System)	Raw Average Daily Flow	116.58	101.63	102.83	92.71	105.63	93.49	79.53	80.98	76.34	79.49	91.07	108.47	94.08	
	Raw Dry Day Average Daily Flow	105.76	97.67	97.85	83.80	96.84	85.32	74.41	75.33	73.15	70.72	81.08	79.61	85.11	
	Raw Estimated Infiltration	52.11	44.02	44.20	30.15	43.19	31.67	20.76	21.68	19.50	17.07	27.43	25.96	31.46	
	MWRA Estimated Infiltration	7.38	6.01	6.39	4.95	5.99	4.46	3.89	4.25	3.89	1.25	2.32	2.25	4.42	
	Final Average Daily Flow	109.20	95.62	96.44	87.76	99.64	89.03	75.64	76.73	72.45	78.24	88.75	106.22	89.67	
	Final Dry Day Average Daily Flow	98.38	91.66	91.46	78.85	90.85	80.86	70.52	71.08	69.26	69.47	78.76	77.36	80.69	
	Final Estimated Infiltration	44.73	38.01	37.81	25.20	37.20	27.21	16.87	17.43	15.61	15.82	25.11	23.71	27.04	
	Estimated Sanitary Flow	53.65	53.65	53.65	53.65	53.65	53.65	53.65	53.65	53.65	53.65	53.65	53.65	53.65	
	Estimated Inflow	10.82	3.96	4.98	8.91	8.79	8.17	5.12	5.65	3.19	8.77	9.99	28.86	8.98	
South System Pump Station as Reported by NPDES	Average Daily Flow	118.20	104.00	104.70	96.70	111.20	102.30	84.80	83.80	81.50	87.60	96.70	116.90	99.06	

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Arlington	Raw Average Daily Flow	5.32	4.81	4.77	3.98	4.62	4.30	3.10	3.29	3.12	3.49	3.94	4.95	4.14	
	Raw Dry Day Average Daily Flow	4.71	4.59	4.53	3.53	4.35	3.81	2.92	2.98	2.85	3.15	3.51	3.46	3.70	
	Raw Estimated Infiltration	2.11	1.99	1.93	0.93	1.75	1.21	0.32	0.38	0.25	0.55	0.91	0.86	1.10	
	MWRA Estimated Infiltration	0.08	0.08	0.08	0.04	0.07	0.05	0.01	0.01	0.01	0.02	0.04	0.03	0.04	
	Final Average Daily Flow	5.24	4.73	4.69	3.94	4.55	4.25	3.09	3.28	3.11	3.47	3.90	4.92	4.10	
	Final Dry Day Average Daily Flow	4.63	4.51	4.45	3.49	4.28	3.76	2.91	2.97	2.84	3.13	3.47	3.43	3.65	
	Final Estimated Infiltration	2.03	1.91	1.85	0.89	1.68	1.16	0.31	0.37	0.24	0.53	0.87	0.83	1.05	
	Estimated Sanitary Flow	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	
Estimated Inflow	0.61	0.22	0.24	0.45	0.27	0.49	0.18	0.31	0.27	0.34	0.43	1.49	0.44		
Bedford	Average Daily Flow	2.79	2.67	2.64	2.34	2.50	2.21	1.90	1.87	1.76	1.97	2.17	2.31	2.26	
	Dry Day Average Daily Flow	2.66	2.57	2.60	2.19	2.38	2.15	1.86	1.81	1.64	1.90	2.12	2.04	2.16	
	Estimated Infiltration	1.36	1.27	1.30	0.89	1.08	0.85	0.56	0.51	0.34	0.60	0.82	0.74	0.86	
	Estimated Sanitary Flow	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	Estimated Inflow	0.13	0.10	0.04	0.15	0.12	0.06	0.04	0.06	0.12	0.07	0.05	0.27	0.10	
Belmont	Average Daily Flow	3.35	2.77	2.50	2.30	2.82	2.68	2.06	2.17	1.96	2.20	2.48	3.21	2.54	
	Dry Day Average Daily Flow	2.76	2.58	2.20	2.12	2.59	2.37	1.89	2.01	1.75	1.88	2.14	1.96	2.19	
	Estimated Infiltration	1.16	0.98	0.60	0.52	0.99	0.77	0.29	0.41	0.15	0.28	0.54	0.36	0.59	
	Estimated Sanitary Flow	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	
	Estimated Inflow	0.59	0.19	0.30	0.18	0.23	0.31	0.17	0.16	0.21	0.32	0.34	1.25	0.36	
Boston (North Only)	Charlestown	Raw Average Daily Flow	2.87	2.33	2.92	3.22	3.40	4.02	3.14	3.07	3.71	3.34	2.98	4.43	3.29
		Raw Dry Day Average Daily Flow	2.47	2.08	2.57	2.72	2.86	3.02	2.63	2.73	2.78	2.88	2.44	2.77	2.66
		Raw Estimated Infiltration	1.07	0.68	1.17	1.32	1.46	1.62	1.23	1.33	1.38	1.48	1.04	1.37	1.26
		MWRA Estimated Infiltration	0.17	0.11	0.18	0.20	0.23	0.25	0.19	0.21	0.21	0.23	0.16	0.21	0.20
		Final Average Daily Flow	2.70	2.22	2.74	3.02	3.17	3.77	2.95	2.86	3.50	3.11	2.82	4.22	3.09
		Final Dry Day Average Daily Flow	2.30	1.97	2.39	2.52	2.63	2.77	2.44	2.52	2.57	2.65	2.28	2.56	2.47
		Final Estimated Infiltration	0.90	0.57	0.99	1.12	1.23	1.37	1.04	1.12	1.17	1.25	0.88	1.16	1.07
		Estimated Sanitary Flow	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
		Estimated Inflow	0.40	0.25	0.35	0.50	0.54	1.00	0.51	0.34	0.93	0.46	0.54	1.66	0.62
		Columbus Park	Raw Average Daily Flow	31.04	27.88	25.79	29.14	31.13	33.76	28.73	28.88	28.45	26.86	24.61	34.71
Raw Dry Day Average Daily Flow	25.63		24.65	23.16	23.59	27.08	24.78	24.85	24.64	23.14	21.24	21.65	22.56	23.92	
Raw Estimated Infiltration	5.63		4.65	3.16	3.59	7.08	4.78	4.85	4.64	3.14	1.24	1.65	2.56	3.92	
MWRA Estimated Infiltration	0.18		0.15	0.10	0.11	0.22	0.15	0.15	0.14	0.10	0.04	0.05	0.08	0.12	
Final Average Daily Flow	30.86		27.73	25.69	29.03	30.91	33.61	28.58	28.74	28.35	26.82	24.56	34.63	29.14	
