



# 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 24, 2012

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 2012**

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 2012.

- Attachment 1 – Overview of MWRA Regional I/I Reduction Plan
- Attachment 2 – MWRA Regional I/I Reduction Plan – FY12 Progress Update and Detailed Implementation Schedule for FY13 Activities
- Attachment 3 – MWRA Actions Taken to Reduce I/I During FY12
- 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 – CY11 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,

A handwritten signature in black ink, appearing to read "Michael J. Hornbrook".

Michael J. Hornbrook  
Chief Operating Officer

cc: MassDEP-Regulatory Branch, Boston  
MassDEP - SERO  
MassDEP – NERO  
Richard Chretien, MassDEP, Boston  
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 FY12  
Reporting Period – July 2011 Through June 2012

## 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 FY12  
Reporting Period – July 2011 Through June 2012

**MWRA REGIONAL I/I REDUCTION PLAN -  
FY12 PROGRESS UPDATE AND DETAILED  
IMPLEMENTATION SCHEDULE FOR FY13 ACTIVITIES**

This document provides a progress update for FY12 accomplishments and a description of the activities to be accomplished during FY12 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.

**During FY12, 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 FY12 are detailed in Attachment 3. Additional information on MWRA's FY12 maintenance activities is provided under separate submittal - NPDES Part I.18.g Annual Maintenance Status Sheets.**

**During FY13, 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.**

**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 July 2010, MassDEP developed a revised Reporting Form "Sanitary Sewer Overflow (SSO)/Bypass Notification Form (rev 07/2010)." As of August 2012, this form is available on the MassDEP web site and reporting using the form is via FAX or by mail. As of August 2012, 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.**

**MWRA utilizes MassDEP’s Sanitary Sewer Overflow (SSO)/Bypass Notification Form (rev 07/2010) 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 FY12, 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 FY13.**

**In FY12-13, MWRA is 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).**

**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 FY13, 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 previously noted, 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 is 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 previously noted, 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 FY12, 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 FY12, MWRA continued work on projects in the MWRA Capital Improvement Program, as summarized in Attachment 3.**

**During FY13, at the request of member communities, MWRA will continue to provide technical and financial assistance to member sewer communities. In FY12-13, MWRA is 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)

**As previously noted, 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 FY12, 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 FY13.**

**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 is 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.**

**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).

**During FY12, MWRA continued to estimate community infiltration and inflow rates on a bimonthly basis. Community wastewater flow data for CY11 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. Funds for the next phase of wastewater meter replacement/upgrade are programmed in MWRA's capital Improvement program during FY14-18.**

**During FY13, 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.**

**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)

**During FY12, 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. 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 FY13.**

*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. 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.**

*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)

**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 FY12, 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 \$14 million was distributed during FY12. Since program inception in May 1993, \$221 million has been distributed to fund 430 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 FY13, 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)

**During FY12, MWRA continued to provide emergency assistance to member communities, as requested. These efforts included internal TV inspection of 2.2 miles of local sewers and associated sewer cleaning, as well as, other emergency assistance. During FY13, 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)

**During FY12, MWRA distributed technical information to member community Public Works Directors, local wastewater/water system operators, and local watershed groups, including:**

- 1. May 6, 2011 MWRA staff provided an update presentation to the Wastewater Advisory Committee on MWRA wastewater metering, rate assessment methodologies, the I/I Local Financial Assistance Program, and wastewater flow data.**
- 2. August 9, 2011, November 1, 2011, and December 30, 2011 advisory letters were mailed to those communities with potential grant funds subject to the I/I Local Financial Assistance Program's Phase 5 sunset provisions to take effect as of June 30, 2012. The MWRA Advisory Board was copied on all letters. All I/I Local Financial Assistance Phase 5 funds were distributed to member communities prior to the sunset date.**
- 3. November 17, 2011 MWRA staff provided an update presentation to the MWRA Advisory Board and member community representatives on both I/I Local Financial Assistance and Local Pipeline and Water System Assistance Programs.**
- 4. January 25, 2012 announcement e-mail 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.**
- 5. March 6, 2012 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.**

6. **March 16, 2012 I/I Local Financial Assistance Program (45% grants and 55% interest-free 5-year loans) funding update for local sewer projects.**
7. **March 16, 2012 Local Pipeline and Water System Assistance Program funding (interest-free 10-year loans) update for local water projects.**
8. **July 17, 2012 annual community I/I questionnaire distributed to develop information on FY12 local I/I reduction programs to for development of MWRA's Annual I/I Reduction Report.**
9. **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.**

**During FY13, 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.**

**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)

**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 FY13, MWRA will continue to work cooperatively with MassDEP on this strategy.**

**On May 6, 2011 MWRA staff provided an update presentation to the Wastewater Advisory Committee on MWRA wastewater metering, rate assessment methodologies, the I/I Local Financial Assistance Program, and wastewater flow data.**

**On November 17, 2011 MWRA staff provided an update presentation to the MWRA Advisory Board and member community representatives on both I/I Local Financial Assistance and Local Pipeline and Water System Assistance Programs.**

*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.**

**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 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.**

**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 FY12, 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 complete.**

**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)

**During FY12, 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)

**During FY12, 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.**

**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. The Regional I/I Reduction plan is posted on MWRA's web site 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.**

**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.**

**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 FY12  
Reporting Period – July 2011 Through June 2012

## MWRA ACTIONS TAKEN TO REDUCE I/I DURING FY12

The MWRA Field Operations Department's Technical Inspection program staff have internally inspected approximately 33.5 miles of Authority-owned interceptors and 2.2 miles of community-owned sewers, internally inspected 53 inverted siphon barrels with sonar inspection equipment, and physically inspected 1097 sewer manholes and other structures (diversion chambers, siphon headhouses, tide gates, etc.) during FY12. 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 FY12, maintenance work included hydraulic/mechanical cleaning of 52.7 miles of Authority-owned sewers, 1.3 miles of community-owned sewers, and 86 siphon barrels, as well as, replacement of 145 manhole frames and covers. 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 FY12, 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 Project #1 through #7 for rehabilitation construction of a variety of Sewer Sections are programmed in the FY13 CIP at a cost of about \$40 million in FY14-22.
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 FY13 CIP at a cost of \$3.0 million in FY13-15. 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 FY13 CIP at a cost of \$5.0 million in FY14-19. The project will include rehabilitation of about 3,300 feet of 108-inch brick sewer that was rehabilitated using a shotcrete process in the 1990s.

4. Sewer asset protection rehabilitation 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 is being performed under a design/build agreement to expedite the rehabilitation. This project is programmed in the FY13 CIP at a cost of \$2.584 million in FY12. The sewer is a 120 years old brick 61-inch x 56-inch rounded horseshoe conduit. The cured-in-place lining project was completed in October 2011.
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 FY13 CIP at a cost of \$2.637 million in FY15-18. 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 FY13 CIP at a cost of \$8.5 million in FY18-20. 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 FY13 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 FY13 CIP at a cost of \$558,000 during FY12-13. 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 FY13 CIP at a cost of \$1.942 million during FY14-17.
7. Wastewater Process Optimization – Manhole Structure Flood Protection design and construction is programmed in the FY13 CIP at a cost of \$5.5 million during FY15-16 and FY18-20. 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. This project will follow-up on recommendations from the North System Hydraulic Capacity Study for hydraulic optimization projects in the North System tributary to Chelsea Creek Headworks. Planning should consider potential increases in flood elevations and tidal surge due to impacts from climate change.
8. 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 FY13 CIP at a cost of \$1.731 million during FY13-17. 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.

9. MWRA's \$862 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 FY12, \$755 million has been expended on MWRA's CSO Control Plan with additional projects scheduled for FY13-FY17

ATTACHMENT 4  
TO  
MWRA ANNUAL I/I REDUCTION REPORT FOR FY12  
Reporting Period – July 2011 Through June 2012

**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 FY12, \$221 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 funds has been approved through FY21. The table on page 3 provides a summary of funding distributions by fiscal quarter since inception of the Program.

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 JULY 2012**

Community	Total Allocations (Phases 1 - 8)	Total Distributions (Phases 1 - 8)	Percent Distributed	Funds Remaining
Arlington	\$5,613,000	\$4,893,000	87%	\$720,000
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	\$58,761,001	69%	\$26,824,199
Braintree	\$5,319,000	\$3,109,000	58%	\$2,210,000
Brookline	\$8,605,200	\$5,112,200	59%	\$3,493,000
Burlington	\$3,304,800	\$2,845,800	86%	\$459,000
Cambridge	\$15,566,100	\$9,777,055	63%	\$5,789,045
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	\$3,441,000	88%	\$473,000
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	\$3,355,399	74%	\$1,164,001
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	\$2,867,900	87%	\$424,000
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	\$6,358,500	88%	\$871,000
<b>Totals</b>	<b>\$300,750,000</b>	<b>\$221,109,465</b>	<b>74%</b>	<b>\$79,640,535</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
Total		\$44,777,078		\$45,963,058		\$51,039,978		\$79,329,351	\$221,109,465



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-three 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</u> <u>(\$ millions)</u>	<u>ONGOING PROJECTS</u> <u>(\$ millions)</u>	<u>TOTAL</u> <u>(\$ millions)</u>
Planning/Study:	\$ 32.1	\$ 3.6	\$ 35.7 (17%)
Design:	8.2	3.5	11.7 (5%)
Construction:	136.0	26.0	162.0 (73%)
Eng. Services During Const.:	9.9	1.8	11.7 (5%)
<b>TOTAL</b>	<b>\$186.2 (84%)</b>	<b>\$ 34.9 (16%)</b>	<b>\$ 221.1 (100%)</b>

### Program Results

The I/I Local Financial Assistance Program began in May 1993. Through FY12, a total of 430 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 FY12) for planning/inspection include the following:

- 1,323 miles of sewer TV inspected
- 932 miles of sewer flow isolated
- 1,084 miles of sewer smoke tested
- 35,550 sewer manholes inspected
- 58,000 buildings inspected

Results for all projects (FY93 through FY12) targeting infiltration reduction include the following:

- 46 miles sewer replaced
- 75 miles sewer CIP lined
- 133 miles sewer tested/chemically sealed
- 2,100 sewer spot repairs
- 7,370 service connection repairs
- 4.7 miles underdrains sealed

Results for all projects (FY93 through FY12) targeting inflow reduction include the following:

- 754 catch basins disconnected
- 34 miles of new or replaced storm drains
- 10,220 manholes rehabilitated/sealed
- 1,655 manhole covers replaced or inflow seals installed
- 415 sump pumps redirected
- 5,100 downspouts/area drains disconnected

## Estimated I/I Removal

The estimated average daily flow reduction associated with completed local I/I reduction projects that have received MWRA financial Assistance is about 80 mgd. This flow reduction “ballpark” figure is based on the communities’ (or their consultants’) peak I/I reduction estimates. MWRA staff have prorated the peak I/I reduction estimates to develop an estimated annual average I/I reduction. The estimated I/I removals noted here represent 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:

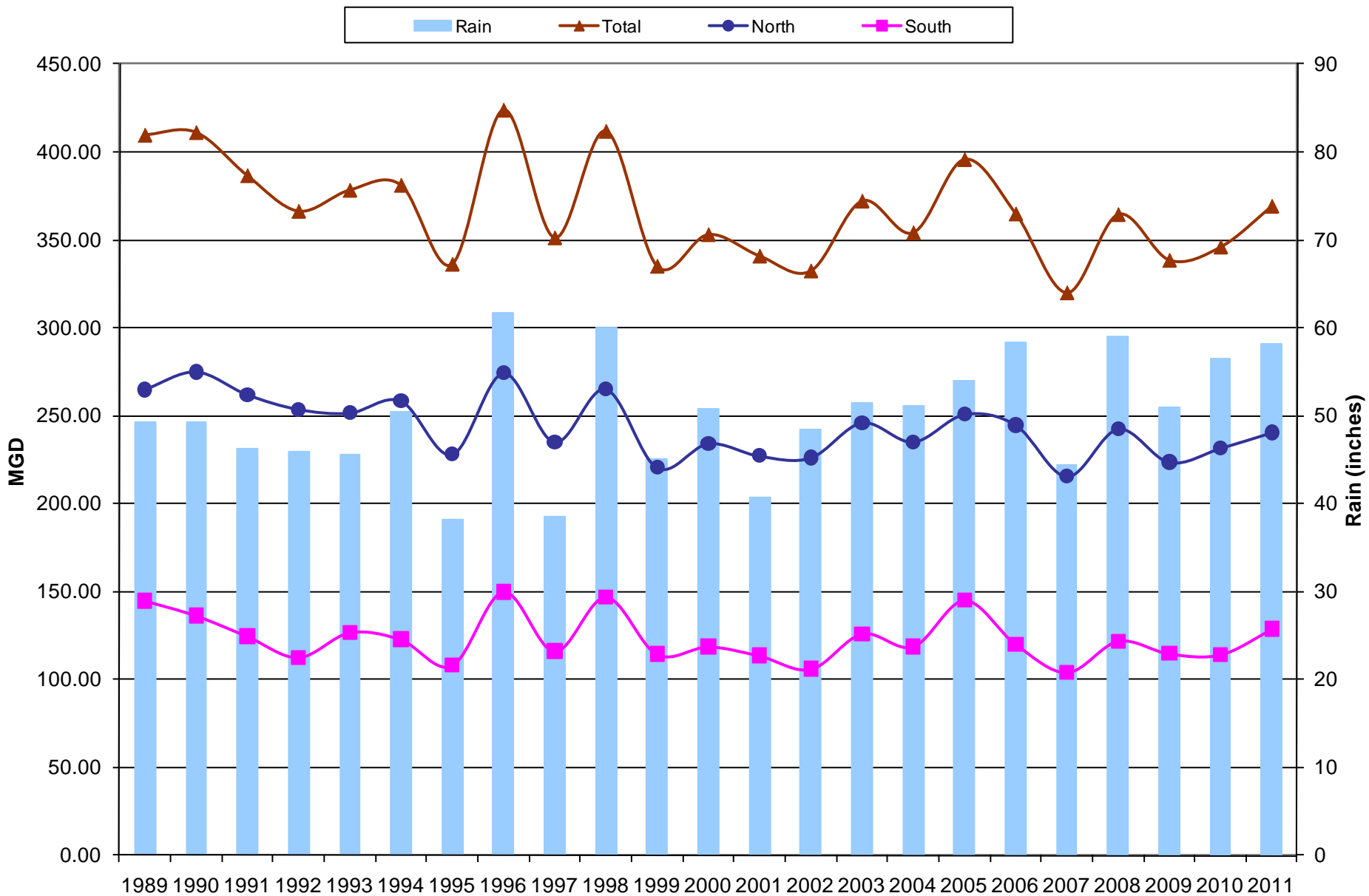
- Wastewater flows within the collection system vary dramatically due to changes in precipitation. For example, annual average daily flow for MWRA’s system varies up to 100 mgd from year to year (from a low of 320 mgd to a high of 420 mgd). Small flow reductions for individual projects (typically less than one mgd) are dwarfed by regional flow fluctuations.
- Sewer capacity gained by elimination of I/I in one sewer subsystem may allow I/I to enter the collection system at a different location, resulting in no net flow reduction at the end of the collection system.
- The consequence of ongoing pumping and interceptor upgrades, as well as combined sewer overflow and system optimization projects, is an increase in the capture and treatment of wastewater flow and reduction of raw sewage discharges prior to the treatment plant. These increased flows to the Deer Island Treatment Plant offset upstream I/I reductions.

Taking these factors into account, long-term metering records will continue to be analyzed to monitor regional wastewater flow trends. Accounting for annual rainfall fluctuations, the regional wastewater flow trend appears to be modestly declining as shown on the graph of MWRA Long-Term (21-years) Regional Flow Data presented on page 6. The same long-term regional flow and annual rainfall data is presented on page 7 recalculated as 5-year running averages. The 5-year running average smoothes the extremely high and extremely low year data. The 5-year running average data for total system flow and annual rainfall is presented again on page 8 in a smaller vertical scale (300 to 400 mgd flow and 40 to 60 inches of rain). The data show an approximate 40 mgd reduction in wastewater flow during the last 21 year period when annual rainfall totals for the metro-Boston area have increase about eight inches per year.

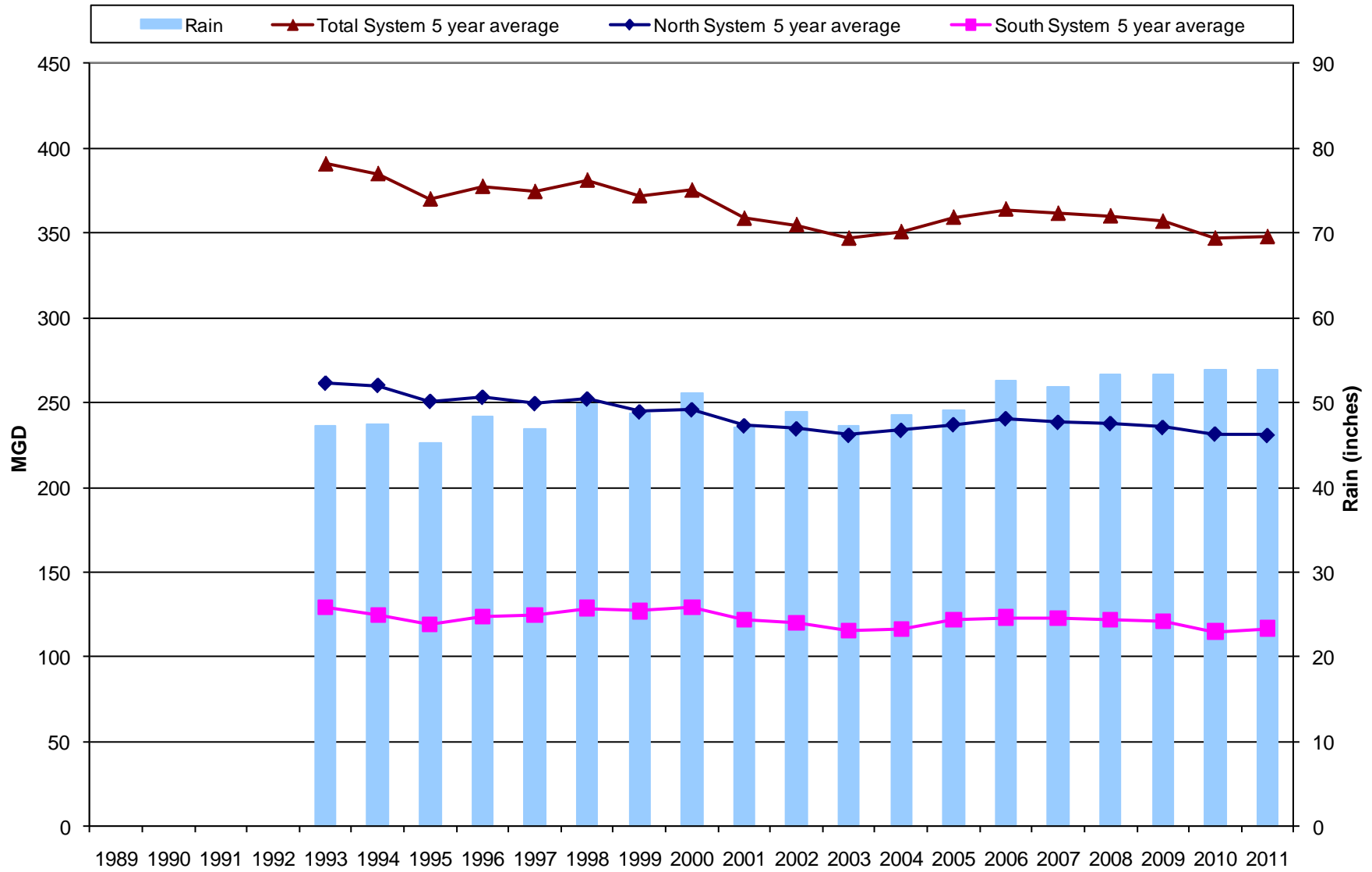
## Projects Funded During FY12

Local projects are funded quarterly by MWRA. Attached are funding summaries for the four quarterly funding distributions during FY12: August 2011 (five communities funded: Arlington, Burlington, Newton, Quincy, and Reading), November 2011 (four communities funded: Braintree, Brookline, Framingham, and Weymouth), February 2012 (three communities funded: Needham, Stoughton, and Westwood), and May 2012 (ten communities funded: Belmont, Holbrook, Natick, Somerville, Wakefield, Walpole, Watertown, Wellesley, Winchester, and Winthrop).