Final Dry Day Average Daily Flow	25.45		24.50	23.06	23.48	26.86	24.63	24.70	24.50	23.04	21.20	21.60	22.48	23.79	
Final Estimated Infiltration	5.45		4.50	3.06	3.48	6.86	4.63	4.70	4.50	3.04	1.20	1.60	2.48	3.79	
Estimated Sanitary Flow	20.00		20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	
Estimated Inflow	5.41	3.23	2.63	5.55	4.05	8.98	3.88	4.24	5.31	5.62	2.96	12.15	5.34		
East Boston	Raw Average Daily Flow	7.42	5.53	6.67	5.86	6.02	6.40	5.49	5.47	5.76	5.58	6.32	7.52	6.17	
	Raw Dry Day Average Daily Flow	6.35	5.28	6.28	4.91	4.95	5.14	4.67	4.74	4.55	4.73	5.01	4.93	5.13	
	Raw Estimated Infiltration	2.75	1.68	2.68	1.31	1.35	1.54	1.07	1.14	0.95	1.13	1.41	1.33	1.53	
	MWRA Estimated Infiltration	0.26	0.16	0.25	0.12	0.13	0.14	0.10	0.11	0.09	0.10	0.13	0.12	0.14	
	Final Average Daily Flow	7.16	5.37	6.42	5.74	5.89	6.26	5.39	5.36	5.67	5.48	6.19	7.40	6.03	
	Final Dry Day Average Daily Flow	6.09	5.12	6.03	4.79	4.82	5.00	4.57	4.63	4.46	4.63	4.88	4.81	4.99	
	Final Estimated Infiltration	2.49	1.52	2.43	1.19	1.22	1.40	0.97	1.03	0.86	1.03	1.28	1.21	1.39	
	Estimated Sanitary Flow	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	
	Estimated Inflow	1.07	0.25	0.39	0.95	1.07	1.26	0.82	0.73	1.21	0.85	1.31	2.59	1.04	

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Annual  
Average  
(MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Ward Street	Raw Average Daily Flow	33.02	29.91	29.89	32.76	31.24	33.74	35.52	35.42	42.47	37.92	33.33	39.20	34.55
	Raw Dry Day Average Daily Flow	30.08	27.14	28.12	31.49	26.93	31.89	34.65	34.40	38.65	34.69	32.25	35.11	32.13
	Raw Estimated Infiltration	5.08	2.14	3.12	6.49	1.93	6.89	9.65	9.40	13.65	9.69	7.25	10.11	7.13
	MWRA Estimated Infiltration	0.78	0.33	0.48	1.00	0.30	1.06	1.48	1.44	2.09	1.49	1.11	1.55	1.09
	Final Average Daily Flow	32.24	29.58	29.41	31.76	30.94	32.68	34.04	33.98	40.38	36.43	32.22	37.65	33.45
	Final Dry Day Average Daily Flow	29.30	26.81	27.64	30.49	26.63	30.83	33.17	32.96	36.56	33.20	31.14	33.56	31.03
	Final Estimated Infiltration	4.30	1.81	2.64	5.49	1.63	5.83	8.17	7.96	11.56	8.20	6.14	8.56	6.03
	Estimated Sanitary Flow	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
	Estimated Inflow	2.94	2.77	1.77	1.27	4.31	1.85	0.87	1.02	3.82	3.23	1.08	4.09	2.42
Boston (North Total)	Raw Average Daily Flow	74.35	65.65	65.27	70.98	71.79	77.92	72.88	72.84	80.39	73.70	67.24	85.86	73.27
	Raw Dry Day Average Daily Flow	64.53	59.15	60.13	62.71	61.82	64.83	66.80	66.51	69.12	63.54	61.35	65.37	63.84
	Raw Estimated Infiltration	14.53	9.15	10.13	12.71	11.82	14.83	16.80	16.51	19.12	13.54	11.35	15.37	13.84
	MWRA Estimated Infiltration	1.39	0.75	1.01	1.43	0.88	1.60	1.92	1.90	2.49	1.86	1.45	1.96	1.56
	Final Average Daily Flow	72.96	64.90	64.26	69.55	70.91	76.32	70.96	70.94	77.90	71.84	65.79	83.90	71.72
	Final Dry Day Average Daily Flow	63.14	58.40	59.12	61.28	60.94	63.23	64.88	64.61	66.63	61.68	59.90	63.41	62.28
	Final Estimated Infiltration	13.14	8.40	9.12	11.28	10.94	13.23	14.88	14.61	16.63	11.68	9.90	13.41	12.28
	Estimated Sanitary Flow	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
	Estimated Inflow	9.82	6.50	5.14	8.27	9.97	13.09	6.08	6.33	11.27	10.16	5.89	20.49	9.43
Brookline (North Only)	Average Daily Flow	4.26	4.13	4.27	4.22	4.50	4.30	4.01	3.88	3.74	3.03	2.80	3.05	3.85
	Dry Day Average Daily Flow	3.90	3.96	4.13	3.90	4.24	4.04	3.99	3.74	3.44	2.78	2.75	2.53	3.62
	Estimated Infiltration	1.90	1.96	2.13	1.90	2.24	2.04	1.99	1.74	1.44	0.78	0.75	0.53	1.62
	Estimated Sanitary Flow	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	Estimated Inflow	0.36	0.17	0.14	0.32	0.26	0.26	0.02	0.14	0.30	0.25	0.05	0.52	0.23
Burlington	Average Daily Flow	3.70	3.41	3.37	2.98	3.34	3.03	2.39	2.43	2.30	2.45	2.74	3.12	2.94
	Dry Day Average Daily Flow	3.44	3.31	3.32	2.75	3.16	2.84	2.35	2.34	2.25	2.38	2.60	2.61	2.78
	Estimated Infiltration	1.44	1.31	1.32	0.75	1.16	0.84	0.35	0.34	0.25	0.38	0.60	0.61	0.78
	Estimated Sanitary Flow	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	Estimated Inflow	0.26	0.10	0.05	0.23	0.18	0.19	0.04	0.09	0.05	0.07	0.14	0.51	0.16
Cambridge	Raw Average Daily Flow	15.99	14.26	14.60	15.19	16.86	17.58	15.37	14.99	16.29	17.00	14.20	19.89	16.03
	Raw Dry Day Average Daily Flow	12.74	13.49	12.95	12.08	14.40	14.71	13.62	13.51	12.58	13.16	12.35	12.35	13.16
	Raw Estimated Infiltration	1.74	2.49	1.95	1.08	3.40	3.71	2.62	2.51	1.58	2.16	1.35	1.35	2.16
	MWRA Estimated Infiltration	0.26	0.38	0.30	0.16	0.52	0.56	0.40	0.38	0.24	0.33	0.21	0.21	0.33
	Final Average Daily Flow	15.73	13.88	14.30	15.03	16.34	17.02	14.97	14.61	16.05	16.67	13.99	19.68	15.70
	Final Dry Day Average Daily Flow	12.48	13.11	12.65	11.92	13.88	14.15	13.22	13.13	12.34	12.83	12.14	12.14	12.83
	Final Estimated Infiltration	1.48	2.11	1.65	0.92	2.88	3.15	2.22	2.13	1.34	1.83	1.14	1.14	1.83
	Estimated Sanitary Flow	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
	Estimated Inflow	3.25	0.77	1.65	3.11	2.46	2.87	1.75	1.48	3.71	3.84	1.85	7.54	2.87
Chelsea	Raw Average Daily Flow	4.89	4.00	4.20	4.36	4.64	4.90	3.97	4.00	4.31	4.21	3.87	5.94	4.44
	Raw Dry Day Average Daily Flow	3.79	3.67	3.64	3.43	3.70	3.82	3.30	3.42	3.30	3.52	3.28	3.19	3.50
	Raw Estimated Infiltration	0.99	0.87	0.84	0.63	0.90	1.02	0.50	0.62	0.50	0.72	0.48	0.39	0.70
	MWRA Estimated Infiltration	0.11	0.10	0.09	0.07	0.10	0.11	0.05	0.07	0.05	0.08	0.05	0.04	0.08
	Final Average Daily Flow	4.78	3.90	4.11	4.29	4.54	4.79	3.92	3.93	4.26	4.13	3.82	5.90	4.37
	Final Dry Day Average Daily Flow	3.68	3.57	3.55	3.36	3.60	3.71	3.25	3.35	3.25	3.44	3.23	3.15	3.43
	Final Estimated Infiltration	0.88	0.77	0.75	0.56	0.80	0.91	0.45	0.55	0.45	0.64	0.43	0.35	0.63
	Estimated Sanitary Flow	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
	Estimated Inflow	1.10	0.33	0.56	0.93	0.94	1.08	0.67	0.58	1.01	0.69	0.59	2.75	0.94

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average (MGD)
Everett	Average Daily Flow	5.66	5.14	5.37	5.27	5.65	5.47	4.46	4.37	4.55	4.49	4.49	6.24	5.10
	Dry Day Average Daily Flow	4.92	4.80	5.02	4.68	5.15	4.78	4.10	4.14	4.10	4.11	4.12	4.30	4.52
	Estimated Infiltration	1.42	1.30	1.52	1.18	1.65	1.28	0.60	0.64	0.60	0.61	0.62	0.80	1.02
	Estimated Sanitary Flow	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
	Estimated Inflow	0.74	0.34	0.35	0.59	0.50	0.69	0.36	0.23	0.45	0.38	0.37	1.94	0.58
Lexington	Raw Average Daily Flow	5.95	5.47	5.33	4.54	5.37	4.86	3.37	3.20	3.12	3.45	4.41	4.98	4.50
	Raw Dry Day Average Daily Flow	5.51	5.18	5.26	4.11	5.09	4.52	3.30	3.13	2.91	3.29	4.05	3.80	4.18
	Raw Estimated Infiltration	3.11	2.78	2.86	1.71	2.69	2.12	0.90	0.73	0.51	0.89	1.65	1.40	1.78
	MWRA Estimated Infiltration	0.34	0.31	0.32	0.19	0.30	0.23	0.10	0.08	0.06	0.10	0.18	0.15	0.20
	Final Average Daily Flow	5.61	5.16	5.01	4.35	5.07	4.63	3.27	3.12	3.06	3.35	4.23	4.83	4.31
	Final Dry Day Average Daily Flow	5.17	4.87	4.94	3.92	4.79	4.29	3.20	3.05	2.85	3.19	3.87	3.65	3.98
	Final Estimated Infiltration	2.77	2.47	2.54	1.52	2.39	1.89	0.80	0.65	0.45	0.79	1.47	1.25	1.58
	Estimated Sanitary Flow	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
	Estimated Inflow	0.44	0.29	0.07	0.43	0.28	0.34	0.07	0.07	0.21	0.16	0.36	1.18	0.33
	Malden	Raw Average Daily Flow	9.54	8.63	8.66	8.14	8.95	8.98	7.73	7.79	7.27	7.40	8.09	10.14
Raw Dry Day Average Daily Flow		8.62	8.19	8.11	7.37	8.51	8.30	7.29	7.41	7.02	6.99	7.53	7.15	7.71
Raw Estimated Infiltration		3.42	2.99	2.91	2.17	3.31	3.10	2.09	2.21	1.82	1.79	2.33	1.95	2.51
MWRA Estimated Infiltration		0.37	0.33	0.32	0.24	0.36	0.34	0.23	0.24	0.20	0.19	0.25	0.21	0.27
Final Average Daily Flow		9.17	8.30	8.34	7.90	8.59	8.64	7.50	7.55	7.07	7.21	7.84	9.93	8.17
Final Dry Day Average Daily Flow		8.25	7.86	7.79	7.13	8.15	7.96	7.06	7.17	6.82	6.80	7.28	6.94	7.43
Final Estimated Infiltration		3.05	2.66	2.59	1.93	2.95	2.76	1.86	1.97	1.62	1.60	2.08	1.74	2.23
Estimated Sanitary Flow		5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20
Estimated Inflow	0.92	0.44	0.55	0.77	0.44	0.68	0.44	0.38	0.25	0.41	0.56	2.99	0.74	
Medford	Raw Average Daily Flow	7.97	6.86	7.18	6.87	7.93	7.78	6.14	6.03	5.81	6.55	7.17	9.69	7.17
	Raw Dry Day Average Daily Flow	7.02	6.34	6.49	5.93	7.22	6.71	5.57	5.55	5.14	5.91	6.41	5.92	6.18
	Raw Estimated Infiltration	2.52	1.84	1.99	1.43	2.72	2.21	1.07	1.05	0.64	1.41	1.91	1.42	1.68
	MWRA Estimated Infiltration	0.33	0.24	0.26	0.19	0.36	0.29	0.14	0.14	0.08	0.19	0.25	0.19	0.22
	Final Average Daily Flow	7.64	6.62	6.92	6.68	7.57	7.49	6.00	5.89	5.73	6.36	6.92	9.50	6.95
	Final Dry Day Average Daily Flow	6.69	6.10	6.23	5.74	6.86	6.42	5.43	5.41	5.06	5.72	6.16	5.73	5.96
	Final Estimated Infiltration	2.19	1.60	1.73	1.24	2.36	1.92	0.93	0.91	0.56	1.22	1.66	1.23	1.46
	Estimated Sanitary Flow	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