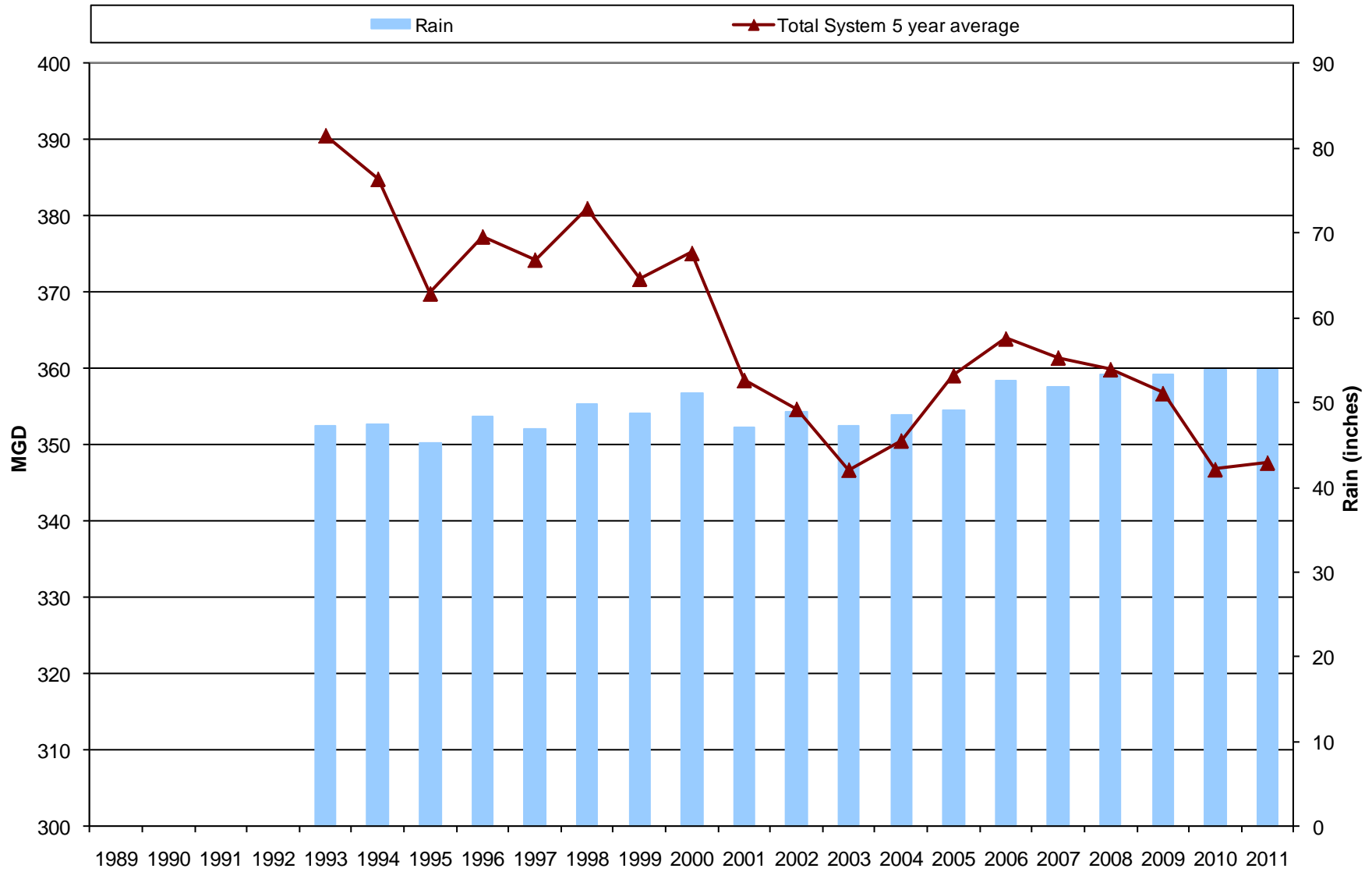
### MWRA Long-Term Regional Flow Data NOAA Rainfall Average at Three Local Sites (Logan, Blue Hills, Reading)



**MWRA Long-Term Regional Flow Data  
5-year Running Averages  
5 year running NOAA Rainfall Average at Three Local Sites (Logan, Blue Hills, Reading)**



**MWRA Long-Term Regional Flow Data  
5-year Running Averages  
5 year running NOAA Rainfall Average at Three Local Sites (Logan, Blue Hills, Reading)**



# MWRA I/I Local Financial Assistance Program Funding Summary

August 2011 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Arlington	\$ 185,600
Burlington	\$ 307,500
Newton	\$ 1,046,000
Quincy	\$ 1,752,000
Reading	\$ 404,000
Total	\$ 3,695,100

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-01-3-741**

**TOWN OF ARLINGTON**

**CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS  
PER YEAR #3 SSIPP STUDY**

**SCOPE OF SERVICES**

This sewer rehabilitation project (**Bid No. 11-24 Phase #3 Sanitary Sewer Rehabilitations**) is a result of the design for the Year #3 Sewer System Investigation Planning Program (SSIPP). The sewer rehabilitation work will mainly take place in Sewer Subareas BA, OY, 2, 5, 6, 15, 16, 25, 30, 33, 34, 49 & 53. This sewer rehabilitation contract will include a Base Bid and two (2) Alternate Bids. The Base Bid includes approximately: 5,301 linear feet of cured-in-place pipe; 75 linear feet of cured-in-place service connection liner; 210 linear feet of open cut point repair (at 6 locations); 1 open cut separation of sewer and drain; replacement of 50 linear feet of building connections; 1 installation of precast low-profile manhole including frame and cover; 1 installation of precast catch basin and drain manhole including frames and covers; 4 inflow dishes; 4 cuts of protruding service connections; 4,183 linear feet of chemical root treatment; root treatment of 1 sewer manhole; exterior grouting and interior sealing of 408 vertical feet of sewer manholes; raising of 2 manholes; 8,800 linear feet of post construction flow isolation; and other related tasks.

Alternate Bid No. 1 includes approximately: 1,359 linear feet of cured-in-place pipe; 5 linear feet of open cut point repair (at 1 location); 3 cuts of protruding service connections; exterior grouting and interior sealing of 77 vertical feet of sewer manholes; and other related tasks.

Alternate Bid No. 2 includes approximately: 143 linear feet of open cut point repair (at 6 locations); replacement of 60 linear feet of building connections; exterior grouting and interior sealing of 87 vertical feet of sewer manholes; 2,134 linear feet of cured-in-place pipe; 2 cuts of protruding service connection; and other related tasks.

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

The Year #3 Sewer System Investigation Planning Program (SSIPP) study was funded under MWRA Project #WRA-P6-01-3-605. The design of the recommended sewer rehabilitations per the Year #3 SSIPP study was funded under MWRA Project #WRA-P6-01-3-656.

**SUMMARY OF PROJECT COSTS**

Construction of Recommended Sewer Rehabilitations (Year #3 SSIPP)	\$ 383,600
Engineering Services During Construction of Year #3 SSIPP Rehabilitations	\$ 82,000
	-----
<b>TOTAL PROJECT COST</b>	<b>\$ 465,600</b>

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-01-3-741**

**TOWN OF ARLINGTON**

**CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS  
PER YEAR #3 SSIPP STUDY**

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction of Sewer Rehabilitations (Year #3)	August 2011	September 2012



**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-08-3-744**

**TOWN OF BURLINGTON**

**CONSTRUCTION OF PHASE 5 SEWER SYSTEM REHABILITATIONS PROJECT**

**SCOPE OF SERVICES**

This project will include the construction of the sewer rehabilitations as recommended by the Phase 4 SSES Report (June 2010), the Phase 5 Easement Manholes Inspections and the 100-Year Flood Plain Manhole Inflow Investigations. The specific sewer pipe rehabilitations will include but not be limited to: cleaning & CCTV inspection of sewer; joint testing & sealing of sewers; installation of cured-in-place short liners; and testing & grouting of sewer service laterals. This rehabilitation work is generally listed in Table E-3 of the Phase 4 SSES Report (June 2010).

The specific manhole rehabilitations will include but not be limited to: root treatment of manholes, cementitious lining of manholes and installation of manhole Inflow dishes. This rehabilitation work is generally listed in Tables 5 & 6 of the Draft Report entitled "Easement Manhole Inspections and Flood Plain Manhole Inflow Investigation" dated June 7, 2011.

The design, preparation of Contract Documents and Bid & Award services for this sewer and manhole rehabilitation project was funded under MWRA Project No. WRA-P7-08-2-738.

<u>DESCRIPTION OF WORK</u>	<u>ESTIMATED COST</u>
Construction of Phase 5 Sewer System Rehabilitations	\$ 420,356
Engineering Services During Construction	\$ 88,800
TOTAL ESTIMATED COST	<u>\$ 509,156 (1)</u>

NOTE: (1) Eligibility is being limited to the Town's remaining Phase 7 Funding amount of \$370,500. The Town intends to use funds from their Sewer Bank for the balance.

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
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FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P7-08-3-744

TOWN OF BURLINGTON

CONSTRUCTION OF PHASE 5 SEWER SYSTEM REHABILITATIONS PROJECT

PROJECT SCHEDULE

<u>Task Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Phase 5 Sewer Rehabilitation Construction	September 2011	December 2011
Re-testing & Warranty Inspection	March 2012	April 2012

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-24-3-743**

**CITY OF NEWTON**

**AREA B SEWER SYSTEM EVALUATION SURVEY (SSES) – PHASE II STUDY  
AND  
AREA B DESIGN & CONSTRUCTION OF PHASE IA RECOMMENDED SEWER  
REHABILITATIONS**

**SCOPE OF SERVICES**

**Area B Sewer System Evaluation Survey (SSES) – Phase II Study**

This Program will identify sources of infiltration and inflow (I/I) in Sewer Subareas B028, B030, B033, B056, B057, B061, B062, B063 & B064. The field work associated with this project will include, but not be limited to: conducting top side physical survey of approximately 715 sewer manholes for sources of I/I; conducting flow isolation of approximately 125,000 l.f. of sewer; cleaning and internal TV inspection of approximately 125,000 l.f. of sewer; updating of sewer mapping/GIS database; preparing draft and final report on the results of the field work which will include cost-effectiveness analysis and recommendations for sewer rehabilitation.

**Area B Design & Construction of Phase IA Recommended Sewer Rehabilitations**

This sewer rehabilitation project which includes the design and construction phases is a result of previous sewer investigation work. Under the Area B Phase I Sanitary Sewer Rehabilitation Project, internal TV inspection was performed in 32,500 lf of sewer. Review and preliminary design associated with recommended sewer rehabilitations is being completed under a separate project. The sewers that are recommended for rehabilitation will be included under the subject project.

The sewer defects in Subareas B007, B010 & B071 that were identified in the 2007 Sewer/Underdrain Investigation were not included for rehabilitation in the Area B Phase I Sanitary Sewer Rehabilitation Project. These sewer defects will be included under the subject project.

In March 2011, sewers tributary to the manhole located in the sidewalk at 27 Commonwealth Avenue were investigated to determine the source of contaminated underdrain flow in this area. Numerous underdrain cross connections and I/I related defects were identified. Several of the defects were rehabilitated under the Area B Phase I Sanitary Sewer Rehabilitation Project. The remainder will be included under the subject project.

**SUMMARY OF PROJECT COSTS**

Sewer System Evaluation Survey – Phase II Study	\$ 537,250
Area B Design of Phase IA Recommended Sewer Rehabilitations	\$ 225,000
Area B Construction of Phase IA Recommended Sewer Rehabilitations	\$ 283,750
	-----
TOTAL PROJECT COST	\$1,046,000

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-24-3-743**

**CITY OF NEWTON**

**AREA B SEWER SYSTEM EVALUATION SURVEY (SSES) – PHASE II STUDY  
AND  
AREA B DESIGN & CONSTRUCTION OF PHASE IA RECOMMENDED SEWER  
REHABILITATIONS**

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Area B SSES - Phase II Study		
Manhole Inspections, flow isolation, TV inspections	February 2012	April 2012
Review/analysis of data/ CEA & Report preparation	May 2012	December 2012
Design of Area B Phase IA Sewer Rehabilitations	August 2011	November 2011
Construction of Area B Phase IA Sewer Rehabilitations	November 2011	May 2012
Re-testing & Warranty Inspection	March 2013	April 2013

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
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**CITY OF QUINCY, MASSACHUSETTS  
PROJECT NO. WRA-P7-26-3-737  
COASTAL MANHOLE & PIPELINE I/I REDUCTION - PHASES 2A / 2B**

**SCOPE OF SERVICES**

This project is a combination of planning, design and construction, including the identification and prioritization of rehabilitating sewer manholes and pipeline in the City of Quincy that are a source of groundwater, seawater and/or stormwater I/I to the sewer system.

In 2009, the City launched a long-term plan to address I/I in the sewer system. During Summer 2009, 200+ manholes were inspected and evaluated, which led to Phase 1 rehabilitation construction in Fall 2010/Spring 2011. Phase 1 construction is nearing completion and has focused on manholes in coastal areas. Phase 2A, scheduled for Summer 2011, and Phase 2B, scheduled for 2012, will focus on repairing additional sewer manholes and pipeline in coastal areas inspected last summer in a second round of investigations. Approximately 300 manholes and over 23,500 linear feet of pipeline were inspected in six coastal areas (Black's Creek / Camden / Hough's Neck / Adams Shore / Squantum / Germantown).

Due to the large quantity of infrastructure investigated and found to require repair, Phase 2 rehabilitation construction will be divided into contracts: Phase 2A (primarily Hough's Neck) and Phase 2B (remaining coastal areas identified as high priority I/I sources). Project work will include rehabilitation construction to approximately 21,000 linear feet of sewer pipe and approximately 200 manholes. These quantities will be split into roughly equal amounts under Phase 2A and Phase 2B.

Repairs to manholes will include monolithic liner application, manhole rebuilding or patching, manhole replacement, manhole cleaning and installation of a new frames and covers.

Repairs to sewer pipeline will include cured-in-place-pipe (CIPP) lining from manhole to manhole, cleaning, inspecting, testing and sealing (CITS) of pipe joints and service connections and open cut dig and replace pipe repair.

As a result of the above work, the peak rate of I/I to be removed from the MWRA's collection system by this project is estimated at 1.47 mgd. Total project cost is estimated at \$2,371,000 (Construction = \$1,975,000 / Construction Services = \$396,000). Eligible MWRA I/I Local Financial Assistance is \$1,752,000 (Construction = \$1,752,000).

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

CITY OF QUINCY, MASSACHUSETTS  
PROJECT NO. WRA-P7-26-3-737  
COASTAL MANHOLE & PIPELINE I/I REDUCTION - PHASES 2A / 2B

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
<b>Phase 2A I/I Reduction:</b>		
Design	January 2011	July 2011
Permitting/Bid/Award	July 2011	August 2011
Construction	August 2011	June 2012
<b>Phase 2B I/I Reduction:</b>		
Design	September 2011	January 2012
Permitting/Bid/Award	March 2012	June 2012
Construction	July 2012	June 2013

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-28-3-742**

**TOWN OF READING**

**IMPLEMENTATION OF RECOMMENDATIONS PER INFILTRATION/INFLOW (I/I)  
INVESTIGATIONS REPORT OF AUGUST 2010**

**SCOPE OF SERVICES**

The purpose of this project is to continue the Infiltration/Inflow (I/I) work in accordance with the recommendations of the August 2010 Infiltration/inflow (I/I) Investigations Report completed under MWRA Project No. WRA-P7-28-3-701.

The specific I/I Identification work will consist of the following; flow isolation of approximately 8,830 linear feet of sewer in Sewer Meter Areas #2B2 & 2B3; Smoke testing of approximately 237,000 linear feet of sewer in Sewer Meter Areas #3A, 3C, 3D, 4A, 4B and 5; dye testing at an estimated 75 locations based upon the results of the smoke testing.

At the completion of the I/I identification work, a report will be prepared which will summarize the data collected and analysis thereof, present recommendations for further investigations and recommended sewer rehabilitations.

The recommended sewer rehabilitation work will consist of performing TV inspection, joint testing and sealing of the sewer in Sewer Meter Areas #1 and 4A. The sewer rehabilitation work will also include the redirection of the storm drain at 2 locations; redirection of 5 catch basins; redirection of 1 sump pump; and the repair of 10 manhole frame seals. The specific locations of these sources are noted in the subject Report.

**PROJECT COST SUMMARY**

<u>Task</u>	<u>Estimated Cost</u>
I/I Investigations & Report (flow isolation, smoke testing, dye testing)	\$ 163,700
TV Inspection, Joint Testing & Sealing	\$ 117,505
Inflow Redirection	\$ 61,500
Manhole Rehabilitations	\$ 75,000
<b>Total Estimated Cost</b>	<b><u>\$ 417,705</u></b>

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
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FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P7-28-3-742

TOWN OF READING

IMPLEMENTATION OF RECOMMENDATIONS PER INFILTRATION/INFLOW (I/I)  
INVESTIGATIONS REPORT OF AUGUST 2010

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
I/I Investigations & Report	July 2011	March 2012
Inflow Redirection & Sewer Rehabilitations	May 2011	December 2011



# MWRA I/I Local Financial Assistance Program Funding Summary

November 2011 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Braintree	\$ 625,873
Brookline	\$ 382,000
Framingham	\$ 772,605
Weymouth	\$ 636,900
	<hr/>
Total	\$ 2,417,378

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF BRAINTREE, MASSACHUSETTS  
TOWN-WIDE I/I INVESTIGATION AND REHABILITATION PROGRAM - YEAR 1  
MWRA PROJECT NO. WRA-P7-06-3-748**

**SCOPE OF SERVICES**

Year 1 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 S1 and W2.

Project work will include, but not be limited to, the following:

1. **Flow Isolation:** Flow isolation work will be undertaken in approximately 49,200 linear feet (LF) of sewer in Subareas S1 / W2 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 49,200 LF of sewer in Subareas S1 / W2. 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 S1 / W2. A written inspection log will be furnished for each manhole.
4. **Database Development:** The Town's consultant has recently developed a database to store sewer system information. Data collected through the above investigations will be added to the existing 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.
5. **Letter Report:** 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.
6. **Rehabilitation Contract Documents:** Construction plans and specifications will be developed and submitted to remove excessive I/I identified during the investigation, followed by 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 7 I/I Local Financial Assistance Project Application received November 21, 2011.

Total project cost is estimated at \$675,000. Eligible MWRA I/I Local Financial Assistance is \$625,873 (Investigation = \$145,000 / Design & Bidding = \$50,000 / Construction = \$400,000 / Construction Services = \$30,873).

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF BRAINTREE, MASSACHUSETTS  
TOWN-WIDE I/I INVESTIGATION AND REHABILITATION PROGRAM - YEAR 1  
MWRA PROJECT NO. WRA-P7-06-3-748**

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Planning / Design Phase	December 2011	December 2012
Town / MWRA Review	December 2012	January 2013
Advertise in Central Register	January 2013	January 2013
Open Bids	January 2013	February 2013
Award Contract	February 2013	March 2013
Construction	March 2013	June 2013
Retesting	March 2014	June 2014

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-07-2-746**

**TOWN OF BROOKLINE**

**INFILTRATION/INFLOW INVESTIGATION AND SEWER SYSTEM REHABILITATION  
DESIGN FOR: 1.) SEWER SUBAREAS NI-7, NI-8 & NI-12; 2.) ELIOT ST AREA;  
3.) ENGLEWOOD & KILSYTH ROAD AREA**

**SCOPE OF SERVICES**

Sewer Areas NI-7, NI-8 & NI-12 The work for these sewer areas will involve review of existing sewer records and drawings, conducting flow observation and Closed-Circuit TV inspection of the sanitary sewers in the subject areas to identify sources of Infiltration. Excessive I/I rates were identified in the Town's Wastewater Master Plan. Based on the results of the proposed investigation, a sewer system rehabilitation design will be completed. A Technical Memorandum will be prepared which will present the results of the investigations, problems identified and present recommendations for sewer rehabilitations including estimated costs.

Eliot Street Area The work for this area will involve review of existing sewer records and drawings, performing Closed-Circuit TV inspection of sewers and other various field inspection techniques to identify the cause of chronic sewer surcharging in the area during various sized storm events. In depth field observations will be performed to identify sewer segments which exhibit large amounts of clear flow. A Technical Memorandum will be prepared which will present the results of the investigations, problems identified and present recommendations for sewer rehabilitations including estimated costs.

Englewood & Kilsyth Area The work for this area will involve the review of existing reports and records review, review of existing flowmeter data and various field investigations associated with wet weather surcharging of the sanitary sewer in the area. A capacity analysis of the sewers in the area will also be performed. Various alternatives for minimizing the surcharging will be developed and evaluated. A Technical Memorandum will be prepared which will present the results of field investigations and capacity analysis during wet weather and evaluate alternatives to prevent or minimize sewer surcharging of sewers in this area during wet weather periods. A design will be completed for the selected alternative(s).

**PROJECT COST SUMMARY**

<u>Description of Task</u>	<u>Estimated Cost</u>
Infiltration/Inflow Investigations	
Project Administration & Management	\$ 16,008
Data Collection & Review	\$ 8,440
Sewer Areas NI-7, NI-8 & NI-12	\$ 86,721
Eliot Street Area	\$ 18,782
Englewood & Kilsyth Area	\$ 29,217
Design of Sewer Rehabilitations based on results of Investigations	\$ 222,832
TOTAL ESTIMATED PROJECT COST	<u>\$ 382,000</u>

**MWRA I/ LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-07-2-746**

**TOWN OF BROOKLINE**

**INFILTRATION/INFLOW INVESTIGATION AND SEWER SYSTEM REHABILITATION  
DESIGN FOR: 1.) SEWER SUBAREAS NI-7, NI-8 & NI-12; 2.) ELIOT ST AREA;  
3.) ENGLEWOOD & KILSYTH ROAD AREA**

**PROJECT SCHEDULE**

<u>General Description of Work Performed</u>	<u>Start Date</u>	<u>Completion Date</u>
Sewer Subareas NI-7, NI-8 & NI-12		
Review of existing data (TV tapes)	October 2011	October 2011
Flow Observation/Investigation	October 2011	December 2011
TV Inspection	December 2011	January 2012
Technical Memorandum Preparation	February 2012	March 2012
Sewer Rehabilitation Design	March 2012	June 2012
 Eliot St Area		
Flow Observation/ Surcharge Investigation	October 2011	November 2011
TV Inspection	November 2011	December 2011
Technical Memorandum Preparation	December 2011	January 2012
Sewer Rehabilitation Design	January 2012	March 2012
 Englewood & Kilsyth Area		
Investigations & Alternatives Evaluation	October 2011	November 2011
Design of Recommended Alternative	November 2011	June 2011

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
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FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF FRAMINGHAM, MASSACHUSETTS CONTRACT NO. PW 191  
(MWRA PROJECT NO. WRA-P7-14-3-745)  
COBURN STREET AREA SEWER MAIN REHABILITATION**

**SCOPE OF SERVICES**

The proposed project includes contracted sewer rehabilitation/replacement in various areas surrounding Coburn Street in the Town of Framingham. A complete internal TV inspection of all gravity sewers in the area was performed November/December 2010. Much of the existing infrastructure has been in service well beyond its expected design life and has required above average maintenance attention. The proposed sewer rehabilitation will significantly reduce I/I in the Coburn Street area.

Work to be performed under this project includes, but is not necessarily limited to replacement of approximately 5900 linear feet (LF) of 8 to 10-inch sewer main; replacement of approximately 1850 LF of sewer services; cured-in-place lining of approximately 1250 LF of sewer main; replacement of approximately 300 vertical feet (VF) of sewer manholes; rehabilitation of 14 existing manholes; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications of Framingham Contract No. PW 191 (Replacement, Upgrade and Rehabilitation of Water and Sewer Mains in the Coburn Street Area) and the approved MWRA Phase 7 I/I Local Financial Assistance Project Application received August 8, 2011.

The project's work area includes Winthrop Street from Waverly Street to Wood Avenue, Wood Avenue, Cypress Street, Mellen Street and all smaller streets west of Mellen Street bounded by Waverly Street, Winthrop Street and Mellen Street.

Peak I/I reduction is estimated to be 0.14 mgd. Total project construction cost is estimated at \$2,031,700 (Base Bid). Eligible MWRA I/I Local Financial Assistance is \$772,605 (Sewer Rehabilitation-Related Construction = \$772,605).

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF FRAMINGHAM, MASSACHUSETTS CONTRACT NO. PW 191  
(MWRA PROJECT NO. WRA-P7-14-3-745)  
COBURN STREET AREA SEWER MAIN REHABILITATION**

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	June 2010	March 2011
Bid/Award	March 2011	July 2011
Construction	August 2011	September 2012

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
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**TOWN OF WEYMOUTH, MASSACHUSETTS  
HINSTON ROAD / NECK STREET SEWER REHABILITATION - CONSTRUCTION**

**MWRA PROJECT NO. WRA-P7-39-3-749**

**SCOPE OF SERVICES**

The proposed project includes contracted sewer rehabilitation/replacement within the Hinston Road / Neck Street area of the Town of Weymouth. Following sewer main failures in the area during March 2010 and January 2011, internal TV sewer inspection and zoom camera sewer inspection of sewer mains were performed and the resultant data evaluated.

Based upon the findings above, recommended work to be performed under this project includes, but is not necessarily limited to cleaning and TV inspection of approximately 10,000 LF of sewer; cured-in-place structural lining of approximately 2030 LF of 15-inch sewer; cured-in-place structural lining of approximately 1187 LF of 18-inch sewer; cured-in-place structural lining of approximately 370 LF of 24-inch sewer; cementitious lining of approximately 105 vertical feet (VF) of sewer manholes; emergency point repairs; and the performance of all other work pursuant to the terms and conditions detailed within and the approved MWRA Phase 7 I/I Local Financial Assistance Project Application received November 2, 2011.

Peak I/I reduction is estimated to be 0.04 mgd. Total project construction cost is estimated at \$636,900. Eligible MWRA I/I Local Financial Assistance is \$636,900 (Sewer Rehabilitation Construction = \$586,900 / Construction Services = \$50,000).



MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

TOWN OF WEYMOUTH, MASSACHUSETTS  
HINSTON ROAD / NECK STREET SEWER REHABILITATION - CONSTRUCTION

MWRA PROJECT NO. WRA-P7-39-3-749

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design Phase	December 2011	January 2012
Bidding Phase	February 2012	April 2012
Construction	June 2012	September 2012

# MWRA I/I Local Financial Assistance Program Funding Summary

February 2012 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Needham	\$ 401,800
Stoughton	\$ 60,500
Westwood	\$ 386,000
Total	\$ 848,300

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF NEEDHAM, MASSACHUSETTS  
PHASE III I/I REHABILITATION CONSTRUCTION  
(SUBAREAS 16 / 22 AND OTHERS)**

**MWRA PROJECT NO. WRA-P7-23-3-751  
NEEDHAM CONTRACT NO. FY 12-14-01**

**SCOPE OF SERVICES**

The purposed project is the third phase of contracted construction leading to the elimination of I/I sources within Sewer Subareas 16 / 22 and Others in the Town of Needham. In Spring 2008, manhole inspections and internal closed circuit television inspections were conducted within Sewer Subareas 16 and Lower 22. Project design detailed the method of I/I removal via plans/specifications suitable for bidding, as outlined in the 'Sewer Infiltration Investigation for Subareas 16 and Lower 22 Report' (dated January 2009).

I/I Rehabilitation Construction work includes, but is not limited to, the following sewer main/manhole rehabilitation measures:

1. Chemical root treatment of 650 linear feet (LF) of gravity sewer;
2. Clean and TV inspection of 14,500 LF of sewer main;
3. Clean, test and seal 800 LF of 8 and 10-inch gravity sewer;
4. Renew three (3) sewer service laterals;
5. Seal thirty-five (35) wyes;
6. Point repair twenty (20) sections of 8 and 18-inch gravity sewer;
7. Remove and replace seven (7) 20 foot sections of 6 and 8-inch gravity sewer;
8. Install two thousand, two hundred (2200) LF of 8-inch CIP liner;
9. Clean, seal and coat the fifty (50) vertical feet of sewer manholes; and
10. Remove and replace fourteen (14) sewer manholes.

Total project cost is estimated at \$409,800. Eligible MWRA I/I Local Financial Assistance is \$401,800 (Construction / Police Details = \$401,800). As a result of the above work, 0.04 mgd of peak I/I will be removed from the collection system upon contract completion.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF NEEDHAM, MASSACHUSETTS  
PHASE III I/I REHABILITATION CONSTRUCTION  
(SUBAREAS 16 / 22 AND OTHERS)**

**MWRA PROJECT NO. WRA-P7-23-3-751  
NEEDHAM CONTRACT NO. FY 12-14-01**

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	November 2011	December 2011
Bidding	January 2012	February 2012
Construction	March 2012	June 2012

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF STOUGHTON SEWER INVESTIGATION & REHABILITATION  
YEAR 7 I/I EVALUATION**

**MWRA PROJECT NO. WRA-P7-32-1-750**

**SCOPE OF SERVICES**

The purpose of this project is to identify and rehabilitate community subareas that contribute excessive I/I, evaluate rehabilitation options and rehabilitate the sewer system on a continuous set schedule. The project area includes Stoughton Subareas 1 and 13. Project work will include, but not be limited to, the following:

1. **Year 7 I/I Evaluation – TV Inspection:** Review TV inspection videos of approximately 38,000 linear feet (LF) of sewer in Subareas 1 and 13, as delineated on the existing draft sanitary sewer GIS map (updated August 2009), to locate problem areas and I/I sources within manhole-to-manhole segments of sewer; develop TV inspection logs and use the data to detail rehabilitation recommendations and a cost-effectiveness analysis;
2. **Year 7 I/I Evaluation – Physical Survey of Manholes:** Perform topside physical survey of as many as 410 sewer manholes in Subareas 1 and 13, as delineated on the existing draft sanitary sewer GIS map (updated August 2009), for defects and I/I sources; A written log and photo will be furnished for each manhole inspected. The manhole survey will document location, structural defects, I/I sources, size, depth, materials of construction, solids deposition and other pertinent information. When manholes are observed to be depressed or can otherwise collect runoff, an estimate of manhole's drainage area will be provided.
3. **Year 7 I/I Evaluation – Letter Report:** Prepare a letter report that details areas in which work was performed, summarizes work completed to date and include recommendations, a cost-effectiveness analysis and prioritization analysis for rehabilitation of pipeline/manhole defects and I/I sources identified during this investigation. Estimated construction costs will also be provided. For those I/I sources that will require additional investigative work, the report will include a plan and a cost estimate to conduct the investigation.

The above work will be performed pursuant to the terms and conditions detailed within the Agreements For Engineering Services By and Between the Town of Stoughton and Weston & Sampson Engineers, Inc. (dated June 29, 2011) and the approved MWRA Phase 7 I/I Local Financial Assistance Project Application received December 20, 2011.

Total project cost is estimated at \$73,000. Eligible MWRA I/I Local Financial Assistance is \$65,000 (MWRA Phase 7 Award Amount = \$60,500 / Expendable MMDT Account Interest = \$4,500).

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF STOUGHTON SEWER INVESTIGATION & REHABILITATION  
YEAR 7 I/I EVALUATION**

**MWRA PROJECT NO. WRA-P7-32-1-750**

**PROJECT SCHEDULE**

**Year 7 I/I Evaluation:**

Manhole Inspections	Summer 2011
TV Inspection Review	Summer / Fall 2011
Engineering Review / Reporting	Winter 2012

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WESTWOOD, MASSACHUSETTS  
SEWER SYSTEM REHABILITATION CONSTRUCTION**

**MWRA PROJECT NO. WRA-P7-38-3-753**

**SCOPE OF SERVICES**

The proposed project is contracted construction leading to the elimination of I/I sources within Westwood sewer subareas. Project design detailed the method of I/I removal via plans / specifications suitable for bidding, as outlined in the 'Wastewater Flow Analysis / Metering Data Review Report' (dated January 2009) and the on-going I/I Study / Report.

I/I Rehabilitation Construction work includes, but is not limited to, the following sewer main / manhole rehabilitation measures:

1. Furnish and install cured-in-place (CIP) lining of 7600 linear feet (LF) of existing 8-inch sewers including cleaning and television inspection;
2. Furnish and install CIP lining of 3000 LF of existing 12-inch sewers including cleaning and television inspection;
3. Furnish and install 180 vertical feet of cementitious interior manhole lining at 16 locations; and
4. Grout 136 service laterals/mainline connections.

Additive Infiltration Rehabilitation Construction work may include the following sewer main / manhole rehabilitation measures:

1. Furnish and install CIP lining of 6591 LF of existing 8-inch sewers including cleaning and television inspection;
2. Furnish and install CIP lining of 523 LF of existing 12-inch sewers including cleaning and television inspection;
3. Furnish and install 240 vertical feet of cementitious interior manhole lining; and
4. Grout 111 service laterals/mainline connections.

Total project cost is estimated at \$532,900. Eligible MWRA I/I Local Financial Assistance is \$386,000 (Construction = \$386,000). As a result of the above work, 0.24 mgd of peak I/I will be removed from the collection system upon contract completion.

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

TOWN OF WESTWOOD, MASSACHUSETTS  
SEWER SYSTEM REHABILITATION CONSTRUCTION

MWRA PROJECT NO. WRA-P7-38-3-753

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Bidding	February 2012	March 2012
Construction	May 2012	August 2012



# MWRA I/I Local Financial Assistance Program Funding Summary

May 2012 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Belmont	\$ 1,017,101
Holbrook	\$ 399,962
Natick	\$ 357,900
Somerville	\$ 2,939,000
Wakefield	\$ 546,900
Walpole	\$ 169,300
Watertown	\$ 540,000
Wellesley	\$ 261,261
Winchester	\$ 117,300
Winthrop	\$ 661,600
Total	\$ 7,010,324

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-04-3-756**

**TOWN OF BELMONT**

**TOWN-WIDE SEWER SERVICE LATERALS AND MAINLINE SEWER  
REHABILITATION PROJECT**

**SCOPE OF SERVICES**

The main objective of this project is the identification and removal of sources of Infiltration in the sewer service laterals. Over the past years, the Town has conducted an extensive program of cured-in-place lining of the mainline sewer. In the subsequent post-lining video inspection, clear flow has been observed from the sewer service laterals. Under the preliminary design phase, approximately 60,000 linear feet of post-lining video will be reviewed to identify sewer service laterals that exhibit clear flow (aka Infiltration). These laterals will then be categorized by corresponding flow metering area and ranked by quantity of Infiltration.

A secondary objective of this project is the cleaning and internal TV inspection of approximately 5,500 linear feet of mainline sewer recommended by the SSES Final Report (October 2009).

A Preliminary Design Report will be prepared which will summarize the following: the sewer laterals and sewer segments where Infiltration was observed; the estimated amount of observed Infiltration; the recommended rehabilitation method and opinion of probable construction cost.

This project will also include the design and construction of the recommended sewer rehabilitations to eliminate the sources of Infiltration that were found. The intent is to rehabilitate the laterals and sewer to eliminate as many of the sources found as funds will allow starting with the highest ranked sources. It is expected that the major rehabilitation method to be utilized will be the trenchless cured-in-place lining of both the mainline sewer and sewer service laterals.

**ESTIMATED PROJECT COST SUMMARY**

<u>DESCRIPTION OF WORK</u>	<u>ESTIMATED COST</u>
Preliminary Design	\$ 38,000
Final Design & Engineering Services During Construction	\$ 100,000
Rehabilitation of Recommended Laterals & Mainline Sewers	\$ 879,101
<b>TOTAL ESTIMATED COST</b>	<b><u>\$ 1,017,101</u></b>

MWRA /I/ LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P7-04-3-756

TOWN OF BELMONT

TOWN-WIDE SEWER SERVICE LATERALS AND MAINLINE SEWER  
REHABILITATION PROJECT

PROJECT SCHEDULE

<u>General Description of Work Performed</u>	<u>Start Date</u>	<u>Completion Date</u>
Preliminary Design	January 2012	May 2012
Final Design of Recommended Rehabilitations	May 2012	July 2012
Construction of Recommended Rehabilitations	July 2012	July 2013

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF HOLBROOK, MASSACHUSETTS  
WASTEWATER SYSTEM IMPROVEMENTS**

**HOLBROOK CONTRACT 1: SEWER SYSTEM REHABILITATION**

**MWRA PROJECT NO. WRA-P7-16-3-762**

**SCOPE OF SERVICES**

The proposed project is contracted construction leading to the elimination of I/I sources within Holbrook sewer subareas. Rehabilitation Construction work includes, but is not limited to, the following sewer main / manhole rehabilitation measures:

1. Furnish and install 40 vertical feet (VF) of cementitious interior manhole lining at 2 locations;
2. Furnish and install 14 sewer manhole frames and covers; reset 6 existing sewer manhole frames and covers;
3. Furnish and install 100 linear feet (LF) of cured-in-place (CIP) lining in existing 8 to 36-inch sewers;
4. Furnish and install 20 CIP spot repairs in existing 8 to 36-inch sewers;
5. Perform 5300 LF of chemical root removal in existing 8 to 36-inch sewers;
6. Test 2800 sewer joints in existing 8 to 36-inch sewers;
7. Seal and retest 1400 sewer joints in existing 8 to 36-inch sewers; and
8. Seal and test 150 existing sewer service connections (including TV inspection).

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 Holbrook and Camp Dresser & McKee, Inc. (dated March 29, 2005 and Amendment No. 3 dated July 25, 2006) and the approved MWRA Phase 7 I/I Local Financial Assistance Project Application received May 1, 2012.

Total project cost is estimated at \$399,962. Eligible MWRA I/I Local Financial Assistance is \$399,962 (General Services = \$22,441 / Rehabilitation Construction = \$301,807 / Resident Engineering Services = \$75,714). As a result of the above work, an estimated 0.06 mgd of peak infiltration will be removed from the collection system upon contract completion.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF HOLBROOK, MASSACHUSETTS  
WASTEWATER SYSTEM IMPROVEMENTS**

**HOLBROOK CONTRACT 1: SEWER SYSTEM REHABILITATION**

**MWRA PROJECT NO. WRA-P7-16-3-762**

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction	August 2007	March 2008

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF NATICK, MASSACHUSETTS**

**SEWER SYSTEM INFILTRATION REHABILITATION  
(SEWER SUBSYSTEMS 10 / 12 / 15 / 19 / 20)**

**MWRA PROJECT NO. WRA-P7-22-3-761**

**SCOPE OF SERVICES**

The proposed project is a continuation of a multi-year sewer rehabilitation plan focusing on infiltration removal within the Town's sanitary sewer system.

Project work (as identified in the recently completed Sewer System Evaluation Survey) will include, but not be limited to, the following:

1. CIPP lining of approximately 7300 linear feet of 8 and 10-inch sewers in Sewer Subsystems 10 / 12 / 15 / 19 / 20.

The project area includes the following streets: Edgewood Avenue ROW / Hardwick Road / Mercer Road ROW / Pilgrim Road (ROW to Ranger Road) / Plain Street / Sawin Street / Travis Road ROW / Virginia Road.

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 Natick and Haley and Ward, Inc. and the approved MWRA Phase 7 I/I Local Financial Assistance Project Application received April 27, 2012.

Total project cost is estimated at \$357,900. Eligible MWRA I/I Local Financial Assistance is \$357,900 (Design = \$11,700 / Bid and Construction Administration = \$19,200 / Rehabilitation Construction = \$327,000). As a result of the above work, an estimated 0.06 mgd of peak infiltration will be removed from the collection system upon contract completion.

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

TOWN OF NATICK, MASSACHUSETTS

SEWER SYSTEM INFILTRATION REHABILITATION  
(SEWER SUBSYSTEMS 10 / 12 / 15 / 19 / 20)

MWRA PROJECT NO. WRA-P7-22-3-761

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	May 2012	June 2012
Bidding / Award	July 2012	August 2012
Construction	September 2012	December 2012

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-30-3-754**

**CITY OF SOMERVILLE**

**MIDDLESEX AVENUE SEWER LINE RECONSTRUCTION PROJECT  
(FEBRUARY 2012)**

**SCOPE OF SERVICES**

Recent internal TV inspection of the sewer on along McGrath Highway Extension and Middlesex Avenue indicated that the sewer is significantly deteriorated with sections that were collapsed or partially collapsed. To compound the problem, in a portion of the project area, the existing storm drainage area is located directly over the sewer pipe. This situation not only allows storm water to flow from the storm drainage system into the sewer system at the locations of severely open joints or collapsed pipe but also does not allow the replacement of the sewer without disturbing the storm drain. Also, due to the location of other utilities in the area, the replacement of the sewer and storm drain in the same trench would be extremely difficult and costly. Therefore, to eliminate these sources of Inflow, approximately 500 lf. of sewer and storm drain will be relocated. The existing sewer and storm drain system will be abandoned.

Approximately 600 linear feet of sewer on McGrath Highway Extension does not need to be replaced but will receive a cured-in-place liner.

This construction project will also include engineering services during the bid and award process and during the construction.

Since this sewer rehabilitation and replacement project is located on a busy thoroughfare, a significant amount of Police Details will also be required.