	Estimated Inflow	0.95	0.52	0.69	0.94	0.71	1.07	0.57	0.48	0.67	0.64	0.76	3.77	0.98
Melrose	Raw Average Daily Flow	5.20	4.18	4.56	3.80	4.75	4.62	3.46	3.51	3.32	3.70	4.31	5.48	4.24
	Raw Dry Day Average Daily Flow	4.59	3.81	4.35	3.16	4.51	4.10	3.13	3.24	3.05	3.59	3.77	3.41	3.73
	Raw Estimated Infiltration	2.69	1.91	2.45	1.26	2.61	2.20	1.23	1.34	1.15	1.69	1.87	1.51	1.83
	MWRA Estimated Infiltration	0.52	0.37	0.48	0.25	0.51	0.43	0.24	0.26	0.22	0.33	0.36	0.29	0.36
	Final Average Daily Flow	4.68	3.81	4.08	3.55	4.24	4.19	3.22	3.25	3.10	3.37	3.95	5.19	3.89
	Final Dry Day Average Daily Flow	4.07	3.44	3.87	2.91	4.00	3.67	2.89	2.98	2.83	3.26	3.41	3.12	3.37
	Final Estimated Infiltration	2.17	1.54	1.97	1.01	2.10	1.77	0.99	1.08	0.93	1.36	1.51	1.22	1.47
	Estimated Sanitary Flow	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
Estimated Inflow	0.61	0.37	0.21	0.64	0.24	0.52	0.33	0.27	0.27	0.11	0.54	2.07	0.52	
Milton (North Only)	Average Daily Flow	0.32	0.26	0.24	0.21	0.20	0.18	0.17	0.17	0.18	0.20	0.20	0.24	0.21
	Dry Day Average Daily Flow	0.31	0.25	0.23	0.19	0.18	0.18	0.17	0.17	0.17	0.19	0.20	0.21	0.20
	Estimated Infiltration	0.16	0.10	0.08	0.04	0.03	0.03	0.02	0.02	0.02	0.04	0.05	0.06	0.05
	Estimated Sanitary Flow	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
	Estimated Inflow	0.01	0.01	0.01	0.02	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.03	0.01

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Annual  
Average  
(MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Newton (North Only)	Average Daily Flow	7.17	5.80	5.25	4.41	5.14	4.94	4.03	4.58	4.32	4.55	5.04	5.84	5.09	
	Dry Day Average Daily Flow	6.69	5.55	5.02	3.94	5.00	4.39	3.59	4.30	4.08	4.17	4.67	4.36	4.65	
	Estimated Infiltration	3.69	2.55	2.02	0.94	2.00	1.39	0.59	1.30	1.08	1.17	1.67	1.36	1.65	
	Estimated Sanitary Flow	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	Estimated Inflow	0.48	0.25	0.23	0.47	0.14	0.55	0.44	0.28	0.24	0.38	0.37	1.48	0.44	
Reading	Average Daily Flow	3.25	2.85	2.95	2.46	2.85	2.60	2.00	1.93	1.84	2.08	2.45	2.98	2.52	
	Dry Day Average Daily Flow	3.06	2.69	2.86	2.20	2.70	2.32	1.95	1.92	1.76	2.06	2.31	2.22	2.34	
	Estimated Infiltration	1.66	1.29	1.46	0.80	1.30	0.92	0.55	0.52	0.36	0.66	0.91	0.82	0.94	
	Estimated Sanitary Flow	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	
	Estimated Inflow	0.19	0.16	0.09	0.26	0.15	0.28	0.05	0.01	0.08	0.02	0.14	0.76	0.18	
Revere	Average Daily Flow	6.93	5.91	6.26	6.24	6.69	7.09	6.25	6.03	5.85	5.74	5.56	7.97	6.38	
	Dry Day Average Daily Flow	5.43	5.54	5.82	5.63	6.27	5.72	5.35	5.45	5.18	5.18	4.88	5.10	5.46	
	Estimated Infiltration	1.83	1.94	2.22	2.03	2.67	2.12	1.75	1.85	1.58	1.58	1.28	1.50	1.86	
	Estimated Sanitary Flow	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	
	Estimated Inflow	1.50	0.37	0.44	0.61	0.42	1.37	0.90	0.58	0.67	0.56	0.68	2.87	0.92	
Somerville	Raw Average Daily Flow	10.44	8.38	9.14	9.68	10.80	10.06	7.94	8.04	9.58	9.29	8.24	12.66	9.53	
	Raw Dry Day Average Daily Flow	7.15	7.49	7.54	6.82	8.05	7.61	6.47	6.46	6.52	6.84	7.04	7.31	7.11	
	Raw Estimated Infiltration	1.85	2.19	2.24	1.52	2.75	2.31	1.17	1.16	1.22	1.54	1.74	2.01	1.81	
	MWRA Estimated Infiltration	0.12	0.15	0.15	0.10	0.19	0.16	0.08	0.08	0.08	0.10	0.12	0.14	0.12	
	Final Average Daily Flow	10.32	8.23	8.99	9.58	10.61	9.90	7.86	7.96	9.50	9.19	8.12	12.52	9.41	
	Final Dry Day Average Daily Flow	7.03	7.34	7.39	6.72	7.86	7.45	6.39	6.38	6.44	6.74	6.92	7.17	6.99	
	Final Estimated Infiltration	1.73	2.04	2.09	1.42	2.56	2.15	1.09	1.08	1.14	1.44	1.62	1.87	1.69	
	Estimated Sanitary Flow	5.30	5.30	5.30	5.30	5.30	5.30	5.30	5.30	5.30	5.30	5.30	5.30	5.30	
	Estimated Inflow	3.29	0.89	1.60	2.86	2.75	2.45	1.47	1.58	3.06	2.45	1.20	5.35	2.42	
Stoneham	Raw Average Daily Flow	3.58	3.34	3.21	2.76	3.52	3.09	2.39	2.19	2.02	2.30	2.89	3.71	2.92	
	Raw Dry Day Average Daily Flow	3.15	3.17	3.06	2.43	3.09	2.75	2.34	2.03	1.86	2.07	2.44	2.38	2.56	
	Raw Estimated Infiltration	1.55	1.57	1.46	0.83	1.49	1.15	0.74	0.43	0.26	0.47	0.84	0.78	0.96	
	MWRA Estimated Infiltration	0.30	0.30	0.28	0.16	0.28	0.22	0.14	0.08	0.05	0.09	0.16	0.15	0.18	
	Final Average Daily Flow	3.28	3.04	2.93	2.60	3.24	2.87	2.25	2.11	1.97	2.21	2.73	3.56	2.73	
	Final Dry Day Average Daily Flow	2.85	2.87	2.78	2.27	2.81	2.53	2.20	1.95	1.81	1.98	2.28	2.23	2.38	
	Final Estimated Infiltration	1.25	1.27	1.18	0.67	1.21	0.93	0.60	0.35	0.21	0.38	0.68	0.63	0.78	
	Estimated Sanitary Flow	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	
	Estimated Inflow	0.43	0.17	0.15	0.33	0.43	0.34	0.05	0.16	0.16	0.23	0.45	1.33	0.35	
Wakefield	Raw Average Daily Flow	4.27	3.84	3.92	3.17	3.88	3.50	2.58	2.53	2.27	2.58	3.19	4.00	3.31	
	Raw Dry Day Average Daily Flow	3.95	3.62	3.69	2.74	3.67	3.09	2.41	2.37	2.13	2.47	2.82	2.65	2.97	
	Raw Estimated Infiltration	2.25	1.92	1.99	1.04	1.97	1.39	0.71	0.67	0.43	0.77	1.12	0.95	1.27	
	MWRA Estimated Infiltration	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Final Average Daily Flow	4.26	3.83	3.91	3.17	3.87	3.49	2.58	2.53	2.27	2.58	3.19	4.00	3.31	
	Final Dry Day Average Daily Flow	3.94	3.61	3.68	2.74	3.66	3.08	2.41	2.37	2.13	2.47	2.82	2.65	2.96	
	Final Estimated Infiltration	2.24	1.91	1.98	1.04	1.96	1.38	0.71	0.67	0.43	0.77	1.12	0.95	1.26	
	Estimated Sanitary Flow	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	
	Estimated Inflow	0.32	0.22	0.23	0.43	0.21	0.41	0.17	0.16	0.14	0.11	0.37	1.35	0.34	

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Waltham	Raw Average Daily Flow	9.57	8.96	8.81	8.02	8.88	8.15	6.97	7.60	7.20	7.61	8.32	9.44	8.29
	Raw Dry Day Average Daily Flow	8.62	8.54	8.40	7.34	8.34	7.63	6.87	6.90	6.81	7.07	7.53	7.46	7.62
	Raw Estimated Infiltration	2.62	2.54	2.40	1.34	2.34	1.63	0.87	0.90	0.81	1.07	1.53	1.46	1.62
	MWRA Estimated Infiltration	0.12	0.12	0.11	0.06	0.11	0.08	0.04	0.04	0.04	0.05	0.07	0.07	0.08
	Final Average Daily Flow	9.45	8.84	8.70	7.96	8.77	8.07	6.93	7.56	7.16	7.56	8.25	9.37	8.22
	Final Dry Day Average Daily Flow	8.50	8.42	8.29	7.28	8.23	7.55	6.83	6.86	6.77	7.02	7.46	7.39	7.55
	Final Estimated Infiltration	2.50	2.42	2.29	1.28	2.23	1.55	0.83	0.86	0.77	1.02	1.46	1.39	1.55
	Estimated Sanitary Flow	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
	Estimated Inflow	0.95	0.42	0.41	0.68	0.54	0.52	0.10	0.70	0.39	0.54	0.79	1.98	0.67
Watertown	Average Daily Flow	3.68	3.39	3.39	2.91	3.21	3.15	2.61	2.78	2.72	2.87	3.06	3.65	3.12
	Dry Day Average Daily Flow	3.26	3.27	3.18	2.69	3.06	2.91	2.53	2.65	2.52	2.70	2.83	2.70	2.86
	Estimated Infiltration	0.96	0.97	0.88	0.39	0.76	0.61	0.23	0.35	0.22	0.40	0.53	0.40	0.56
	Estimated Sanitary Flow	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
	Estimated Inflow	0.42	0.12	0.21	0.22	0.15	0.24	0.08	0.13	0.20	0.17	0.23	0.95	0.26
Wilmington	Average Daily Flow	1.28	1.28	1.28	1.13	1.35	1.19	1.03	1.14	1.07	1.15	1.16	1.11	1.18
	Dry Day Average Daily Flow	1.26	1.26	1.24	1.09	1.21	1.16	1.02	1.10	1.03	1.14	1.11	1.10	1.14
	Estimated Infiltration	0.46	0.46	0.44	0.29	0.41	0.36	0.22	0.30	0.23	0.34	0.31	0.30	0.34
	Estimated Sanitary Flow	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	Estimated Inflow	0.02	0.02	0.04	0.04	0.14	0.03	0.01	0.04	0.04	0.01	0.05	0.01	0.04
Winchester	Average Daily Flow	2.49	2.21	2.15	1.75	2.15	1.93	1.37	1.46	1.38	1.50	1.81	2.43	1.89
	Dry Day Average Daily Flow	2.21	2.07	2.05	1.56	2.00	1.74	1.33	1.36	1.28	1.38	1.65	1.68	1.69
	Estimated Infiltration	1.11	0.97	0.95	0.46	0.90	0.64	0.23	0.26	0.18	0.28	0.55	0.58	0.59
	Estimated Sanitary Flow	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Estimated Inflow	0.28	0.14	0.10	0.19	0.15	0.19	0.04	0.10	0.10	0.12	0.16	0.75	0.19
Winthrop	Average Daily Flow	2.09	1.81	1.88	1.93	1.89	2.07	1.71	1.71	1.67	1.66	1.73	2.13	1.86
	Dry Day Average Daily Flow	2.04	1.73	1.83	1.86	1.83	1.80	1.58	1.60	1.57	1.59	1.55	1.61	1.72
	Estimated Infiltration	0.94	0.63	0.73	0.76	0.73	0.70	0.48	0.50	0.47	0.49	0.45	0.51	0.62
	Estimated Sanitary Flow	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Estimated Inflow	0.05	0.08	0.05	0.07	0.06	0.27	0.13	0.11	0.10	0.07	0.18	0.52	0.14
Woburn	Raw Average Daily Flow	8.20	7.66	8.42	6.90	7.17	6.83	4.78	5.76	5.33	5.88	6.27	7.93	6.76
	Raw Dry Day Average Daily Flow	7.35	7.41	8.05	6.29	6.70	6.63	4.48	5.17	5.16	5.63	6.17	6.16	6.26
	Raw Estimated Infiltration	2.85	2.91	3.55	1.79	2.20	2.13	0.78	0.67	0.66	1.13	1.67	1.66	1.83
	MWRA Estimated Infiltration	0.41	0.41	0.51	0.25	0.31	0.30	0.11	0.10	0.09	0.16	0.24	0.24	0.26
	Final Average Daily Flow	7.79	7.25	7.91	6.65	6.86	6.53	4.67	5.66	5.24	5.72	6.03	7.69	6.50
	Final Dry Day Average Daily Flow	6.94	7.00	7.54	6.04	6.39	6.33	4.37	5.07	5.07	5.47	5.93	5.92	6.00