**PROJECT COST SUMMARY**

<u>Project Task</u>	<u>Estimated Cost</u>
Middlesex Avenue Sewer Line Reconstruction Project	
Bid & Award, Engineering Services During Construction	\$ 37,240
Construction	\$ 426,440
Police Details	\$ 18,320
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<b>TOTAL ESTIMATED PROJECT COST</b>	<b><u>\$ 482,000</u></b>



MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P7-30-3-754

CITY OF SOMERVILLE

MIDDLESEX AVENUE SEWER LINE RECONSTRUCTION PROJECT  
(FEBRUARY 2012)

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Bid & Award	May 2012	July 2012
Construction	July 2012	December 2012

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-30-3-760**

**CITY OF SOMERVILLE**

**EAST BROADWAY SEWER REHABILITATION AND REPLACEMENT PROJECT**

**SCOPE OF SERVICES**

The East Broadway Sewer Rehabilitation and Replacement is a part of the overall reconstruction project of East Broadway from the Boston City line to the intersection with McGrath Highway. This project is a Massachusetts Highway Department project which is receiving Federal Aid (Project #HP-002S (344) X). The sewer rehabilitation is being performed as part of this project to enhance the overall reconstruction. The sewer rehabilitation work is not eligible for Federal or State aid. The specific sewer rehabilitation work consists of: the cured-in place pipe lining of approximately 6,250 linear feet (lf) of 8" to 24" diameter vitrified clay sewer; cured-in-place pipe lining of approximately 600 lf of 36" diameter brick sewer; replacement of approximately 1,350 lf of 10" to 20" diameter vitrified clay pipe with PVC pipe; lining of approximately 450 vertical feet of sewer manholes; replacement of approximately 4 sewer manholes and all appurtenances.

This construction project will also include engineering services during the sewer and manhole rehabilitation and replacement.

Since this sewer rehabilitation and replacement project is located on a busy thoroughfare, a significant amount of Police Details will also be required.

**ESTIMATED PROJECT COST SUMMARY**

<u>Project Task</u>	<u>Estimated Cost</u>
East Broadway Sewer Rehabilitation and Replacement Project	
Engineering Services During Construction	\$ 193,400
Construction Phase	\$ 1,934,000
Construction Contingency (10%)	\$ 193,400
Police Details	\$ 136,200
<b>TOTAL ESTIMATED PROJECT COST</b>	<b><u>\$ 2,457,000</u></b>

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P7-30-3-760

CITY OF SOMERVILLE

EAST BROADWAY SEWER REHABILITATION AND REPLACEMENT PROJECT

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction	June 2012	December 2013

MWRA III LOCAL FINANCIAL ASSISTANCE PROGRAM – PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P7-33-3-755

TOWN OF WAKEFIELD

**SEWER SUBAREA 3 ADDITIONAL CLEANING & INTERNAL TV INSPECTION OF SEWER;  
SEWER SUBAREAS 3 & 6 DESIGN, BID & AWARD AND CONSTRUCTION OF RECOMMENDED  
SEWER AND MANHOLE REHABILITATIONS**

**SCOPE OF SERVICES**

Sewer Subarea 3 Additional Cleaning & Internal TV Inspection of Sewer Under this project, the cleaning and internal inspection of approximately 7,000 linear feet (lf) of sewer will be performed. The internal TV Inspection of these particular sewer segments could not be completed due to observed blockages and debris during the internal inspections that were performed in the Spring 2011 in Subarea 3. The specific sewer segments and their location are listed in Table 11 of the “Sanitary Sewer Investigation Assistance – Subarea 3 TV Inspection of Sewers and Manhole Investigations in Subarea 3 and Subarea 6 Low-Lying Areas” Report dated December 2011. A brief Technical Memorandum will be prepared which summarizes the results of the internal TV inspections and presents rehabilitation recommendations along with cost estimates.

Sewer Subareas 3 & 6 Design, Bid & Award and Construction of Recommended Sewer and Manhole Rehabilitations This project involves the design and construction phases of the sewer and manhole rehabilitations recommended for Sewer Subareas 3 & 6. The particular rehabilitations are those recommended in the two Reports entitled “Sanitary Sewer Investigation Assistance – Subarea 3 TV Inspection of Sewers and Manhole Investigations in Subarea 3 and Subarea 6 Low-Lying Areas” dated December 2011 and “Sanitary Sewer Investigation Assistance – Subarea 3 Smoke Testing, Dye Testing and Dye Flooding Program” Report dated November 2011. The specific rehabilitations will include but not be limited to the following approximate quantities: 14,339 lf of clean, inspect test & seal of sewer; 3,398 lf of root treatment of sewer; installation of short liners and structural short liners at 57 locations; 5,670 lf of cured-in-place pipe and structural cured-in-place pipe; cutting of 23 protruding service connections; grouting of 38 sewer service connections; rehabilitation of 72 manholes; installation of 6 manhole Inflow dishes and all associated appurtenances.

**ESTIMATED PROJECT COST SUMMARY**

<u>Description of Task</u>	<u>Estimated Cost</u>
Subarea 3 Cleaning & Internal TV Inspection of Sewer	\$ 42,000
Design, Bid & Award of Sewer & Manhole Rehabilitations	\$ 50,000
Construction of Cedar Street Repairs in Subarea 3	\$ 24,000
Construction of Sewer & Manhole Rehabilitations	\$ 349,900
Engineering Services During Construction of Rehabilitation	\$ 81,000
<b>TOTAL ESTIMATED PROJECT COST</b>	<b><u>\$ 546,900</u></b>

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-33-2-755**

**TOWN OF WAKEFIELD**

**SEWER SUBAREA 3 ADDITIONAL CLEANING & INTERNAL TV INSPECTION OF SEWER;  
SEWER SUBAREAS 3 & 6 DESIGN, BID & AWARD AND CONSTRUCTION OF  
RECOMMENDED SEWER AND MANHOLE REHABILITATIONS**

**PROJECT SCHEDULE**

<u>General Description of Work Performed</u>	<u>Start Date</u>	<u>Completion Date</u>
Cedar Street Sewer Repairs (Subarea 3)	May 2012	June 2012
Subarea 3 Additional Cleaning & Internal Inspection of Sewer	May 2012	June 2012
Subarea 3 & 6 Sewer and Manhole Rehabilitations		
Design	May 2012	August 2012
Bid & Award	August 2012	October 2012
Construction	October 2012	December 2012
Warranty and Retesting	March 2013	May 2013

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WALPOLE, MASSACHUSETTS  
YEAR 6 I/I INVESTIGATION AND EVALUATION  
MWRA PROJECT NO. WRA-P7-34-3-759**

**SCOPE OF SERVICES**

The purpose of this project is to identify and rehabilitate community subareas that contribute excessive I/I, evaluate rehabilitation options and rehabilitate the sewer system on a continuous set schedule. Project work will be undertaken in Walpole Subareas 3 and 12. These subareas include approximately 63,100 linear feet (LF) of sewer and approximately 315 sewer manholes. Project work will include, but not be limited to, the following:

- 1. Year 6 I/I Investigation – Flow Isolation / TV Inspection:** Flow isolate as many as 63,100 LF of sewer in Subareas 3 and 12 to quantify the amount of infiltration within manhole-to-manhole segments of sewer. The inspection will be conducted in Spring 2012 between the hours of 12AM and 6AM when groundwater levels are typically at their highest and sanitary flows are at a minimum. Clean, TV inspect, videotape and record as many as 63,100 LF of sewer in Subareas 3 and 12 to locate problem areas and I/I sources within manhole-to-manhole segments of sewer. The inspection will be conducted in Spring 2012 when groundwater levels are typically at their highest.
- 2. Year 6 I/I Investigation – Physical Survey of Manholes:** Conduct topside physical survey of as many as 315 sewer manholes in Subareas 3 and 12 for defects and I/I sources. A written log will be furnished for each manhole inspected. The manhole survey will document location, structural defects, I/I sources, size, depth, materials of construction, solids deposition and other pertinent information. When manholes are observed to be depressed or can otherwise collect runoff, an estimate of manhole's drainage area will be provided.
- 3. Year 6 I/I Evaluation – Cost Effective Analysis / Letter Report:** Prepare a letter report that details areas in which work was performed, summarizes work completed to date and include recommendations, a cost-effectiveness analysis and prioritization analysis for rehabilitation of pipeline/manhole defects and I/I sources identified during this investigation. Estimated construction costs will also be provided. For those I/I sources that will require additional investigative work, the report will include a plan and a cost estimate to conduct the investigation.

Total project cost is estimated at \$178,000. Eligible MWRA I/I Local Financial Assistance is \$178,000 (MWRA Phase 7 Award Amount = \$169,300 / Expendable MMDT Account Interest = \$8,700).

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT

TOWN OF WALPOLE, MASSACHUSETTS  
YEAR 6 I/I INVESTIGATION AND EVALUATION  
MWRA PROJECT NO. WRA-P7-34-3-759

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Year 6 Investigation	April 2012	May 2012
Year 6 Cost Effective Analysis/ Letter Report	June 2012	November 2012

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-36-3-757**

**TOWN OF WATERTOWN**

**CONSTRUCTION OF HOVEY STREET SEWER REPLACEMENT**

**SCOPE OF SERVICES**

The June 2011 Internal TV inspection of the sewer in Hovey Street following a repair by the Town for a partially collapsed pipe indicated that this sewer to be in a very deteriorated state. Additional areas of broken or collapsed pipe prevented complete inspection. Manholes were also found to be in a deteriorated state.

The recommended sewer construction includes the replacement of approximately 1,342 linear feet of 10-inch diameter sewer, 4 manholes and 30 sewer services and all associated appurtenances. Approximately 950 linear feet of sewer is 15 to 20 feet deep with the remainder being 8 to 15 feet deep. To complicate the situation, a 12-inch diameter storm drain parallels the existing sewer. Depending upon its proximity to the sewer, depth of sewer and condition of the storm drain, a portion of the storm drain may also need to be replaced.

This funding distribution will also include engineering services provided during the construction phase including bid & award, field and office services.

**PROJECT COST SUMMARY**

<u>DESCRIPTION OF WORK</u>	<u>TOTAL COST</u>
Construction of Hovey Street Sewer Replacement	\$ 435,000
Engineering Services During Construction	\$ 105,000
<b>Estimated Project Cost</b>	<b><u>\$ 540,000</u></b>



MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P7-36-3-757

TOWN OF WATERTOWN

CONSTRUCTION OF HOVEY STREET SEWER REPLACEMENT

PROJECT SCHEDULE

<u>Task Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Bid & Award	May 2012	July 2012
Sewer Replacement Construction	July 2012	June 2013

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WELLESLEY, MASSACHUSETTS  
FULLER BROOK AREA SEWER INSPECTION / REHABILITATION – YEAR 3**

**MWRA PROJECT NO. WRA-P7-37-3-758  
TOWN OF WELLESLEY CONTRACT NO. 90C-460-1366**

**SCOPE OF SERVICES**

Objectives of this sewer inspection / rehabilitation project include: (1) determination of the structural condition of sewer pipe by cleaning and internal television inspection; (2) testing VC sewer pipe joints in the project area and sealing all joints (with acrylamide sealant) not meeting specific test criteria; (3) inspecting manholes and sealing all leaks within the manholes; (4) sealing sewer connections which show signs of I/I; and (5) smoking testing specific project areas to identify direct/indirect storm water sources tributary to the sanitary sewer system. This sewer inspection / rehabilitation project has been contracted on an annual basis for the past three years.

The project area is based around the vicinity of Fuller Brook, which is located in the southwest corner of the Town. Year 3 Sewer Inspection / Rehabilitation work included cleaning and TV inspection of 53,950 linear feet (LF) of sewer; chemical root treatment of 4890 LF of sewer; testing 5750 joints and sealing/retesting 1560 joints; sealing 405 vertical feet (VF) of manholes; sealing and retesting 6 service connections; performing 4 CIPP spot repairs; and smoke testing 3750 LF of sewer.

The above Year 3 work was performed pursuant to the terms and conditions detailed within The Agreement For Professional Services By and Between the Town of Wellesley, MA and National Water Main Cleaning Company (Contract No. 09C-460-1366) dated July 10, 2011 and the approved MWRA I/I Local Financial Assistance Project Application received April 23, 2012.

Year 3 project cost is estimated at \$301,800. Eligible MWRA I/I Local Financial Assistance is \$261,261. At Year 3 project completion, an estimated 0.08 mgd of peak I/I will be removed from the community collection system.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WELLESLEY, MASSACHUSETTS  
FULLER BROOK AREA SEWER INSPECTION / REHABILITATION – YEAR 3**

**MWRA PROJECT NO. WRA-P7-37-3-758  
TOWN OF WELLESLEY CONTRACT NO. 90C-460-1366**

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Year 3 Inspection/Rehabilitation	August 2011	August 2012

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-41-1-763**

**TOWN OF WINCHESTER**

**SQUIRE ROAD & METER #4 AREA SANITARY SEWER  
EVALUATION SURVEY (SSES) STUDY**

**SCOPE OF SERVICES**

This Study will identify sources of Infiltration and Inflow (I/I) in the Squire Road and Meter #4 tributary areas.

The expected field work associated with this project will include ,but not be limited to: conducting top side physical survey of approximately 460 sewer manholes for sources of I/I; conducting flow isolation of approximately 69,000 l.f. of sewer; cleaning and internal TV inspection of approximately 69,000 l.f. of sewer; updating of sewer mapping/GIS database; preparing a draft and final report on the results of the field work which will include data analysis, cost-effectiveness analysis and recommendations for sewer rehabilitation along with preliminary design concepts.

**PROJECT COST SUMMARY**

<u>Description of Task</u>	<u>Estimated Cost</u>
Squire Road & Meter #4 Area SSES	\$ 280,000

MWRA I/ LOCAL FINANCIAL ASSISTANCE PROGRAM – PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P7-41-1-763

TOWN OF WINCHESTER

SQUIRE ROAD & METER #4 AREA SANITARY SEWER  
EVALUATION SURVEY (SSES) STUDY

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Manhole Inspections	April 2012	May 2012
Flow Isolation	April 2012	May 2012
Cleaning & TV Inspection	April 2012	May 2012
Review & Analysis of Data	June 2012	November 2012
Cost Effectiveness &/Preliminary Design	June 2012	November 2012
Final Report Submittal		December 2012

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-42-3-747**

**TOWN OF WINTHROP**

**SEWER TV INVESTIGATION, DESIGN & CONSTRUCTION OF SEWER  
REHABILITATION/REPAIR IN THE SOMERSET AVENUE, BELLEVUE AVENUE,  
ELEANOR COURT & NAHANT STREET AREAS**

**SCOPE OF SERVICES**

As part of the recently bid "Chapter 90 Roadway Improvement Project" (August 2011), the Town will be making rehabilitation/repairs to the sewer in Somerset Avenue based upon prior TV inspection. This work, which includes open-cut spot repairs of the sewer and sewer services at 6 locations on Somerset Avenue and catch basin improvement on Nahant Street to eliminate flooding/ponding over the sewer manholes, is not eligible under Chapter 90 funding but is eligible under the MWRA I/I Local Financial assistance program. The specific bid items included are #141.11 - Tests Pits, #234.06 - 6-inch PVC Sewer Pipe, #234.08 - 8-inch PVC Sewer Pipe & #234.12 - 12-inch PVC Drain Pipe.

Since the Chapter 90 Project also includes roadway improvements in Bellevue Avenue, Nahant Street & Eleanor Court along with Somerset Avenue, the Town intends to perform a Closed Circuit TV inspection of the sewer in these areas, particularly Bellevue Avenue and Somerset Avenue. Based upon this TV inspection, the Town intends to add any recommended sewer rehabilitation/repair work to the existing Chapter 90 Contract, most likely by Change Order. The estimated cost of this additional sewer rehabilitation/repair is \$77,600.

Please note that the water main replacement under this Chapter 90 Contract will be funded under the MWRA Local Pipeline Assistance Program.

**SUMMARY OF PROJECT COST**

<u>Description of Task</u>	<u>Total Cost</u>
Closed Circuit TV Inspection	\$ 5,000
Design of Sewer Rehabilitations	\$ 350
Construction Services/Inspection	\$ 200
Construction of Sewer Rehabilitations	\$ 93,600
Force Account (including Police)	\$ 3,350
<b>TOTAL PROJECT COST</b>	<b><u>\$ 102,500</u></b>

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-42-3-747**

**TOWN OF WINTHROP**

**SEWER TV INVESTIGATION, DESIGN & CONSTRUCTION OF SEWER  
REHABILITATION/REPAIR IN THE SOMERSET AVENUE, BELLEVUE AVENUE,  
ELEANOR COURT & NAHANT STREET AREAS**

**PROJECT SCHEDULE**

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
TV Inspection of Sewer	September 2011	October 2011
Design of Additional Sewer Rehabilitation	November 2011	November 2011
Construction of Sewer Rehabilitations	September 2011	September 2012

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT A  
FINANCIAL ASSISTANCE AGREEMENT**

**PROJECT NO. WRA-P7-42-3-752**

**TOWN OF WINTHROP**

**DESIGN & CONSTRUCTION OF SEWER REPLACEMENT IN WALDEN ST, WALDEN  
PLACE, SHORT ST, READ ST & LINCOLN ST FROM WALDEN TO READ ST  
AND  
TV INSPECTION OF SEWERS ON SUMMIT AVE., LOCUST ST, GROVERS AVE.,  
GOVERNOR'S DRIVE & READ ST.**

**SCOPE OF SERVICES**

As part of the recently bid of "Contract #3 – Sewer, Water & Drain Improvements (April 2012)" which is also a Chapter 90 Roadway Improvement Project, the Town will be replacing the existing sewer in Walden Street, Walden Place, Short Street, Lincoln Street from Walden Street to Read Street and Read Street from Jerald Street to Lincoln Street. This work, which includes the replacement of approximately 2,300 linear feet of 8-inch and 12-inch diameter sewer, 13 manholes and associated appurtenances, is not eligible under Chapter 90 funding but is eligible under the MWRA I/I Local Financial Assistance Program.

In 2007, as part of the Sewer System Evaluation Survey (SSES) Study, the sewers in the streets listed above were internally TV inspected. Numerous offset joints, voids, holes and lateral and circumferential cracks in the sewer were found. Sections of the sewer in Walden St were also found to be severely offset to the degree that a video camera was unable to completely inspect. These sewers were recommended for replacement

Also, under this funding distribution, the Town intends to clean & internally TV inspect approximately 3,800 linear feet of 8-inch diameter sewer in Summit Avenue, Locust Street, Grovers Avenue, Governor's Drive and Read Street to determine the condition of the sewer prior to roadway resurfacing.

Since this sewer replacement project is located on busy thoroughfares, a significant amount of Police Details will also be required.

**SUMMARY OF ESTIMATED PROJECT COST**

<u>Description of Task</u>	<u>Total Cost</u>	<u>Eligible Cost</u>
Design of Sewer, Water & Drain Improvements	\$ 146,500	\$ 20,000
Bid & Award of Construction Contract	\$ 20,000	\$ 10,000
Construction Administration Services/Inspection	\$ 65,000	\$ 15,000
Construction of Sewer, Water & Drain Improvements	\$ 2,523,200	\$ 460,100
Force Account (including Police)	\$ 270,400	\$ 54,000
<b>TOTAL ESTIMATED PROJECT COST</b>	<b>\$ 3,025,100</b>	<b><u>\$ 559,100</u></b>



MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 7  
ATTACHMENT B  
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P7-42-3-752

TOWN OF WINTHROP

DESIGN & CONSTRUCTION OF SEWER REPLACEMENT IN WALDEN ST, WALDEN  
PLACE, SHORT ST, READ ST & LINCOLN ST FROM WALDEN TO READ ST  
AND  
TV INSPECTION OF SEWERS ON SUMMIT AVE., LOCUST ST, GROVERS AVE.,  
GOVERNOR'S DRIVE & READ ST.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design of Sewer, Water & Drain Improvements	January 2012	April 2012
Bid & Award of Construction Contract	April 2012	May 2012
Construction of Sewer, Water & Drain Improvements	May 2012	June 2013

ATTACHMENT 5  
TO  
MWRA ANNUAL I/I REDUCTION REPORT FOR FY12  
Reporting Period: July 2011 Through June 2012

**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 FY12, MWRA has distributed \$221 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 FY12. Community information is summarized below:

**1. ARLINGTON: North System**

Background Information:

- Miles of Sewer: 106
- Sewered Population: 42,844
- Three Year ('09 - '11) Annual Average I/I: 2.78 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)

Private Source Inflow Removal Program:

- East End Sewer Study metering identified areas that will require additional study to identify possible sump pump/drain leader connections to the sewer.

I/I Rehabilitation Projects in Design or Construction:

- In September 2006, based upon the recommendations of an analysis of the Town's sewer system, the Town initiated a 12-year Sewer System Investigation and Planning Program (SSIPP). The purpose of this program was primarily to reduce I/I and mitigate the potential for sanitary sewer overflows (SSOs). Work would involve sewer

system investigation, evaluation, design and construction components in each year of the program. The project areas will contain approximately 47,000 LF of sewer per year.

- The Year #2 Sewer Rehabilitation Construction has been completed with warranty inspection and retesting being completed in March 2012.
- The Year #3 Sewer Rehabilitation Design was completed and approved by MWRA in August 2011. Bids were accepted in August 2011. Construction is ongoing with completion expected in June 2013.
- Final Punch lists items for The Sewer and Drain Improvements in the Mystic Bank Area were completed in January 2012.
- The Year #4 Design of Sewer Rehabilitations was completed in April 2012. Bids were accepted in May 2012. Construction is ongoing with completion expected in June 2013.

Reporting Period Activity:

- The Year #6 Sewer System Investigation Final Report was completed in November 2011.
- In August 2011, the Town's remaining Phase 7 allocation (\$185,600) was distributed to partially fund the Phase # 3 Sanitary Sewer Rehabilitation (Construction) Project. Defects identified during the previous Area # 1 through Area # 5 Investigation Projects are included in this project. (MWRA Project No. WRA-P7-01-3-741).

MWRA I/I Local Financial Assistance Program: The community has financed eighteen (18) I/I reduction projects through the Authority's funding assistance program. Of the \$5,613,000 allotted through the Program's Phases 1-8, the community has \$720,000 remaining in funding assistance.

## 2. ASHLAND: South System

Background Information:

- Miles of Sewer: 66
- Sewered Population: 11,847
- Three Year ('09 - '11) Annual Average I/I: 0.45 mgd
- MassDEP Administrative Actions: No. 594 (November 1985)

Latest I/I or SSES Report: I/I Investigation/Repair (Summary Report): September 2009

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 FY12:

Sub-Basin I: 77 inspections	Sub-Basin II: 120 inspections
Sub-Basin III: 30 inspections	Sub-Basin IV: 98 inspections

I/I Rehabilitation Projects in Design or Construction: DPW replaced 60 LF of dilapidated 12-inch sewer main (64,800 gpd of identified peak I/I removed) during August 2011. The Town also 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.

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. Of the \$1,328,500 allotted through the Program's Phases 1-8, the community has \$398,000 remaining in funding assistance.

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

Background Information:

- Miles of Sewer: 78
- Sewered Population: 13,150
- Three Year ('09 - '11) Annual Average I/I: 1.36 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.

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 are being completed during Summer 2012.

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: 22,912
- Three Year ('09 - '11) Annual Average I/I: 1.95 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Final Report on the I/I and Comprehensive Flow Monitoring Project was completed July 2009. The Sewer System Evaluation Survey Final Report was completed in October 2009.

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. The Belmont Uplands project is currently in negotiation.

I/I Rehabilitation Projects in Design or Construction:

- Design of the CWSRF funded illicit connection mitigation project is ongoing. The project is anticipated to be bid in the Fall 2012 with the construction being completed by the end of 2012.

Reporting Period Activity:

- Approximately 31,000' of sewers and storm drains on were inspected utilizing zoom camera technology in support of the Trapelo Road reconstruction project. Subsequent CCTV inspection and a preliminary design report will be completed in September. Completion of design is anticipated in the fall of 2012 with bidding and construction in 2013.
- Approximately 16,600' of sewers and storm drains were CCTV inspected in support of Belmont's pavement management program. The Town awarded a \$400,000 sewer and drain rehabilitation contract in May. Construction completion is anticipated in September.

- In May 2012, funds were distributed for the design & construction associated with a Town-wide Sewer Service Lateral & Mainline Sewer Rehabilitation Project. The purpose of this project is to identify sewer service laterals for repair and the cleaning & TV inspection of approximately 5,500 linear feet of mainline sewer that was recommended for inspection by the SSES Final Report of October 2009. (MWRA Project No. WRA-P7-04-3-756).

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: 607,744
- Three Year ('09 - '11) Annual Average I/I: 40.98 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-CY12, 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-three (73) projects have received funding through the MWRA I/I Local Financial Assistance Program. During FY07-FY12, 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.

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-three (73) 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 \$26,824,199 remaining in funding assistance.

## 6. BRAINTREE: South System

### Background Information:

- Miles of Sewer: 140
- Sewered Population: 34,388
- Three Year ('09 - '11) Annual Average I/I: 3.74 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)

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: Bestwick Road Infiltration Rehabilitation construction completed (replaced 300 LF of damaged VC sewer pipe with PVC sewer pipe). Mill Lane Infiltration Rehabilitation construction completed (replaced 50 LF of damaged VC sewer pipe with PVC sewer pipe).

Reporting Period Activity: Annual Town-Wide Sewer Program – Year One Investigation complete (Subareas S1 / W2 / HC2 / M2) (MWRA Project No. WRA-P7-06-3-748). Work included 34,895 LF of flow isolation, 49,540 LF of sewer television inspection and 230 topside manhole inspections. Jefferson Street Pump Station Rehabilitation completed. Lenox Farms Subdivision (41 buildings) completed.

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 \$5,319,000 allotted through the Program's Phases 1-8, the community has \$2,210,000 remaining in funding assistance.

## 7. BROOKLINE: North and South Systems

### Background Information:

- Miles of Sewer: 111
- Sewered Population: 54,699
- Three Year ('09 - '11) Annual Average I/I: 6.34 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 dated May 2012

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 linear feet of 48-inch sewer under the MBTA tracks on Beacon Street at Carlton Street; the installations of 12-inch sewer and 30-inch storm drain 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 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. Pipe work is 90% complete.

Reporting Period Activity:

- Town/BETA conducted I/I investigation NI-7, 8, and 12. Identified pipes for rehabilitation to reduce infiltration. Also identified areas on Englewood and Kilsyth with restricted flow due to excessive root growth. Contract to correct these problems will go out later this year.
- In November 2011, funds were distributed for conducting an I/I Investigation & Sewer System Rehabilitation Design for: 1.) Sewer Subareas NI-7, NI-8 & NI-12; 2.) Eliot Street Area; 3.) Englewood & Kilsyth Area. (MWRA Project No. WRA-P7-07-2-746).

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 \$8,605,200 allotted through the Program's Phases 1-8, the community has \$3,493,000 remaining in funding assistance.

## 8. BURLINGTON: North System

Background Information:

- Miles of Sewer: 115
- Sewered Population: 25,009
- Three Year ('09 - '11) Annual Average I/I: 1.84 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:

There have been 12 redirected private inflow sources removed in the last year with an additional 10 under design and construction. Another 5 private inflow sources are in the planning stage for a developer expecting to finish new development in the upcoming 6 months which would require the 5 sources to be redirected before opening. A large quantity inflow through a private commercial site's sewer network estimated to be 32,400 GPD has been cut, capped, and removed entirely from the Town's system. Finally, Weston & Sampson began house inspections in June 2012 with the intention of inspecting roughly 2,000 properties in the next 6 months.

I/I Rehabilitation Projects in Design or Construction:

Design of the Phase 5 Sanitary Sewer Rehabilitations (Contract No. SW-11-1140) was completed and bids were accepted in September 2011. Construction was substantially completed in January 2012. Warranty retest and inspection is scheduled for Spring 2013. Phase 5 Rehabilitations also included rehabilitations of I/I sources identified from Phase 4 Sewer System Rehabilitation Program Investigations. It is estimated that 305,712 GPD of infiltration has been removed and 227,729 GPD of inflow has been removed.

Reporting Period Activity:

- See Item #4 above for a list of Reports completed during the reporting period.
- A formal sewer bank credit request in the amount of 143,260 GPD, after all removal ratio requirements set forth by Mass DEP, has been submitted to Mass DEP as of July 2, 2012 for review. Assuming the credit request is approved in full, the Town's current sewer bank balance is 125,964 GPD as of July 19, 2012. The Town has used the majority of funding generated from selling sewer allocation, totaling \$681,430, from the Town's sewer bank to fund the 2012 (Phase 6) SSES and Building Inspections.
- In August 2012, funds were distributed to fund the Phase # 5 Sanitary Sewer Rehabilitations (Contract No. SW-11-1140) Project. This project will include the construction of the sewer rehabilitations as recommended by the Phase 4 SSES Report (June 2010), the Phase 5 Easement Manholes Inspections and the 100-Year Flood Plain Manhole Inflow Investigations. The specific sewer pipe rehabilitations will include but not be limited to: cleaning & CCTV inspection of sewer; joint testing & sealing; cured-in-place short liners; and testing & grouting of sewer service laterals. This rehabilitation work is generally listed in Table E-3 of the Phase 4 SSES Report (June 2010). The specific manhole rehabilitations will include but not be limited to: root treatment of manholes, cementitious lining of manholes and installation of manhole Inflow dishes. This rehabilitation work is generally listed in Tables 5 & 6 of the Draft Report entitled "Easement Manhole Inspections and Flood Plain Manhole Inflow Investigation" dated June 7, 2011. (MWRA Project No. WRA-P7-08-3-744).

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 \$3,304,800 allotted through the Program's Phases 1-8, the community has \$459,000 remaining in funding assistance.

## 9. CAMBRIDGE: North System

Background Information:

- Miles of Sewer: 148
- Sewered Population: 101,287
- Three Year ('09 - '11) Annual Average I/I: 7.49 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: Building inspections in Huron Avenue Contract Area B are currently ongoing. A total of 235 building inspections have been completed to date out of 387 buildings.

I/I Rehabilitation Projects in Design or Construction: The City continues implementation of its Stormwater Management Program. DPW continues to require developers to handle as much stormwater as possible on-site using dry wells and other storm water retention/detention devices.

Reporting Period Activity: Below is a list of ongoing I/I related projects:

- 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. The project is expected to be completed by May 2013. To date, 230 feet of new sewer and 60 feet of new storm drain have been installed.
- Forest Street Project Upper Oxford Street Side Streets – Sewer Separation and Stormwater Management – The second phase of this project includes Forest Street and will entail reconstruction of sewer, drainage and water lines as part of the Oxford Street Area Sewer Separation program. A new storm drain will be constructed and will result



in removal of some storm water flow to the MWRA sewer system. The project bid was awarded and work has begun. A total of 1711 feet of new storm drain will be installed, and 1264 feet of new sewer pipe will be installed as part of this project.

- The City cleaned the 36" by 40" diameter combined sewer on Cambridge Street between Oakland Street and Fulkerson Street; the 24" by 30" combined sewer on Albany & Portland Street from Mass. Avenue to Main Street; and the 32" by 28" sewer on Binney Street from Cardinal Medeiros to Land Boulevard.
- The City reconstructed 158 linear feet of combined sewer on Dunster Street; 78 linear feet of sewer on Washington Street and 59 linear feet of sewer on Saville Street.
- The City removed 4 catch basins that were connected to the sewer system and reconnected them to the storm drain system in the Normandy Avenue area.
- The Western Avenue project has been bid and is being awarded. A Notice to Proceed will be issued in August with work to begin in September 2012. Work will include construction of a new outfall and storm drain on Western Ave which will result in removal of storm water flow to the MWRA sewer system.
- The City has begun design on the Common Manhole Removal Contract No. 7. The Contract is expected to be bid in September 2012.

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 \$15,566,100 allotted through the Program's Phases 1-8, the community has \$5,789,045 remaining in funding assistance.

## **10. CANTON: South System**

Background Information:

- Miles of Sewer: 62
- Sewered Population: 14,355
- Three Year ('09 - '11) Annual Average I/I: 1.29 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: Greenlodge Interceptor Replacement Project is now complete. Subsystem 24 (York Brook / Linden Glen Area) rehabilitation design (cleaning/ testing/sealing of 7000 LF of sewer and rehabilitation of 18 manholes) complete.

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 ongoing. A scope of additional investigations and rehabilitation projects was completed at a conceptual level and design plans will be forthcoming in the next fiscal year.

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: 38,203
- Three Year ('09 - '11) 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 is in the process of implementing a developer-funded sewer bank for I/I removal improvements. The program is expected to be at a one-to-one ratio.

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

- Design of the Crescent Urban Renewal Area Utility Improvements has resumed in conjunction with 3<sup>rd</sup> party development. Design is anticipated to be complete fall 2012, with bidding winter 2013 for a spring 2013 construction start.
- Construction of the remaining portion of the Carter Street Sewer Replacement, between Everett Avenue and Vale Street, has been bid and awarded. Construction is anticipated to begin summer 2012 and be completed fall 2012.
- Construction on the Washington Avenue Project is almost complete. Drain installation is complete. The sewer portion will be completed by August 17, 2012.
- Rehabilitation of the Everett Avenue sewer between the MBCR tracks and Spruce Street is complete. This project included an open-cut point repair and approximately 700 linear feet of cured-in-place-pipe lining.
- Rehabilitation of the Webster Avenue sewer under Revere Beach Parkway has been bid and awarded. This project included approximately 540 linear feet of cured-in-place-pipe lining. Construction is anticipated to begin summer 2012 and be completed fall 2012.
- Preliminary Design for the Broadway Infrastructure Improvements Project has been bid and awarded. This project will include comprehensive sewer separation between City Hall Avenue and the Revere city line. Chelsea is currently evaluating funding sources and hopes to begin preliminary design fall 2012. The schedule for final design and construction has not yet been determined.

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: 89
- Sewered Population: 22,684
- Three Year ('09 - '11) Annual Average I/I: 2.19 mgd
- MassDEP Administrative Actions: AO Docket No. 547 (October 1985)

Latest I/I or SSES Report: Internal TV Inspection of Sewers (Letter Report - June 2004)  
Town-Wide Flow Monitoring (October 2011)

Private Source Inflow Removal Program: The Town adopted a sewer system enterprise fund at the May 2009 Town Meeting.

I/I Rehabilitation Projects in Design or Construction: The 2008 I/I Infiltration Rehabilitation Project (Contract No. 08-1 / MWRA Project Nos. WRA-P6-12-3-636 / 721) was completed March 2012 and resulted in elimination of approximately 1.44 mgd of peak infiltration. Project work included 48,356 LF of cleaning, TV inspection, joint testing and sealing; 1146 LF of short liners; 21,867 LF of CIP pipe; and 3252 VF of cementitious manhole lining.

The Town, as part of the 2011 on-call sewer repairs project, completed the installation of 20,295 LF of CIPP, 370 LF of short liners and 129 VF of cementitious manhole lining. The project removed an estimated 0.42 mgd of peak infiltration.

The community also continued its annual sewer system inspection program. Between April 2012 and May 2012, the Town cleaned and inspected 43,561 LF of sewer main. The Town plans to utilize this data to perform additional rehabilitation on the most cost-effective sewer lines/ manholes in the Summer/Fall 2012 utilizing an on-call contract.

Reporting Period Activity: See above work description.

MWRA I/I Local Financial Assistance Program: The community has financed thirteen (13) I/I reduction projects through the Authority's funding assistance program. Of the \$3,914,900 allotted through the Program's Phases 1-8, the community has \$473,000 remaining in funding assistance.

## 13. EVERETT: North System

### Background Information:

- Miles of Sewer: 57
- Sewered Population: 37,269
- Three Year ('09 - '11) Annual Average I/I: 2.08 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: I/I Investigation (July 2010)  
Sanitary Sewer Overflow Abatement Plan – Behan & Beacham Street Area Final Report  
(December 2009)

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 is approximately 80 percent complete. Additional work on Behan and Commercial remains, along with final paving and cleanup. Anticipated completion is December 2012.

This project is in compliance with Mass DEP Administrative Order NE-08-1N006 has been completed. Funding is being provided under the State SRF Program.

Reporting Period Activity: See above description of work.

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: 59,603
- Three Year ('09 - '11) Annual Average I/I: 2.49 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 (Final Review); 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 field reconnaissance efforts associated with the SSES programs are substantially complete. The DPW is still conducting comprehensive reviews of the SSES projects. No specific actions were conducted by the DPW towards the removal of any private inflow during the reporting period. The Town is taking an active role in the removal of all I/I sources from the system and is reviewing the recommendations of completed and ongoing studies to determine the most appropriate course of action for the removal of private inflow.

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 substantially complete June 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 substantially complete July 2012.

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 is scheduled for completion November 2012.

The East Framingham Sewer Improvements Project is scheduled for completion Winter 2012. The project includes 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 Grant and Pond Sewer Rehabilitation Project was completed in 2011. Project work included the replacement and rehabilitation of more than 5000 LF of sewer.

The Kendall/Freeman Sewer Replacement Project replaced approximately 1800 LF of 6 and 8-inch VC along Freeman Street, Torrey Street, Milton Street and Davis Street. Construction was completed November 2011.

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

The Eaton / Chalis / Nob Hill Pumping Stations Replacement Project will begin construction during Summer 2012. It involves the elimination of a sewer pumping station and replacement of 5000 LF of sewer.

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: 31
- Sewered Population: 6,869
- Three Year ('09 - '11) Annual Average I/I: 0.94 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 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 area. The Town will use Developer Flow Reduction Program funds (4 to 1 removal @ \$2.67/gallon) to identify I/I sources.

Reporting Period Activity: Construction of sewer extensions for Ship Street and Cottage Street scheduled to begin Fall 2012. 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. A portion of Thaxter Street was sewered between Kent's Lane and No. 30 Thaxter Street. Approximately 1100 LF of sewer was installed between these two projects and included eleven (11) new sewer connections.

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: 8,991
- Three Year ('09 - '11) Annual Average I/I: 0.34 mgd
- MassDEP Administrative Actions: ACOP-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 (7/06); DEP ACO Progress Report (6/08);  
CWSRF No. 2919 Contract No. 1 (10/09)

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). Smoke testing was conducted on 69,500 LF of sewer in Sub-areas B/H(7)/I and a portion of Sub-area A. 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. Phases 3/4 properties associated with collection system expansion are now being connected at owner's request. Phases 5/6 of collection system expansion remain on hold.

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: 30,211
- Three Year ('09 - '11) Annual Average I/I: 3.46 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)

Private Source Inflow Removal Program:

- The town is using the results from the June 2011 *Sewer Integrity Check for the Stimson, Grandview & Eastern Area and the Cary, Tufts & Spring Area* along with the February 2012 Private Inflow Removal Program to develop a private inflow program that will be adopted by the town. A total of 19 positive sources were identified in 315 buildings that contribute approximately 136,800 gpd of peak design storm inflow to the sanitary sewer.
- 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.

I/I Rehabilitation Projects in Design or Construction:

- Warranty re-inspection for Contract 10-29 and 11-24 will be completed in July 2012 and project closeout documents and as-builts will be finalized.
- The design of the "2012 Wastewater System Improvements (Contract No. 12-46)" was completed and bids were received on July 10, 2012. Contract has been awarded and construction is ongoing. It is estimated that Contract 12-46 will remove approximately 61,000 gpd of peak infiltration and 725,000 gpd of peak design storm inflow. Construction is scheduled to be completed in August 2012 with warranty re-inspection scheduled for spring 2013.
- Construction of *Marrett Road Sewer Improvements*, Contract 13-07 has been awarded and construction is scheduled to begin in summer/fall 2012. These sewer improvements were designed to repair structural defects in approximately 1,200 linear feet of sewer.

Reporting Period Activity:

- See Item #4 above for a list of reports completed during the report period.

- The town inspected approximately 140,000 linear feet of sewers and approximately 900 manholes in spring 2012. The town is currently reviewing the inspection data to develop a preliminary design to remove any identified infiltration and inflow.

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: 55,656
- Three Year ('09 - '11) Annual Average I/I: 4.53 mgd
- MassDEP Administrative Actions: None
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-002 (January 2009)

Latest I/I or SSES Report:

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

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

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 Annual I/I Questionnaire submitted in Aug. 2011, the City of Malden has continued with further characterizing its wastewater collection system and addressing I/I. The City has completed a 3 phased SSES program that has identified citywide sources of I/I. Planning, design, and construction of Phases 1 & 2 SSES projects are complete. The Phase 3 SSES draft report was submitted to the MWRA in Feb. 2011 for review. A final Phase 3 SSES was submitted to the MWRA in December 2011 that addressed comments made by the MWRA on the draft report. The City along with FS&T intends to move forward with design and construction over the coming months.
- In 2010, the City contracted CDM Smith to develop GIS system including data layers for both wastewater and storm drain collection systems and perform a sewer system capacity assessment (including InfoWorks hydraulic model) for its wastewater collection system. As part of the GIS development task, the City updated its wastewater and storm drain collection system data layers using record drawings, historic reports, planimetric aerial photography, and field reconnaissance. As part of the sewer system capacity assessment, the City developed an accurate sewer system hydraulic model for sewers 10” and greater in diameter using information collected under the GIS development task. In the spring of 2010, the City collected data from 20 flow meters, 2 rain gauges, and 4 groundwater gauges to assist in hydraulic model calibration. To further assist with model calibration, the MWRA provided valuable meter data at various MWRA flow meters in and around the City of Malden as well as a version of the 2010 MWRA InfoWorks Northern Collection System Model.
- A draft “Hydraulic Model and Capacity Assessment” report was submitted to the City in June of 2012. The City and CDM Smith will be meeting over the coming weeks to review the results of the report. Upon review and comment from the City, a revised copy of the report will be submitted to the MWRA for review and discussion. A follow up meeting with the MWRA will be conducted to review contents of the report. The sewer and storm drain GIS data layers have been developed and delivered to the City. The City is currently using the sewer and storm drain GIS data for various purposes. Sewer and storm drain data layers continue to be updated as additional data is collected. The sewer GIS data layer is more developed than the storm drain layer as the phased SSES program along with the hydraulic model and capacity assessment efforts have collected valuable connectivity and spatial data. The storm water layer is currently being updated by incorporation of recently obtained DCR record drawing

information as well as institutional information provided by the City. Updated sewer and storm drain GIS data layers will be provided to the City over the coming weeks to month.