	Final Estimated Infiltration	2.44	2.50	3.04	1.54	1.89	1.83	0.67	0.57	0.57	0.97	1.43	1.42	1.57
	Estimated Sanitary Flow	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.43
	Estimated Inflow	0.85	0.25	0.37	0.61	0.47	0.20	0.30	0.59	0.17	0.25	0.10	1.77	0.50



Table 4 - Estimated Community Wastewater Flow Components for 2012

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Annual  
Average  
(MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Subtotal (Northern System)	Raw Average Daily Flow	212.24	187.67	189.62	186.54	201.45	203.41	174.67	176.29	183.37	181.05	177.83	228.95	191.99	
	Raw Dry Day Average Daily Flow	183.67	174.23	175.70	162.74	179.22	174.91	160.21	161.27	159.22	158.69	161.18	163.03	167.84	
	Raw Estimated Infiltration	60.32	50.88	52.35	39.39	55.87	51.56	37.66	37.92	35.87	35.34	37.83	39.68	44.56	
	MWRA Estimated Infiltration	4.36	3.55	3.92	3.14	4.00	4.38	3.46	3.38	3.61	3.50	3.38	3.68	3.70	
	Final Average Daily Flow	207.88	184.12	185.70	183.40	197.45	199.03	171.21	172.91	179.76	177.55	174.45	225.27	188.29	
	Final Dry Day Average Daily Flow	179.31	170.68	171.78	159.60	175.22	170.53	156.75	157.89	155.61	155.19	157.80	159.35	164.14	
	Final Estimated Infiltration	55.96	47.33	48.43	36.25	51.87	47.18	34.20	34.54	32.26	31.84	34.45	36.00	40.86	
	Estimated Sanitary Flow	123.35	123.35	123.35	123.35	123.35	123.35	123.35	122.55	123.35	123.35	123.35	123.35	123.35	123.28
	Estimated Inflow	28.57	13.44	13.92	23.80	22.23	28.50	14.46	15.02	24.15	22.36	16.65	65.92	24.15	
Total (North and South)	Raw Average Daily Flow	328.82	289.30	292.45	279.25	307.08	296.90	254.20	257.27	259.71	260.54	268.90	337.42	286.08	
	Raw Dry Day Average Daily Flow	289.43	271.90	273.55	246.54	276.06	260.23	234.62	236.60	232.37	229.41	242.26	242.64	252.95	
	Raw Estimated Infiltration	112.43	94.90	96.55	69.54	99.06	83.23	58.42	59.60	55.37	52.41	65.26	65.64	76.02	
	MWRA Estimated Infiltration	11.74	9.56	10.31	8.09	9.99	8.84	7.35	7.63	7.50	4.75	5.70	5.93	8.11	
	Final Average Daily Flow	317.08	279.74	282.14	271.16	297.09	288.06	246.85	249.64	252.21	255.79	263.20	331.49	277.96	
	Final Dry Day Average Daily Flow	277.69	262.34	263.24	238.45	266.07	251.39	227.27	228.97	224.87	224.66	236.56	236.71	244.83	
	Final Estimated Infiltration	100.69	85.34	86.24	61.45	89.07	74.39	51.07	51.97	47.87	47.66	59.56	59.71	67.90	
	Estimated Sanitary Flow	177.00	177.00	177.00	177.00	177.00	177.00	176.20	177.00	177.00	177.00	177.00	177.00	176.93	
	Estimated Inflow	39.39	17.40	18.90	32.71	31.02	36.67	19.58	20.67	27.34	31.13	26.64	94.78	33.13	
North System as Reported by NPDES	Average Daily Flow	209.50	193.30	191.80	193.20	208.80	213.10	184.00	184.60	189.80	187.00	179.90	234.50	197.52	
Total System as Reported by NPDES	Average Daily Flow	327.70	297.30	296.50	289.90	320.00	315.40	268.80	268.40	271.30	274.60	276.60	351.40	296.58	

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Annual Average (MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Chelsea Creek	Average Daily Flow	99.75	84.58	87.19	81.58	91.98	87.95	67.01	63.75	65.66	77.11	78.14	95.67	81.72	
	Dry Day Average Daily Flow	90.06	78.27	80.94	67.69	83.78	70.42	59.39	59.64	56.40	68.87	71.03	59.28	70.48	
	Estimated Infiltration	41.26	29.47	32.14	18.89	34.98	21.62	11.39	10.84	7.60	20.07	22.23	10.48	21.75	
	Estimated Sanitary Flow	48.80	48.80	48.80	48.80	48.80	48.80	48.80	48.00	48.80	48.80	48.80	48.80	48.80	48.73
	Estimated Inflow	9.69	6.31	6.25	13.89	8.20	17.53	7.62	4.11	9.26	8.24	7.11	36.39	11.24	
Columbus Park	Average Daily Flow	31.73	28.31	26.28	29.73	31.75	34.44	29.26	29.49	29.05	27.42	24.97	35.64	29.85	
	Dry Day Average Daily Flow	26.04	25.22	23.52	23.85	27.60	25.08	25.17	24.87	23.41	21.52	21.94	22.86	24.26	
	Estimated Infiltration	5.89	5.07	3.37	3.70	7.45	4.93	5.02	4.72	3.26	1.37	1.79	2.71	4.11	
	Estimated Sanitary Flow	20.15	20.15	20.15	20.15	20.15	20.15	20.15	20.15	20.15	20.15	20.15	20.15	20.15	20.15
	Estimated Inflow	5.69	3.09	2.76	5.88	4.15	9.36	4.09	4.62	5.64	5.90	3.03	12.78	5.59	
Ward Street	Average Daily Flow	68.00	62.69	62.32	63.32	64.79	65.95	62.90	63.86	69.84	66.19	61.78	71.07	65.24	
	Dry Day Average Daily Flow	61.33	59.00	60.95	59.33	59.15	61.31	61.06	62.59	63.82	60.56	58.59	60.86	60.72	
	Estimated Infiltration	16.73	14.40	16.35	14.73	14.55	16.71	16.46	17.99	19.22	15.96	13.99	16.26	16.12	