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: 55,509
- Three Year ('09 - '11) Annual Average I/I: 4.32 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 Draft Report (November 2011)

Private Source Inflow Removal Program:

Nineteen sump pumps were found connected to the sanitary sewer in the recent SSES study area. A city-wide policy to disconnect sump pumps is being developed as part of the follow-up activities.

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

Reporting Period Activity:

The latest version of the Limited Sewer System Evaluation Survey of North Medford/Heights Area was submitted to MWRA in December 2011. Additional MWRA comments are being addressed. The specific work performed included but not be limited to: installation of 3 flowmeters for a period of 30 to 60 days in the Spring 2011; installation of a groundwater monitoring well; smoke testing of the sewers in the study area; dye testing at approximately 35 sites; house to house inspection at approximately 440 locations; manholes inspections at approximately 100 locations; performing internal TV inspections on approximately 20% of the sewer in the study area; preparation of a Draft and Final Report on the results of the field investigations and the recommendations for sewer rehabilitations. This study began in March 2011.

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: 26,755
- Three Year ('09 - '11) Annual Average I/I: 2.69 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:

- Under contract to City, private contractors performed 15 private sewer service repairs.
- Approximately 10 linear feet of 8" diameter sewer was replaced at the intersection of Forest & Lebanon St.



- During summer and fall of 2011, installed approximately 60 linear feet of new 24"x38" RCP sewer, 650 linear feet of new 30" DI sewer and 2 new sewer manholes to replace 800 linear feet of existing 30" VCP sewer and 2 existing sewer manholes on the East Side Sewer Interceptor; installed new flow meter on 30" DIP sewer to monitor sewer flows prior to entry into MWRA sewer main;

Reporting Period Activity:

- See above work description.
- During the Summer 2011, approximately 9,100 linear feet of 6", 8", 10", 12" & 18" diameter sewer was cleaned and TV inspected in an effort to identify sources of Infiltration/Inflow (I/I).
- Cleaned and inspected approximately 1,200 linear feet of 30" diameter VCP sewer to identify sources of I/I.

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: 24,433
- Three Year ('09 - '11) Annual Average I/I: 2.46 mgd
- MassDEP Administrative Actions: Amended AO Docket No. 580 (March 1986)

Latest I/I or SSES Report: Re-Prioritization Evaluation Report (March 2009)

Town-Wide Evaluation – Year 6 (March 2011)  
I/I Rehabilitation - Year 7 Investigation (December 2011)  
I/I Rehabilitation - Year 8 Investigation (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 began July 2012. Year 7 I/I Rehabilitation Investigation/Design was 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 6 I/I Rehabilitation Construction completed June 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 is ongoing.

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: 124
- Sewered Population: 27,786
- Three Year ('09 - '11) Annual Average I/I: 1.20 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 of 7300 LF of 8 and 10-inch sewers in Subsystems 10 / 12 / 15 / 19 / 20 in design phase (MWRA Project No. WRA-P7-22-3-761). Lined 1415 LF of 16-inch sewer on Worcester Road (Rte 9).

Reporting Period Activity: 226 Pond Street – 9 unit development added 340 LF of 8-inch PVC gravity sewer. Kylie Lane - 2 sewer connections added. Walnut Hill Drive - 5 sewer connections added. Heavey Estates - 4 sewer connections added. South Natick Hills – 268 unit condominium development; currently 124 units have tied in.

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: 131
- Sewered Population: 27,246
- Three Year ('09 - '11) Annual Average I/I: 2.23 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  
Report (January 2009)  
Sewer Infiltration Investigation for Subareas 16 and Lower 22  
Phase 2 Report (August 2011)

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 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. Project work is substantially complete. An estimated 0.04 mgd of peak infiltration was removed from the collection system.

The Phase 2 Infiltration Rehabilitation (Subareas 16 / Lower 22) Project (Needham Contract No. FY 12-07-01) included design and construction of sanitary sewer infiltration reduction measures. Project work was completed November 2011.

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 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. Project work was completed November 2010. An estimated 0.14 mgd of peak infiltration was removed from the collection system.

The Richardson Drive I/I Rehabilitation Project (MWRA Project No. WRA-P7-23-3-709 / Needham Contract No. FY 10-41-01) included design and construction of sanitary sewer I/I reduction measures and the demolition and rerouting of the Richardson Drive Pump Station. Project design was based upon findings from the report entitled 'Sewer Investigation in Richardson Drive, Stonehurst Road and Aldridge Road'. Project work included cleaning and TV inspection of 1300 LF of gravity sewer; testing and sealing 1300 LF of gravity sewer; testing and sealing 8 service wyes; chemical root treatment of 130 LF of 8-inch gravity sewer; sealing and coating 60 VF of manholes; and demolition of the Richardson Drive Pump Station and Force Main. Project work was completed August 2010. An estimated 0.10 mgd of peak I/I was removed from the collection system.

Reporting Period Activity: Reservoir B Pump Station replacement design complete. Replacement construction scheduled for completion Spring 2013. Reservoir B Pump Station rehabilitation construction funded at November 2011 Special Town Meeting.

The Town also appropriated \$575,000 in I/I Sewer Rehabilitation funding at its May 2011 Town Meeting.

Sewer Extensions: 371 LF of sewer pipe on Putnam Road installed by private developer; 262 LF of sewer pipe on Armen Way 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; 323 LF of sewer pipe on Greendale Avenue 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.

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: 82,022
- Three Year ('09 - '11) Annual Average I/I: 11.48 mgd
- MassDEP Administrative Actions: ACO-NE-00-1001  
ACOP-NE-96-1005 (March 1997)

### Latest I/I or SSES Reports:

"CIP – Project 1, 2 & 3 Smoke Testing" Report (July 2012)

"CIP – Project 1 Sewer System Evaluation Survey" Report (March 2012)

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

### Private Source Inflow Removal Program:

The City hired Weston & Sampson to inspect water meter installations and to perform building inspections for private sources of inflow, at residential properties throughout the City, during water meter installation. Weston & Sampson completed 9,799 building inspections for private inflow. Weston & Sampson identified five hundred fifty one (551) positive sources at four hundred sixty four (464) locations. The City hired Vanguard Utility Service, Inc. to complete the remainder of the building inspections. Vanguard completed 11,370 building inspections and identified an additional two hundred six (206) positive sources bringing the total to seven hundred fifty seven (757) positive sources. In the fall of 2011, the City began notifying residents whose property was identified as having a positive source. To date thirty three (33) positive sources have been removed.

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

- Final Inspection for the Area B Sanitary Sewer Rehabilitations Project was completed on July 5, 2012. Post-rehabilitation flow isolation has been postponed until suitable groundwater conditions exist. This project included installation of approximately 30,000 linear feet of cured-in-place pipe; sealing of the connection between the sanitary sewer system and the underdrain system in approximately 80 locations and lining of approximately 450 manholes.
- The Design of the recommended sewer rehabilitations for the Phase IA area is ongoing.

#### Reporting Period Activity:

- See above for description of design and construction work.
- The CIP – Project 1 Sewer System Evaluation Survey Study is ongoing.
- In August 2011 MWRA funds were distributed towards the following two (2) projects: Area B Sewer System Evaluation Survey (SSES) – Phase II Study which will identify sources of infiltration and inflow (I/I) in Sewer Subareas B028, B030, B033, B056, B057, B061, B062, B063 and B064. The field work associated with this project will include, but not be limited to: conducting top side physical survey of approximately 715 sewer manholes for sources of I/I; conducting flow isolation of approximately 125,000 LF of sewer; cleaning and internal TV inspection of approximately 125,000 LF of sewer; updating of sewer mapping/GIS database; preparing draft and final report on the results of the field work which will include cost-effectiveness analysis and recommendations for sewer rehabilitation; Area B Design & Construction of Phase IA Recommended Sewer Rehabilitations which includes the design and construction phases is a result of previous sewer investigation work. Under the Area B Phase I Sanitary Sewer Rehabilitation Project, internal TV inspection was performed in 32,500 LF of sewer. Review and preliminary design associated with recommended sewer rehabilitations is being completed under a separate project. The sewers that are recommended for rehabilitation will be included under the subject project. The sewer defects in Subareas B007, B010 and B071 that were identified in the 2007 Sewer/Underdrain Investigation were not included for rehabilitation in the Area B Phase I Sanitary Sewer Rehabilitation Project. These sewer defects will be included under the subject project. In March 2011, sewers tributary to the manhole located in the sidewalk at 27 Commonwealth Avenue were investigated to determine the source of contaminated underdrain flow in this area. Numerous underdrain cross connections and I/I related defects were identified. Several of the defects were rehabilitated under the Area B Phase I Sanitary Sewer Rehabilitation Project. The remainder will be included under the subject project. (MWRA Project No. WRA-P7-24-3-743).

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: 27,665
- Three Year ('09 - '11) Annual Average I/I: 2.69 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: Hawes Brook - Westover Parkway Area Sewer Rehabilitation Design (Contract No. NPW-12-03) completed December 2011 (Construction to be 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. 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 sixteen (16) 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 \$1,164,001 remaining in funding assistance.

## **26. QUINCY: South System**

Background Information:

- Miles of Sewer: 202
- Sewered Population: 91,613
- Three Year ('09 - '11) Annual Average I/I: 6.69 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)

Private Source Inflow Removal Program: Storm Water Discharge Ordinance has been approved. The ordinance forbids non-sanitary connections. 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 and is substantially complete. Warranty retesting work will be undertaken in Spring 2013. Phase IIA is estimated to remove 0.85 MGD of I/I.

Coastal Structures I/I Reduction Project Phase IIB will be designed Fall 2012 and bid Spring 2013. It is estimated that this Phase IIB project will remove 0.70 MGD of I/I.

Open cut repairs were conducted on a section of broken sewer pipe on Mallard Road in 2011. It was estimated that the repair removed 0.04 mgd of I/I. Additional rehabilitation on adjacent sewers at Seagull Road and Post Island Road will be part of the Coastal Structures I/I Reduction Project Phase IIA.

Reporting Period Activity: See above work description.

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: 30,138
- Three Year ('09 - '11) Annual Average I/I: 1.83 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)

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: Sewer System I/I Rehabilitation Project design complete. Rehabilitation construction completed Fall 2011 (Randolph Contract No. 10-S1 / MWRA Project No. WRA-P7-27-3-714). Total peak flow I/I removed is estimated to be 0.12 mgd.

The Town, working in conjunction with Avalon Bay, completed a manhole sealing and sewer lining project. The I/I removal project eliminated approximately 0.20 mgd.

Reporting Period Activity: Replacement of Summit Road / Fawn Circle / Donovan School Pump Stations was completed Fall 2011.

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: 22,158
- Three Year ('09 - '11) Annual Average I/I: 1.72 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report:

"Infiltration and Inflow (I/I) Investigations" Draft Report (June 2012)

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

Private Source Inflow Removal Program: The Town is continuing to work with property owners where illicit connections were found during the Building Inspection Program.

I/I Rehabilitation Projects in Design or Construction:

- The Town is continuing with its annual sewer rehabilitation program which for this period included cleaning & TV inspection of 15,942 LF of sewer, testing 2,007 main line joints, sealing 1631 main line joints, root treatment of 1,392 LF of sewer and sealing of 3 manholes.

#### Reporting Period Activity:

- In August 2011, funds were distributed towards the Implementation of Recommendations per the August 2010 Infiltration/inflow (I/I) Investigations Report. The specific I/I Identification work will consist of the following: flow isolation of approximately 8830 LF of sewer in Sewer Meter Areas 2B2 and 2B3; Smoke testing of approximately 237,000 linear feet of sewer in Sewer Meter Areas 3A, 3C, 3D, 4A, 4B and 5; dye testing at an estimated 75 locations based upon the results of the smoke testing. At the completion of the I/I identification work, a report will be prepared which will summarize the data collected and analysis thereof, present recommendations for further investigations and recommended sewer rehabilitations. The recommended sewer rehabilitation work will consist of performing TV inspection, joint testing and sealing of the sewer in Sewer Meter Areas 1 and 4A. The sewer rehabilitation work will also include the redirection of the storm drain at 2 locations; redirection of 5 catch basins; redirection of 1 sump pump; and the repair of 10 manhole frame seals. The specific locations of these sources are noted in the subject Report. (MWRA Project No. WRA-P7-28-3-742).

The Report on the smoke testing and dye testing field work was completed in June 2012. The flow isolation field work was delayed until the Fall 2012 due to the low groundwater in the Spring of 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: 78
- Sewered Population: 55,286
- Three Year ('09 - '11) Annual Average I/I: 3.92 mgd
- MassDEP Administrative Actions: No. 837 (April 1991)
- EPA Clean Water Act Administrative Order: EPA Docket No. 07-004 (April 2007)

#### Latest I/I or SSES Reports:

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

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

"Sewer System Evaluation Survey (SSES) Phase 1 Study Areas – CWSRF No. 3233" Final Report (July 31, 2010)

#### Private Source Inflow Removal Program:

- The City removed an additional four (4) illegal sump pumps during this period.
- The City recently awarded a contract to Granese Construction for the removal of another 17 private Inflow sources.
- The City continues to maintain an I/I removal ratio of 10:1 for new commercial and multi-family construction. These Sewer Mitigation Funds are used to perform sewer rehabilitations. There were no additional sewer mitigation funds received from developers during this reporting period.

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

The following sewer rehabilitations were completed:

- The City Bid No. MUN-2011-1001 contract was awarded to Insituform Technologies, Inc. in the amount of \$4,128,375. Under this contract, the City lined 11,920' of 8" sewer, 976' of 10" sewer, 1,445' of 15" sewer, 2,038' of 24" sewer, 728' of 30" sewer, and 525' of 34"x36" sewer. Lined 1,279 vertical feet of manholes and a total of

258 lateral service connections. Completed point repairs along Hichborn St. (5 l.f.), Revere Beach Parkway (7 l.f.), and Albert Ave. (8 l.f.).

- The City Bid No. MUN-2011-1002 contract was awarded to Aqualine Utility, Inc. for the construction of a new sewer system on Goldie, Bruno, Loomis, Griswold, and Malden Streets in the amount of \$1,571,005. Under this contract, the city installed 731 lf of 8” sewer on Bruno St., 820 lf of 8” sewer on Goldie St., 784 lf of 8” sewer on Loomis St., 252 lf of 8” sewer on Griswold St., and 221 lf of 8” sewer on Malden St. Also installed new sewer pump stations on Bruno St. and Malden St.

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: 74,405
- Three Year (‘09 - ‘11) Annual Average I/I: 5.80 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: A 4 to 1 I/I Reduction policy continues to be enforced with potential developers.

I/I Rehabilitation Projects in Design or Construction:

- **East Broadway Rehabilitation Project:**  
Plans and specifications (100% Set) for the project were submitted to MWRA for review and comment. All comments were incorporated into the final design package. Project was publically bid by MassDOT and construction is anticipated to begin this month (08/12). The project is estimated to remove approximately .0765 MGD of I/I from the existing system.
- **Middlesex Avenue Sewer/Drain Improvements:**  
Plans and specifications (100% Set) for the project were submitted to MWRA for review and comment. All comments were incorporated into the final design package. Project was publically bid by the City of Somerville and construction is anticipated to begin this month (08/12). The project is estimated to remove approximately 0.194 MGD of I/I from the existing system.

Reporting Period Activity:

- Work associated with the installation of a 72-inch storm drain outfall to handle the storm runoff from the Assembly Square Development Project has been completed. All storm water generated at the project site will be treated and conveyed to the Mystic River.
- In May 2012, funds were distributed for the bid/award & construction associated with the Middlesex Avenue Sewer Line Reconstruction Project. This project will include the replacement of approximately 500 linear feet of collapsed sewer that was identified during TV inspection and the installation of CIPP in approximately another 600 linear feet of sewer. (MWRA Project No. WRA-P7-30-3-754).



- In May 2012, funds were distributed for the East Broadway Sewer Rehabilitation & Replacement Project. This project is part of the overall reconstruction project of East Broadway from the Boston City Line to the intersection with McGrath Highway. The specific sewer rehabilitation work consists of: the cured-in-place pipe lining of approximately 6,250 linear feet of 8” to 24” diameter vitrified clay sewer; cured-in-place pipe lining of approximately 600 linear feet of 36” diameter brick sewer; replacement of approximately 1,350 linear feet of 10” to 20” diameter vitrified clay pipe with PVC pipe; lining of approximately 450 vertical feet of sewer manholes; replacement of approximately 4 sewer manholes and all appurtenances. (MWRA Project No. WRA-P7-30-3-760).

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: 21,121
- Three Year (‘09 - ‘11) Annual Average I/I: 1.84 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: Town Continues to inspect for Private inflow Sources during meter replacement or when property exchanges ownership.

I/I Rehabilitation Projects in Design or Construction:

- Phase 3 Sanitary Sewer Rehabilitation was substantially completed in the Summer/Fall of 2011. Warranty inspection of rehabilitation work is scheduled for Spring 2013.
- Phase 4 Sanitary Sewer Rehabilitation is currently being designed. 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:

- Unused MWRA I/I Funds from previous Funding Distributions and remaining MMDT Account Interest is being utilized for the ongoing Phase 4 Sewer System Rehabilitation design and construction.

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 \$3,291,900 allotted through the Program’s Phases 1-8, the community has \$424,000 remaining in funding assistance.

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

Background Information:

- Miles of Sewer: 72
- Sewered Population: 17,922
- Three Year ('09 - '11) Annual Average I/I: 2.19 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 (Ongoing)

Private Source Inflow Removal Program: 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 5 Sewer System Evaluation Report completed December 2009 (MWRA Project No. WRA-P7-32-3-704). Year 5 Sewer System Infiltration Rehabilitation Design completed June 2011. Year 5 Sewer System Infiltration Rehabilitation (Contract No. 11-1) completed July 2011 (MWRA Project No. WRA-P7-32-3-730). Year 6 Sewer System Evaluation Report completed March 2011. Year 7 Sewer System Evaluation Report completed December 2011 (MWRA Project No. WRA-P7-32-1-750). Year 6/7 Sewer System Infiltration Rehabilitation Design is ongoing. Year 8 Sewer System Evaluation is ongoing.

Reporting Period Activity: Sewer extension of approximately 9000 LF off Daly Drive by private developer ongoing. Sewer extension of approximately 3000 LF at Forest Green by private developer 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: 23,965
- Three Year ('09 - '11) Annual Average I/I: 3.17 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 completed the Municipal building inspections (19 buildings) to identify inflow sources. These inspections identified one (1) sump pump that was directly connected to the sewer system. A plan is being developed for removal of this sump pump.

- The town is also developing on-call sewer repair construction documents that will target infiltration and inflow source removal. These construction documents that are meant to remove known public and private sources. This contract will be publicly bid in the Summer/Fall of 2012.
- Town continues to receive 4 to 1 removal from completed subdivisions/developments.

I/I Rehabilitation Projects in Design or Construction:

- The town rehabilitated approximately 800 lf of sewers in July 2012
- Currently, the preparation of the Contract documents for the on-call sewer repair contract is being performed.

Reporting Period Activity:

- The town performed television inspection of approximately 6,000 linear feet of sewers in April 2012. These sewers were inspected in areas of town that will be paved in 2012 and the goal was to catalogue their condition prior to paving. Approximately 1,200 gallons per day (gpd) of infiltration was identified.
- The town is moving forward with television inspection of 8,000 linear feet and the rehabilitation of approximately 13,000 LF and 70 manholes. This will remove approximately 59,000 gpd of peak infiltration and 12,000 gpd of peak design storm inflow. This rehabilitation is based off of the recommendations from the May 2012 Subarea 3 Television Inspection of Sewers and Manhole Investigations in Subarea 3 and Subarea 6 Low-lying Areas. The estimated start date is the fall of 2012.
- The town completed 65,000 linear feet of smoke and dye testing in Subarea 3 in the summer of 2011. The smoke testing and dye testing is summarized in the November 2011 Subarea 3 Smoke Testing, Dye Testing & Dye Flooding Program. There was one direct private inflow source identified and the town has discussed removal with the homeowner.
- In May 2012, funds were distributed for the following 2 projects: 1.) Sewer Subarea #3 additional cleaning & internal TV inspection of sewers; 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: 16,391
- Three Year ('09 - '11) Annual Average I/I: 1.04 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 (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 4 I/I Investigation completed June 2011. Work was undertaken in Subareas 5/13 and included TV inspection of 83,647 LF of sewer and 437 topside manholes inspections. The work revealed an estimated 4465 gpd of peak infiltration. Year 6 I/I Investigation completed November 2011. Work was

undertaken in Subareas 8/15 and included TV inspection of 26,900 LF of sewer and 148 topside manholes inspections. The work revealed an estimated 35,425 gpd of peak infiltration. Year 6 I/I Investigation/Design is ongoing (MWRA Project No. WRA-P7-34-1-759).

Reporting Period Activity: Smoke / Dye Testing Report completed Summer 2011.

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: 60,265
- Three Year ('09 - '11) Annual Average I/I: 4.69 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:

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

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

Private Source Inflow Removal Program:

- Sump Pump Amnesty Program is continuing in Area 12 & Area 15.
  1. Progress: City is evaluating the feasibility of having private developers/contractors remove illegal sump pumps for I/I credit.
  2. Progress: City is considering surveying/inspecting balance of single family homes during the installation of new water meters.

I/I Rehabilitation Projects in Design or Construction:

The following sewer rehabilitations were performed under the Illicit Discharge Detection and Elimination (IDDE) Project for the period July 2011 to June 2012:

- Construction of Work Package No. 2, which involves I/I removal at 12 locations throughout the City is 80% complete. Estimated I/I removal for FY 2012 is 3,043 gpd.
- Construction contract for the sewer replacement in Totten Pond Road, Humboldt Street & Arcadia Avenue (Fed Corp). Project was completed on April 2012.
- Construction contract for sewer rehabilitations in Area 12A – Lakeview Area was awarded on July 21, 2011 and construction is 65% complete. As part of this project 2 sewer services have been replaced (main line to property line) with 34 remaining.
- Construction contract for I/I Rehabilitations in Area 15 – Poet's Area was awarded and construction is 25% complete August 2012. As part of this project 36 sewer services have been replaced (main line to property line).

Reporting Period Activity: See “I/I Rehabilitation Projects in Design or Construction” section

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: 32,521
- Three Year ('09 - '11) Annual Average I/I: 1.72 mgd
- MassDEP Administrative Actions: ACOP-NE-97-5004

Latest I/I or SSES Report: TV Inspection Report (Nichols Avenue & Boylston Street Sewers) (June 2009)

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.
- Forty-six (46) homes were inspected as part of the IDDE program. Four (4) illicit discharges to the storm drain were removed. No illicit discharges or Inflow sources to the sanitary sewer were identified.

I/I Rehabilitation Projects in Design or Construction:

- Construction of the "Lexington Street Water, Sewer & Drain Replacement" Project has been completed. This project included the replacement of approximately 440 LF of 6-inch VC sewer on Lexington Street between Warren Street and Bancroft Street with 8-inch PVC sewer. Estimated I/I removal was 0.047 mgd.
- Contract No. 10-01S was bid in August 2011 and awarded to J. D'Amico. Construction has been completed except for final paving and restoration. This project included the replacement of 308 lf of 10-inch diameter sewer on Fayette St, 581 lf of 10-inch diameter sewer on Boylston St, 688 lf of 15-inch diameter sewer and 43 lf of 10-inch diameter sewer on Nichols Ave. four (4) point repairs were also made. The estimated average I/I removal is 0.105 mgd.
- Under Contract No. 10-02S, the contractor has completed the preparatory cleaning and TV inspection on Nichols St and Boylston St for the installation on the CIPP liner. This work is anticipated to begin in September 2012.
- The Town also replaced 325 lf of 12-inch diameter sewer on Brown St from Sycamore St to Thayer Rd.

Reporting Period Activity:

- See "I/I Rehabilitation Projects in Design or Construction" section.
- In May 2012, funds were distributed for the construction associated with the replacement of approximately 1,342 linear feet of 10" diameter sewer in Hovey Street including 4 manholes, 30 sewer services and associated appurtenances. ( MWRA Project No. P7-36-3-757).

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: 26,364
- Three Year ('09 - '11) Annual Average I/I: 2.03 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 to be complete Summer 2012 (MWRA Project No. WRA-P7-37-3-758). To date 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 second year of Contract No. 09C-460-1366 Fuller Brook Area Sewer Inspection and Rehabilitation was completed August 2011 (MWRA Project No. WRA-P7-37-3-739). Approximately 49,146 LF of sanitary sewer mains were cleaned and CCTV inspected. Approximately 6012 joints of VC sewer pipe were tested and, of that, 1276 joints needed to be sealed and retested. This results in a failure rate of 21%. The estimated annual I/I reduction is approximately 15,800 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).

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: 13,310
- Three Year ('09 - '11) Annual Average I/I: 0.78 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 (CY10/11)

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. The Town has completed its Town-wide I/I Study.

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 ongoing and scheduled for completion summer 2012. Work includes 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.

Reporting Period Activity: See above work description.

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: 51,088
- Three Year ('09 - '11) Annual Average I/I: 4.55 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 324 sump pumps (for an estimated 162,000 gpd of inflow removal). Two sump pumps were redirected during FY12.

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) is ongoing and scheduled for completion Fall 2012. Work includes CIP lining of 3,587 LF of 15, 18 and 24-inch sewers and 105 VF of cementitious interior manhole lining. 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: The Town replaced 371 LF of existing 15-inch RC pipe with 15-inch PVC pipe along Neck Street. An emergency repair to the Warf Street Pump Station Force Main was performed in April 2012.

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: 4,032
- Three Year ('09 - '11) Annual Average I/I: 0.58 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Draft Infrastructure Maintenance and 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:

- Under the Main Street Interceptor Rehabilitation Project, an additional approximately 475 linear feet of sewer in Industrial Way was rehabilitated with the use of cured-in-place pipe liner. Also, approximately 150 linear feet of 8" diameter AC pipe was excavated and replaced on Industrial Way.

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: 21,116
- Three Year ('09 - '11) Annual Average I/I: 1.48 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)

Private Source Inflow Removal Program:

- The Town's Private Inflow Source Removal Program is ongoing. No illicit connections were removed 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:

- In May 2012, funds were distributed for performing a Sewer System Evaluation Survey (SSES) Study in the Squire Road & Meter #4 Areas of the Town in order to identify potential sources of I/I to the sewer system. (MWRA Project No. WRA-P7-41-1-763).
- Squire Road and Meter 4 area sewers were cleaned and televised in the Spring 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: 20 154
- Three Year ('09 - '11) Annual Average I/I: 1.31 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. Two more businesses have been re-plumbed to eliminate sump pump discharge into the town's system.

I/I Rehabilitation Projects in Design or Construction:

- The Nahant / Bellevue / Somerset Roadway and Infrastructure Project is completed. Approximately 680 linear feet of aged, clay sewer main was replaced with new PVC sewer pipe.
- Winthrop's latest project, Contract 3, is underway and will replace approximately 2,000 linear feet of aged, misaligned, and poorly pitched clay sewer main with new PVC sewer pipe.



Reporting Period Activity:

- In May 2012, funds were distributed for the TV Investigation of Sewers and Design & Construction of Sewer Rehabilitation/Repair in the Somerset Avenue, Bellevue Avenue, Eleanor Court & Nahant Street Areas. (MWRA Project No. WRA-P7-42-3-747).
- In May 2012, funds were distributed for the following 2 projects: 1.) Design & Construction of Sewer Replacement in Walden Street, Walden Place, Short Street, Read Street & Lincoln Street from Walden to Read Street; 2.) TV Inspection of Sewers on Summit Avenue, Locust Street, Grovers Avenue, Governor's Drive & Read Street. (MWRA Project No. WRA-P7-42-3-752).

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: 35,190
- Three Year ('09 - '11) Annual Average I/I: 3.73 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: No illicit connections were found or removed 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:

- Sewer blockages were repaired at 28 North Warren Street, 3 Middle Street, 7 Park Drive Extension & 8 Albany Street.

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 \$7,229,500 allotted through the Program's Phases 1-8, the community has \$871,000 remaining in funding assistance.

ATTACHMENT 6  
TO  
MWRA ANNUAL I/I REDUCTION REPORT FOR FY12  
Reporting Period – July 2011 Through June 2012

## CY11 COMMUNITY WASTEWATER FLOW DATA

This attachment contains calendar year 2011 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 CY11 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 CY11 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 CY11 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 CY11. 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 in 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 - CY11 MWRA WASTEWATER METERING SYSTEM COMMUNITY FLOW ESTIMATES

13-Jun-12

Page 1

Community	Total Population	Sewered Population	CY11 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	41,144	40,733	4.41	5.88	8.90	6.60	4.62	4.20	3.23	4.92	5.03	7.07	6.78	6.53	5.68	1.6%	8.90	1.8%
Ashland	15,796	11,847	1.10	1.24	1.47	1.15	1.09	1.02	0.89	1.21	1.41	1.50	1.48	1.46	1.25	0.4%	1.50	0.3%
Bedford	13,146	12,357	2.01	2.34	4.13	3.17	2.50	2.27	1.91	1.87	2.40	2.77	2.97	3.21	2.63	0.7%	4.13	0.8%
Belmont	23,356	22,912	2.83	4.13	5.86	4.13	2.74	2.51	1.84	2.85	3.26	4.52	4.11	4.17	3.58	1.0%	5.86	1.2%
BWSC	608,352	607,744	90.36	115.62	110.57	111.80	98.38	97.48	82.03	110.82	107.20	127.72	110.22	107.15	105.69	29.8%	127.72	26.1%
Braintree	34,422	34,388	6.66	9.12	10.45	8.88	7.16	6.25	5.27	5.31	6.51	10.29	8.92	8.92	7.80	2.2%	10.45	2.1%
Brookline	54,809	54,699	8.84	12.43	14.47	11.41	9.93	9.06	7.32	10.11	10.50	14.24	12.07	11.73	11.00	3.1%	14.47	3.0%
Burlington	25,034	25,009	3.32	4.01	6.29	4.88	4.04	3.49	3.02	3.15	3.43	4.22	3.82	3.95	3.97	1.1%	6.29	1.3%
Cambridge	101,388	101,287	14.59	19.22	19.61	19.37	16.47	17.36	14.81	21.46	18.97	22.30	18.45	17.59	18.34	5.2%	22.30	4.6%
Canton	21,916	14,355	2.60	3.40	4.48	3.03	2.23	2.03	1.79	1.80	1.99	2.75	2.99	2.97	2.67	0.8%	4.48	0.9%
Chelsea	38,203	38,203	4.87	6.58	5.92	6.11	5.06	4.89	3.79	5.76	5.25	6.57	5.68	5.51	5.49	1.5%	6.58	1.3%
Dedham	24,132	22,684	2.83	4.16	6.70	4.98	4.09	3.24	2.46	2.84	3.53	5.55	5.23	5.01	4.22	1.2%	6.70	1.4%
Everett	37,269	37,269	4.68	6.22	6.30	5.64	4.32	4.18	4.06	6.13	5.89	7.21	7.10	6.71	5.70	1.6%	7.21	1.5%
Frammingham	64,786	59,603	5.32	6.64	10.77	7.58	6.63	5.67	4.70	5.71	6.63	6.99	7.13	7.44	6.77	1.9%	10.77	2.2%
Hingham	7,555	6,869	1.44	1.95	2.06	1.85	1.39	1.13	0.94	0.93	1.13	1.82	1.77	1.74	1.51	0.4%	2.06	0.4%
Holbrook	10,663	8,991	0.79	1.00	1.11	0.97	0.79	0.65	0.62	0.61	0.70	0.99	0.96	0.91	0.84	0.2%	1.11	0.2%
Lexington	30,332	30,211	4.48	5.68	12.25	7.49	5.60	4.94	3.67	4.36	4.99	6.16	6.70	7.30	6.14	1.7%	12.25	2.5%
Malden	55,712	55,656	9.29	11.81	12.93	10.87	9.22	8.61	7.32	9.34	9.63	11.30	10.39	10.39	10.08	2.8%	12.93	2.6%
Medford	55,565	55,509	7.17	9.72	11.54	9.27	7.50	6.63	5.53	8.08	8.26	9.53	8.66	9.12	8.41	2.4%	11.54	2.4%
Melrose	26,782	26,755	3.68	5.27	7.30	5.53	3.60	3.39	2.83	5.10	5.19	6.66	5.90	6.08	5.04	1.4%	7.30	1.5%
Milton	26,272	24,433	3.17	5.00	6.38	4.74	3.60	2.81	2.04	2.58	3.24	5.64	5.35	5.01	4.12	1.2%	6.38	1.3%
Natick	31,975	27,786	2.81	3.52	4.99	3.92	3.23	2.84	2.35	2.76	3.44	3.54	3.82	3.95	3.43	1.0%	4.99	1.0%
Needham	28,263	27,246	3.59	4.69	7.01	5.10	3.46	2.79	2.01	3.00	4.39	5.12	5.17	5.07	4.28	1.2%	7.01	1.4%
Newton	83,271	82,022	14.24	20.48	30.64	21.92	16.18	13.45	10.09	14.76	18.34	24.55	24.01	24.02	19.38	5.5%	30.64	6.3%
Norwood	28,172	27,665	4.33	6.36	8.61	6.26	5.29	4.04	3.24	3.86	4.81	6.42	6.45	5.99	5.47	1.5%	8.61	1.8%
Quincy	91,622	91,613	13.71	17.08	18.75	16.36	14.33	13.45	12.11	13.22	14.31	18.96	17.43	17.60	15.60	4.4%	18.96	3.9%
Randolph	30,168	30,138	3.42	4.75	5.92	4.60	3.66	3.06	2.66	2.69	2.99	4.87	4.99	5.00	4.05	1.1%	5.92	1.2%
Reading	23,129	22,158	2.72	3.22	5.93	4.11	2.98	2.43	2.01	2.72	2.90	4.07	3.89	4.30	3.44	1.0%	5.93	1.2%
Revere	55,341	55,286	7.50	9.99	9.66	9.12	7.17	6.36	5.74	8.63	8.33	10.22	9.13	8.83	8.38	2.4%	10.22	2.1%
Somerville	74,405	74,405	9.56	14.84	14.01	11.85	8.50	8.30	7.56	11.89	12.24	15.06	11.90	11.32	11.39	3.2%	15.06	3.1%
Stoneham	21,508	21,121	3.06	3.76	6.08	4.42	2.96	2.53	2.22	3.90	3.93	4.54	4.61	4.50	3.88	1.1%	6.08	1.2%
Stoughton	26,951	17,922	2.34	3.38	4.84	4.02	3.78	3.02	2.51	2.59	2.99	4.63	4.52	4.38	3.58	1.0%	4.84	1.0%
Wakefield	24,706	23,965	3.88	5.05	8.54	6.34	4.67	3.66	2.91	5.08	4.89	6.06	5.88	5.73	5.23	1.5%	8.54	1.7%
Walpole	23,086	16,391	1.86	2.08	3.08	2.38	2.08	1.95	1.53	1.62	2.02	2.35	2.52	2.60	2.17	0.6%	3.08	0.6%
Waltham	60,325	60,265	8.49	12.62	18.87	12.48	9.28	8.59	7.42	9.25	9.73	11.38	11.41	11.70	10.93	3.1%	18.87	3.9%
Watertown	32,521	32,521	3.51	4.64	5.71	4.54	3.62	3.27	2.72	3.52	3.91	4.96	4.60	4.72	4.14	1.2%	5.71	1.2%
Wellesley	26,985	26,364	2.93	4.04	6.58	4.80	3.50	2.92	2.18	3.23	4.73	4.82	4.67	4.78	4.10	1.2%	6.58	1.3%
Westwood	14,010	13,310	1.36	1.78	2.30	1.55	1.38	1.21	1.08	1.09	1.40	1.89	1.90	1.89	1.57	0.4%	2.30	0.5%
Weymouth	53,272	51,088	7.33	10.19	11.66	9.92	7.98	6.53	5.67	5.84	6.95	10.21	10.10	9.78	8.50	2.4%	11.66	2.4%
Wilmington	21,679	4,032	1.40	1.35	1.66	1.49	1.23	1.37	1.23	1.34	1.48	1.45	1.38	1.42	1.40	0.4%	1.66	0.3%
Winchester	21,137	21,116	2.11	2.87	4.46	3.43	2.43	1.83	1.52	2.20	2.44	3.21	3.27	3.33	2.76	0.8%	4.46	0.9%
Winthrop	20,154	20,154	2.20	2.69	2.61	2.54	2.28	2.16	1.99	2.25	2.34	2.89	2.62	2.70	2.44	0.7%	2.69	0.6%
Woburn	37,042	35,190	6.31	8.49	14.68	9.81	7.36	6.57	4.84	6.15	6.45	8.67	9.00	9.27	8.13	2.3%	14.68	3.0%
Total/Average	2,146,356	2,073,272	293.10	389.29	466.08	390.41	318.31	294.14	245.66	326.53	340.15	425.67	389.95	385.78	355.16	100%	489.62	100%