	Estimated Sanitary Flow	44.60	44.60	44.60	44.60	44.60	44.60	44.60	44.60	44.60	44.60	44.60	44.60	44.60	
	Estimated Inflow	6.67	3.69	1.37	3.99	5.64	4.64	1.84	1.27	6.02	5.63	3.19	10.21	4.52	
Winthrop Terminal	Average Daily Flow	14.72	18.86	16.22	16.33	16.40	17.09	15.08	15.60	14.54	14.96	13.45	19.13	16.02	
	Dry Day Average Daily Flow	10.54	16.88	12.94	14.55	15.72	11.54	14.48	13.98	12.95	12.19	12.78	13.44	13.49	
	Estimated Infiltration	0.74	7.08	3.14	4.75	5.92	1.74	4.68	4.18	3.15	2.39	2.98	3.64	3.69	
	Estimated Sanitary Flow	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	
	Estimated Inflow	4.18	1.98	3.28	1.78	0.68	5.55	0.60	1.62	1.59	2.77	0.67	5.69	2.54	
Subtotal - Northern Headworks	Average Daily Flow	214.20	194.44	192.01	190.96	204.92	205.43	174.25	172.70	179.09	185.68	178.34	221.51	192.83	
	Dry Day Average Daily Flow	187.97	179.37	178.35	165.42	186.25	168.35	160.10	161.08	156.58	163.14	164.34	156.44	168.95	
	Estimated Infiltration	64.62	56.02	55.00	42.07	62.90	45.00	37.55	37.73	33.23	39.79	40.99	33.09	45.67	
	Estimated Sanitary Flow	123.35	123.35	123.35	123.35	123.35	123.35	123.35	122.55	123.35	123.35	123.35	123.35	123.28	
	Estimated Inflow	26.23	15.07	13.66	25.54	18.67	37.08	14.15	11.62	22.51	22.54	14.00	65.07	23.88	
Headworks as Reported by NPDES	SUM of ADF's	209.50	193.30	191.80	193.20	208.80	213.10	184.00	184.60	189.80	187.00	179.90	234.50	197.52	
Chelsea Creek	Average Daily Flow	99.90	86.40	87.80	83.30	95.50	95.30	75.70	75.90	76.00	78.10	79.50	108.00	86.82	
Columbus Park	Average Daily Flow	25.70	27.60	25.90	30.10	32.00	34.70	29.90	29.50	29.30	27.70	25.20	36.00	29.47	
Ward Street	Average Daily Flow	70.20	64.00	61.90	63.30	64.70	65.90	63.00	63.50	69.70	66.10	61.70	71.10	65.44	
Winthrop Terminal	Average Daily Flow	13.70	15.30	16.20	16.50	16.60	17.20	15.40	15.70	14.80	15.10	13.50	19.40	15.79	
Total System Flow  (Southern Collection System Plus Northern Headworks)	Raw Average Daily Flow	330.78	296.07	294.84	283.67	310.55	298.92	253.78	253.68	255.43	265.17	269.41	329.98	286.92	
	Raw Dry Day Average Daily Flow	293.73	277.04	276.20	249.22	283.09	253.67	234.51	236.41	229.73	233.86	245.42	236.05	254.06	
	Raw Estimated Infiltration	116.73	100.04	99.20	72.22	106.09	76.67	58.31	59.41	52.73	56.86	68.42	59.05	77.12	
	MWRA Estimated Infiltration	7.38	6.01	6.39	4.95	5.99	4.46	3.89	4.25	3.89	1.25	2.32	2.25	4.42	
	Final Average Daily Flow	323.40	290.06	288.45	278.72	304.56	294.46	249.89	249.43	251.54	263.92	267.09	327.73	282.50	
	Final Dry Day Average Daily Flow	286.35	271.03	269.81	244.27	277.10	249.21	230.62	232.16	225.84	232.61	243.10	233.80	249.64	
	Final Estimated Infiltration	109.35	94.03	92.81	67.27	100.10	72.21	54.42	55.16	48.84	55.61	66.10	56.80	72.71	
	Estimated Sanitary Flow	177.00	177.00	177.00	177.00	177.00	177.00	176.20	177.00	177.00	177.00	177.00	177.00	176.93	
	Estimated Inflow	37.05	19.03	18.64	34.45	27.46	45.25	19.27	17.27	25.70	31.31	23.99	93.93	32.86	

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Annual  
Average  
(MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Boston (Total)	Raw Average Daily Flow	99.75	86.29	86.63	90.80	95.24	97.02	90.89	91.51	97.48	88.24	81.80	104.94	92.59	
	Raw Dry Day Average Daily Flow	87.39	79.10	80.93	81.12	81.84	81.69	83.03	83.87	85.39	73.29	73.14	77.04	80.66	
	Raw Estimated Infiltration	29.39	21.10	22.93	23.12	23.84	23.69	25.03	25.87	27.39	15.29	15.14	19.04	22.66	
	MWRA Estimated Infiltration	7.60	5.74	6.36	5.78	5.90	5.30	5.36	5.81	5.95	2.59	3.03	3.49	5.24	
	Final Average Daily Flow	92.15	80.55	80.27	85.02	89.34	91.72	85.53	85.70	91.53	85.65	78.77	101.45	87.35	
	Final Dry Day Average Daily Flow	79.79	73.36	74.57	75.34	75.94	76.39	77.67	78.06	79.44	70.70	70.11	73.55	75.42	
	Final Estimated Infiltration	21.79	15.36	16.57	17.34	17.94	18.39	19.67	20.06	21.44	12.70	12.11	15.55	17.42	
	Estimated Sanitary Flow	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00
	Estimated Inflow	12.36	7.19	5.70	9.68	13.40	15.33	7.86	7.64	12.09	14.95	8.66	27.90	11.93	
Brookline (Total)	Average Daily Flow	9.94	8.97	9.26	8.34	9.52	8.92	7.70	7.34	7.21	7.22	7.32	9.62	8.45	
	Dry Day Average Daily Flow	8.34	8.43	8.60	7.27	8.83	8.18	7.63	7.02	6.50	6.24	6.68	6.31	7.50	
	Estimated Infiltration	4.04	4.13	4.30	2.97	4.53	3.88	3.33	2.72	2.20	1.94	2.38	2.01	3.20	
	Estimated Sanitary Flow	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	
	Estimated Inflow	1.60	0.54	0.66	1.07	0.69	0.74	0.07	0.32	0.71	0.98	0.64	3.31	0.95	
Milton (Total)	Average Daily Flow	3.30	2.65	2.71	2.36	2.74	2.29	1.76	1.79	1.68	1.81	2.19	3.07	2.36	
	Dry Day Average Daily Flow	2.90	2.48	2.49	1.89	2.39	2.02	1.61	1.68	1.58	1.69	2.11	2.13	2.08	
	Estimated Infiltration	1.50	1.08	1.09	0.49	0.99	0.62	0.21	0.28	0.18	0.29	0.71	0.73	0.68	
	Estimated Sanitary Flow	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	
	Estimated Inflow	0.40	0.17	0.22	0.47	0.35	0.27	0.15	0.11	0.10	0.12	0.08	0.94	0.28	
Newton (Total)	Average Daily Flow	18.67	15.46	14.91	12.85	14.58	12.78	10.56	11.06	10.14	11.42	13.22	16.56	13.52	
	Dry Day Average Daily Flow	16.76	14.78	14.07	11.68	13.65	11.36	9.30	10.48	9.81	10.55	11.86	11.10	12.11	
	Estimated Infiltration	9.76	7.78	7.07	4.68	6.65	4.36	2.30	3.48	2.81	3.55	4.86	4.10	5.11	
	Estimated Sanitary Flow	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	
	Estimated Inflow	1.91	0.68	0.84	1.17	0.93	1.42	1.26	0.58	0.33	0.87	1.36	5.46	1.41	

Table 4 - Estimated Community Wastewater Flow Components for 2012

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Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Subtotal Northern System CSO Communities Only:	Raw Average Daily Flow	105.67	92.29	93.21	100.21	104.09	110.46	100.16	99.87	110.57	104.20	93.55	124.35	103.27
	Raw Dry Day Average Daily Flow	88.21	83.80	84.26	85.04	87.97	90.97	90.19	89.90	91.52	87.06	84.02	88.22	87.61
	Raw Estimated Infiltration	19.11	14.70	15.16	15.94	18.87	21.87	21.09	20.80	22.42	17.96	14.92	19.12	18.51
	MWRA Estimated Infiltration	1.88	1.38	1.55	1.76	1.69	2.43	2.45	2.43	2.86	2.37	1.83	2.35	2.08
[Sum of Boston (North), Cambridge, Chelsea, and Somerville]	Final Average Daily Flow	103.79	90.91	91.66	98.45	102.40	108.03	97.71	97.44	107.71	101.83	91.72	122.00	101.19
	Final Dry Day Average Daily Flow	86.33	82.42	82.71	83.28	86.28	88.54	87.74	87.47	88.66	84.69	82.19	85.87	85.53
	Final Estimated Infiltration	17.23	13.32	13.61	14.18	17.18	19.44	18.64	18.37	19.56	15.59	13.09	16.77	16.43
	Estimated Sanitary Flow	69.10	69.10	69.10	69.10	69.10	69.10	69.10	69.10	69.10	69.10	69.10	69.10	69.10
	Estimated Inflow	17.46	8.49	8.95	15.17	16.12	19.49	9.97	9.97	19.05	17.14	9.53	36.13	15.66
Subtotal Northern System Without North CSO Communities:	Raw Average Daily Flow	106.57	95.38	96.41	86.33	97.36	92.95	74.51	76.42	72.80	76.85	84.28	104.60	88.72
	Raw Dry Day Average Daily Flow	95.46	90.43	91.44	77.70	91.25	83.94	70.02	71.37	67.70	71.63	77.16	74.81	80.23
	Raw Estimated Infiltration	41.21	36.18	37.19	23.45	37.00	29.69	16.57	17.12	13.45	17.38	22.91	20.56	26.04
	MWRA Estimated Infiltration	2.48	2.17	2.37	1.38	2.31	1.95	1.01	0.95	0.75	1.13	1.55	1.33	1.61
	Final Average Daily Flow	104.09	93.21	94.04	84.95	95.05	91.00	73.50	75.47	72.05	75.72	82.73	103.27	87.10
	Final Dry Day Average Daily Flow	92.98	88.26	89.07	76.32	88.94	81.99	69.01	70.42	66.95	70.50	75.61	73.48	78.61
	Final Estimated Infiltration	38.73	34.01	34.82	22.07	34.69	27.74	15.56	16.17	12.70	16.25	21.36	19.23	24.43
	Estimated Sanitary Flow	54.25	54.25	54.25	54.25	54.25	54.25	53.45	54.25	54.25	54.25	54.25	54.25	54.18
	Estimated Inflow	11.11	4.95	4.97	8.63	6.11	9.01	4.49	5.05	5.10	5.22	7.12	29.79	8.49
Subtotal North/South Systems Without North CSO Communities:	Raw Average Daily Flow	223.15	197.01	199.24	179.04	202.99	186.44	154.04	157.40	149.14	156.34	175.35	213.07	182.80
	Raw Dry Day Average Daily Flow	201.22	188.10	189.29	161.50	188.09	169.26	144.43	146.70	140.85	142.35	158.24	154.42	165.33
	Raw Estimated Infiltration	93.32	80.20	81.39	53.60	80.19	61.36	37.33	38.80	32.95	34.45	50.34	46.52	57.50
	MWRA Estimated Infiltration	9.86	8.18	8.76	6.33	8.30	6.41	4.90	5.20	4.64	2.38	3.87	3.58	6.03
	Final Average Daily Flow	213.29	188.83	190.48	172.71	194.69	180.03	149.14	152.20	144.50	153.96	171.48	209.49	176.77
	Final Dry Day Average Daily Flow	191.36	179.92	180.53	155.17	179.79	162.85	139.53	141.50	136.21	139.97	154.37	150.84	159.30
	Final Estimated Infiltration	83.46	72.02	72.63	47.27	71.89	54.95	32.43	33.60	28.31	32.07	46.47	42.94	51.47
	Estimated Sanitary Flow	107.90	107.90	107.90	107.90	107.90	107.90	107.10	107.90	107.90	107.90	107.90	107.90	107.83
	Estimated Inflow	21.93	8.91	9.95	17.54	14.90	17.18	9.61	10.70	8.29	13.99	17.11	58.65	17.47