**TABLE 2 - CY11 MWRA COMMUNITY WASTEWATER FLOW COMPONENT ESTIMATES (CY11-12 MONTHS)**

13-Jun-12

COMMUNITY	2011 Averages (1)					Components of Average Daily Flow (Estimated) (2)						Peak Month ADF (MGD)	Percent Peak Month ADF (6)			
	Community Demographics		No. of Connects to MWRA System	Miles of Local Sewers (3)	No. of Meters for Permanent System	Average Daily Flow		Selected Dry Day ADF (MGD)	Average Daily Infiltration		Average Sanitary Flow			Average Inflow		
	Total Population	Sewered Population				Average Daily Flow ADF (MGD)	Percent Average Daily Flow (6)		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
Arlington	41,144	40,733	321	106	7	5.68	1.60%	4.94	2.34	41.2%	2.60	45.8%	0.74	13.0%	8.90	1.82%
Ashland	15,796	11,847	2	66	2	1.25	0.35%	1.15	0.35	28.0%	0.80	64.0%	0.10	8.0%	1.50	0.31%
Bedford	13,146	12,357	2	78	2	2.63	0.74%	2.40	1.10	41.8%	1.30	49.4%	0.23	8.7%	4.13	0.84%
Belmont	23,356	22,912	2	78	2	3.58	1.01%	2.95	1.35	37.7%	1.60	44.7%	0.62	17.3%	5.86	1.20%
BWSC (5)	608,352	607,744	234	858	33	105.69	29.76%	88.56	30.56	28.9%	58.00	54.9%	17.13	16.2%	127.72	26.09%
Braintree	34,422	34,388	15	140	7	7.80	2.20%	6.98	3.78	48.5%	3.20	41.0%	0.82	10.5%	10.45	2.13%
Brookline (5)	54,809	54,699	9	111	12	11.00	3.10%	9.46	4.96	45.1%	4.50	40.9%	1.54	14.0%	14.47	2.96%
Burlington	25,034	25,009	0	115	1	3.97	1.12%	3.62	1.62	40.8%	2.00	50.4%	0.35	8.8%	6.29	1.28%
Cambridge (5)	101,388	101,287	116	148	9	18.34	5.16%	14.26	3.26	17.8%	11.00	60.0%	4.08	22.2%	22.30	4.55%
Canton	21,916	14,355	63	62	6	2.67	0.75%	2.39	1.19	44.6%	1.20	44.9%	0.28	10.5%	4.48	0.91%
Chelsea (5)	38,203	38,203	40	41	5	5.49	1.55%	4.31	1.51	27.5%	2.80	51.0%	1.18	21.5%	6.58	1.34%
Dedham	24,132	22,684	25	89	6	4.22	1.19%	3.68	1.88	44.5%	1.80	42.7%	0.54	12.8%	6.70	1.37%
Everett	37,269	37,269	20	57	7	5.70	1.60%	4.92	1.42	24.9%	3.50	61.4%	0.78	13.7%	7.21	1.47%
Frammingham	64,786	59,603	4	275	4	6.77	1.91%	6.01	1.51	22.3%	4.50	66.5%	0.75	11.1%	10.77	2.20%
Hingham	7,555	6,869	1	31	1	1.51	0.43%	1.32	0.92	60.9%	0.40	26.5%	0.19	12.6%	2.06	0.42%
Holbrook	10,663	8,991	2	31	2	0.84	0.24%	0.77	0.27	32.1%	0.50	59.5%	0.07	8.3%	1.11	0.23%
Lexington	30,332	30,211	17	170	4	6.14	1.73%	5.33	2.93	47.7%	2.40	39.1%	0.81	13.2%	12.25	2.50%
Malden	55,712	55,656	242	100	6	10.08	2.84%	9.13	4.13	41.0%	5.00	49.6%	0.95	9.4%	12.93	2.64%
Medford	55,565	55,509	71	113	6	8.41	2.37%	7.38	2.88	34.2%	4.50	53.5%	1.03	12.2%	11.54	2.36%
Melrose	26,782	26,755	187	74	5	5.04	1.42%	4.27	2.37	47.0%	1.90	37.7%	0.78	15.5%	7.30	1.49%
Milton	26,272	24,433	45	83	14	4.12	1.16%	3.50	2.10	51.0%	1.40	34.0%	0.63	15.3%	6.38	1.30%
Natick	31,975	27,786	27	124	4	3.43	0.97%	3.12	1.32	38.5%	1.80	52.5%	0.31	9.0%	4.99	1.02%
Needham	28,263	27,246	21	131	2	4.28	1.21%	3.66	1.67	39.0%	1.99	46.5%	0.62	14.5%	7.01	1.43%
Newton	83,271	82,022	51	271	7	19.38	5.46%	16.80	9.80	50.6%	7.00	36.1%	2.58	13.3%	30.64	6.26%
Norwood	28,172	27,665	30	83	6	5.47	1.54%	4.82	2.42	44.2%	2.40	43.9%	0.65	11.9%	8.61	1.76%
Quincy	91,622	91,613	56	202	6	15.60	4.39%	14.06	5.56	35.6%	8.50	54.5%	1.54	9.9%	18.96	3.87%
Randolph	30,168	30,138	2	101	2	4.05	1.14%	3.65	1.65	40.7%	2.00	49.4%	0.39	9.6%	5.92	1.21%
Reading	23,129	22,158	2	96	2	3.44	0.97%	3.04	1.54	44.8%	1.50	43.6%	0.40	11.6%	5.93	1.21%
Revere	55,341	55,286	3	78	3	8.38	2.36%	7.09	3.29	39.3%	3.80	45.3%	1.29	15.4%	10.22	2.09%
Somerville (5)	74,405	74,405	43	128	7	11.39	3.21%	8.34	3.04	26.7%	5.30	46.5%	3.06	26.9%	15.06	3.08%
Stoneham	21,508	21,121	23	63	7	3.88	1.09%	3.30	1.50	38.7%	1.80	46.4%	0.58	14.9%	6.08	1.24%
Stoughton	26,951	17,922	1	72	2	3.58	1.01%	3.26	1.76	49.2%	1.50	41.9%	0.33	9.2%	4.84	0.99%
Wakefield	24,706	23,965	10	93	2	5.23	1.47%	4.55	2.85	54.5%	1.70	32.5%	0.67	12.8%	8.54	1.74%
Walpole	23,086	16,391	1	59	2	2.17	0.61%	2.00	0.80	36.9%	1.20	55.3%	0.17	7.8%	3.08	0.63%
Waltham	60,325	60,265	3	138	3	10.93	3.08%	9.91	3.91	35.8%	6.00	54.9%	1.02	9.3%	18.87	3.85%
Watertown	32,521	32,521	14	75	3	4.14	1.17%	3.68	1.38	33.3%	2.30	55.6%	0.46	11.1%	5.71	1.17%
Wellesley	26,985	26,364	2	130	3	4.10	1.15%	3.51	1.81	44.1%	1.70	41.5%	0.59	14.4%	6.58	1.34%
Westwood	14,010	13,310	3	77	3	1.57	0.44%	1.43	0.63	40.1%	0.80	51.0%	0.14	8.9%	2.30	0.47%
Weymouth	53,272	51,088	17	238	4	8.50	2.39%	7.56	3.86	45.4%	3.70	43.5%	0.94	11.1%	11.66	2.38%
Wilmington	21,679	4,032	2	20	1	1.40	0.39%	1.33	0.53	37.9%	0.80	57.1%	0.07	5.0%	1.66	0.34%
Winchester	21,137	21,116	72	83	7	2.76	0.78%	2.43	1.33	48.2%	1.10	39.9%	0.33	12.0%	4.46	0.91%
Winthrop	20,154	20,154	21	36	6	2.44	0.69%	2.11	1.11	45.5%	1.00	41.0%	0.32	13.1%	2.89	0.59%
Woburn	37,042	35,190	18	141	13	8.13	2.29%	7.14	2.64	32.5%	4.50	55.4%	0.99	12.2%	14.68	3.00%
Totals/Averages	2,146,356	2,073,272	1,840	5,265	234	355.16	100.00%	304.12	126.83	35.7%	177.29	49.9%	51.05	14.4%	489.62	100.00%

**FOOTNOTES:**

- (1) Figures tabulated using data from the MWRA Wastewater Metering System for Calendar Year 2011.
- (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 2011 divided by 365 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 - CY11 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	40,733	106	954	5.68	2.34	0.74	2.60	5,954	3,229	2,453	776	6,981	64
Ashland	11,847	66	594	1.25	0.35	0.10	0.80	2,104	758	589	168	1,515	68
Bedford	12,357	78	702	2.63	1.10	0.23	1.30	3,746	1,895	1,567	328	2,949	105
Belmont	22,912	78	702	3.58	1.35	0.62	1.60	5,100	2,806	1,923	883	7,949	70
BWSC	607,744	858	13,728	105.69	30.56	17.13	58.00	7,699	3,474	2,226	1,248	19,965	95
Braintree	34,388	140	1,400	7.80	3.78	0.82	3.20	5,571	3,286	2,700	586	5,857	93
Brookline	54,699	111	1,332	11.00	4.96	1.54	4.50	8,258	4,880	3,724	1,156	13,874	82
Burlington	25,009	115	1,150	3.97	1.62	0.35	2.00	3,452	1,713	1,409	304	3,043	80
Cambridge	101,287	148	2,368	18.34	3.26	4.08	11.00	7,745	3,100	1,377	1,723	27,568	109
Canton	14,355	62	558	2.67	1.19	0.28	1.20	4,785	2,634	2,133	502	4,516	84
Chelsea	38,203	41	615	5.49	1.51	1.18	2.80	8,927	4,374	2,455	1,919	28,780	73
Dedham	22,684	89	890	4.22	1.88	0.54	1.80	4,742	2,719	2,112	607	6,067	79
Everett	37,269	57	684	5.70	1.42	0.78	3.50	8,333	3,216	2,076	1,140	13,684	94
Framingham	59,603	275	2,750	6.77	1.51	0.75	4.50	2,462	822	549	273	2,727	75
Hingham	6,869	31	279	1.51	0.92	0.19	0.40	5,412	3,978	3,297	681	6,129	58
Holbrook	8,991	31	310	0.84	0.27	0.07	0.50	2,710	1,097	871	226	2,258	56
Lexington	30,211	170	1,700	6.14	2.93	0.81	2.40	3,612	2,200	1,724	476	4,765	79
Malden	55,656	100	1,000	10.08	4.13	0.95	5.00	10,080	5,080	4,130	950	9,500	90
Medford	55,509	113	1,130	8.41	2.88	1.03	4.50	7,442	3,460	2,549	912	9,115	81
Melrose	26,755	74	662	5.04	2.37	0.78	1.90	7,614	4,759	3,580	1,178	10,605	71
Milton	24,433	83	747	4.12	2.10	0.63	1.40	5,515	3,655	2,811	843	7,590	57
Natick	27,786	124	1,240	3.43	1.32	0.31	1.80	2,766	1,315	1,065	250	2,500	65
Needham	27,246	131	1,310	4.28	1.67	0.62	1.99	3,267	1,748	1,275	473	4,733	73
Newton	82,022	271	2,710	19.38	9.80	2.58	7.00	7,151	4,568	3,616	952	9,520	85
Norwood	27,665	83	830	5.47	2.42	0.65	2.40	6,590	3,699	2,916	783	7,831	87
Quincy	91,613	202	2,020	15.60	5.56	1.54	8.50	7,723	3,515	2,752	762	7,624	93
Randolph	30,138	101	1,010	4.05	1.65	0.39	2.00	4,010	2,020	1,634	386	3,861	66
Reading	22,158	96	864	3.44	1.54	0.40	1.50	3,981	2,245	1,782	463	4,167	68
Revere	55,286	78	936	8.38	3.29	1.29	3.80	8,953	4,893	3,515	1,378	16,538	69
Somerville	74,405	128	1,920	11.39	3.04	3.06	5.30	5,932	3,177	1,583	1,594	23,906	71
Stoneham	21,121	63	567	3.88	1.50	0.58	1.80	6,843	3,668	2,646	1,023	9,206	85
Stoughton	17,922	72	720	3.58	1.76	0.33	1.50	4,972	2,903	2,444	458	4,583	84
Wakefield	23,965	93	930	5.23	2.85	0.67	1.70	5,624	3,785	3,065	720	7,204	71
Walpole	16,391	59	590	2.17	0.80	0.17	1.20	3,678	1,644	1,356	288	2,881	73
Waltham	60,265	138	1,380	10.93	3.91	1.02	6.00	7,920	3,572	2,833	739	7,391	100
Watertown	32,521	75	675	4.14	1.38	0.46	2.30	6,133	2,726	2,044	681	6,133	71
Wellesley	26,364	130	1,300	4.10	1.81	0.59	1.70	3,154	1,846	1,392	454	4,538	64
Westwood	13,310	77	693	1.57	0.63	0.14	0.80	2,266	1,111	909	202	1,818	60
Weymouth	51,088	238	2,380	8.50	3.86	0.94	3.70	3,571	2,017	1,622	395	3,950	72
Wilmington	4,032	20	280	1.40	0.53	0.07	0.80	5,000	2,143	1,893	250	3,500	198
Winchester	21,116	83	747	2.76	1.33	0.33	1.10	3,695	2,222	1,780	442	3,976	52
Winthrop	20,154	36	324	2.44	1.11	0.32	1.00	7,531	4,414	3,426	988	8,889	50
Woburn	35,190	141	1,410	8.13	2.64	0.99	4.50	5,766	2,574	1,872	702	7,021	128
Total	2,073,272	5,265	59,091	355.2	126.8	51.0	177.3						
Average	48,216	122	1,374	8.3	2.9	1.2	4.1	5,530	2,906	2,179	727	8,075	80

**TABLE 3 - CY11 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	607,744	BWSC	858	BWSC	13,728	BWSC	105.69	BWSC	30.56	BWSC	17.13	BWSC	58.00
Cambridge	101,287	Framingham	275	Framingham	2,750	Newton	19.38	Newton	9.80	Cambridge	4.08	Cambridge	11.00
Quincy	91,613	Newton	271	Newton	2,710	Cambridge	18.34	Quincy	5.56	Somerville	3.06	Quincy	8.50
Newton	82,022	Weymouth	238	Weymouth	2,380	Quincy	15.60	Brookline	4.96	Newton	2.58	Newton	7.00
Somerville	74,405	Quincy	202	Cambridge	2,368	Somerville	11.39	Malden	4.13	Malden	1.54	Waltham	6.00
Waltham	60,265	Lexington	170	Quincy	2,020	Brookline	11.00	Waltham	3.91	Quincy	1.54	Somerville	5.30
Framingham	59,603	Cambridge	148	Somerville	1,920	Waltham	10.93	Weymouth	3.86	Revere	1.29	Malden	5.00
Malden	55,656	Woburn	141	Lexington	1,700	Malden	10.08	Braintree	3.78	Chelsea	1.18	Brookline	4.50
Medford	55,509	Braintree	140	Woburn	1,410	Weymouth	8.50	Revere	3.29	Medford	1.03	Framingham	4.50
Revere	55,286	Waltham	138	Braintree	1,400	Medford	8.41	Cambridge	3.26	Waltham	1.02	Medford	4.50
Brookline	54,699	Needham	131	Waltham	1,380	Revere	8.38	Somerville	3.04	Woburn	0.99	Woburn	4.50
Weymouth	51,088	Wellesley	130	Brookline	1,332	Woburn	8.13	Lexington	2.93	Malden	0.95	Revere	3.80
Arlington	40,733	Somerville	128	Needham	1,310	Braintree	7.80	Medford	2.88	Weymouth	0.94	Weymouth	3.70
Chelsea	38,203	Natick	124	Wellesley	1,300	Framingham	6.77	Wakefield	2.85	Braintree	0.82	Everett	3.50
Everett	37,269	Burlington	115	Natick	1,240	Lexington	6.14	Lexington	2.64	Lexington	0.81	Braintree	3.20
Woburn	35,190	Medford	113	Burlington	1,150	Everett	5.70	Norwood	2.42	Everett	0.78	Chelsea	2.80
Braintree	34,388	Brookline	111	Medford	1,130	Arlington	5.68	Melrose	2.37	Melrose	0.78	Arlington	2.60
Watertown	32,521	Arlington	106	Randolph	1,010	Chelsea	5.49	Arlington	2.34	Framingham	0.75	Lexington	2.40
Lexington	30,211	Randolph	101	Malden	1,000	Norwood	5.47	Milton	2.10	Arlington	0.74	Norwood	2.40
Randolph	30,138	Malden	100	Arlington	954	Wakefield	5.23	Dedham	1.88	Wakefield	0.67	Watertown	2.30
Natick	27,786	Reading	96	Revere	936	Melrose	5.04	Wellesley	1.81	Norwood	0.65	Burlington	2.00
Norwood	27,665	Wakefield	93	Wakefield	930	Needham	4.28	Stoughton	1.76	Milton	0.63	Randolph	2.00
Needham	27,246	Dedham	89	Dedham	890	Dedham	4.22	Needham	1.67	Belmont	0.62	Needham	1.99
Melrose	26,755	Milton	83	Reading	864	Watertown	4.14	Randolph	1.65	Needham	0.62	Melrose	1.90
Wellesley	26,364	Norwood	83	Norwood	830	Milton	4.12	Burlington	1.62	Wellesley	0.59	Dedham	1.80
Burlington	25,009	Winchester	83	Milton	747	Wellesley	4.10	Reading	1.54	Stoneham	0.58	Natick	1.80
Milton	24,433	Bedford	78	Winchester	747	Randolph	4.05	Chelsea	1.51	Dedham	0.54	Stoneham	1.80
Wakefield	23,965	Belmont	78	Stoughton	720	Burlington	3.97	Framingham	1.51	Watertown	0.46	Wakefield	1.70
Belmont	22,912	Revere	78	Bedford	702	Stoneham	3.88	Stoneham	1.50	Reading	0.40	Reading	1.70
Dedham	22,684	Westwood	77	Belmont	702	Belmont	3.58	Everett	1.42	Everett	1.42	Randolph	1.60
Reading	22,158	Watertown	75	Westwood	693	Stoughton	3.58	Watertown	1.38	Watertown	1.38	Burlington	1.50
Stoneham	21,121	Melrose	74	Everett	684	Reading	3.44	Belmont	1.35	Belmont	1.35	Stoughton	1.50
Winchester	21,116	Stoughton	72	Watertown	675	Natick	3.43	Winchester	1.33	Winchester	1.33	Winchester	1.50
Winthrop	20,154	Ashland	66	Melrose	662	Winchester	2.76	Natick	1.32	Winthrop	0.32	Milton	1.40
Stoughton	17,922	Stoneham	63	Chelsea	615	Canton	2.67	Canton	1.19	Canton	0.31	Bedford	1.30
Walpole	16,391	Canton	62	Ashland	594	Bedford	2.63	Winthrop	1.11	Natick	0.31	Canton	1.20
Canton	14,355	Walpole	59	Walpole	590	Winthrop	2.44	Bedford	1.10	Canton	0.28	Walpole	1.20
Westwood	13,310	Everett	57	Stoneham	567	Walpole	2.17	Bedford	1.10	Bedford	0.23	Winchester	1.10
Bedford	12,357	Chelsea	41	Canton	558	Westwood	1.57	Hingham	0.92	Hingham	0.19	Hingham	1.00
Ashland	11,847	Winthrop	36	Winthrop	324	Hingham	1.51	Walpole	0.80	Walpole	0.17	Walpole	0.80
Holbrook	8,991	Hingham	31	Holbrook	310	Wilmington	1.40	Westwood	0.63	Westwood	0.14	Westwood	0.80
Hingham	6,869	Holbrook	31	Hingham	280	Ashland	1.25	Wilmington	0.53	Ashland	0.10	Wilmington	0.80
Wilmington	4,032	Wilmington	20	Hingham	279	Holbrook	0.84	Ashland	0.35	Holbrook	0.07	Holbrook	0.50
								Holbrook	0.27	Wilmington	0.07	Hingham	0.40
Total	2,073,272	Total	5,265	Total	59,091	Total	355.2	Total	126.8	Total	51.0	Total	177.3
Average	48,216	Average	122	Average	1,374	Average	8.3	Average	2.9	Average	1.2	Average	4.1

**TABLE 3 - CY11 Final Community Wastewater Flow Component Estimates (Ranked Detail page 3 of 3)**

Community	ADF (GPD Per IDM)	Community	II (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	10,080	Malden	5,080	Malden	4,130	Chelsea	1,919	Chelsea	28,780	Wilmington	198
Revere	8,953	Revere	4,893	Brookline	3,724	Cambridge	1,723	Cambridge	27,568	Woburn	128
Chelsea	8,927	Brookline	4,880	Newton	3,616	Somerville	1,594	Somerville	23,906	Cambridge	109
Everett	8,333	Melrose	4,759	Melrose	3,580	Revere	1,378	BWSC	19,965	Bedford	105
Brookline	8,258	Newton	4,568	Revere	3,515	BWSC	1,248	Revere	16,538	Waltham	100
Waltham	7,920	Winthrop	4,414	Winthrop	3,426	Melrose	1,178	Brookline	13,874	BWSC	95
Cambridge	7,745	Chelsea	4,374	Hingham	3,297	Brookline	1,156	Everett	13,684	Everett	94
Quincy	7,723	Hingham	3,978	Wakefield	3,065	Everett	1,140	Melrose	10,605	Melrose	93
BWSC	7,699	Wakefield	3,785	Norwood	2,916	Stoneham	1,023	Newton	9,520	Newton	93
Melrose	7,614	Norwood	3,699	Waltham	2,833	Winthrop	988	Malden	9,500	Malden	90
Winthrop	7,531	Stoneham	3,668	Milton	2,811	Newton	952	Stoneham	9,206	Norwood	87
Medford	7,442	Milton	3,655	Quincy	2,752	Malden	950	Medford	9,115	Newton	85
Newton	7,151	Waltham	3,572	Braintree	2,700	Medford	912	Winthrop	8,889	Stoneham	85
Stoneham	6,843	Quincy	3,515	Stoneham	2,646	Belmont	883	Belmont	7,949	Stoughton	84
Norwood	6,590	BWSC	3,474	Medford	2,549	Milton	843	Norwood	7,831	Canton	84
Watertown	6,133	Medford	3,460	Chelsea	2,455	Norwood	783	Quincy	7,624	Brookline	82
Arlington	5,954	Braintree	3,286	Arlington	2,453	Arlington	776	Milton	7,590	Medford	81
Somerville	5,932	Arlington	3,229	Stoughton	2,444	Quincy	762	Waltham	7,391	Waltham	80
Woburn	5,766	Everett	3,216	BWSC	2,226	Waltham	739	Wakefield	7,204	Wakefield	79
Wakefield	5,624	Somerville	3,177	Canton	2,133	Wakefield	720	Woburn	7,021	Dedham	79
Braintree	5,571	Cambridge	3,100	Dedham	2,112	Woburn	702	Arlington	6,981	Framingham	75
Milton	5,515	Stoughton	2,903	Everett	2,076	Watertown	681	Watertown	6,133	Chelsea	73
Hingham	5,412	Belmont	2,806	Watertown	2,044	Hingham	681	Hingham	6,129	Walpole	73
Belmont	5,100	Watertown	2,726	Belmont	1,923	Dedham	607	Dedham	6,067	Needham	73
Wilmington	5,000	Dedham	2,719	Wilmington	1,893	Braintree	586	Braintree	5,857	Weymouth	72
Stoughton	4,972	Canton	2,634	Woburn	1,872	Canton	502	Lexington	4,765	Somerville	71
Canton	4,785	Woburn	2,574	Reading	1,782	Lexington	476	Needham	4,733	Melrose	71
Dedham	4,742	Reading	2,245	Winchester	1,780	Needham	473	Stoughton	4,583	Wakefield	71
Randolph	4,010	Winchester	2,222	Lexington	1,724	Reading	463	Reading	4,538	Watertown	71
Reading	3,981	Lexington	2,200	Randolph	1,634	Stoughton	458	Canton	4,516	Belmont	70
Bedford	3,746	Wilmington	2,143	Weymouth	1,622	Wellesley	454	Reading	4,167	Revere	69
Winchester	3,695	Randolph	2,020	Somerville	1,583	Winchester	442	Winchester	3,976	Reading	68
Walpole	3,678	Weymouth	2,017	Bedford	1,567	Weymouth	395	Weymouth	3,950	Ashland	68
Lexington	3,612	Bedford	1,895	Burlington	1,409	Randolph	386	Randolph	3,861	Randolph	66
Weymouth	3,571	Wellesley	1,846	Wellesley	1,392	Bedford	328	Wilmington	3,500	Natick	65
Burlington	3,452	Needham	1,748	Cambridge	1,377	Burlington	304	Burlington	3,043	Wellesley	64
Needham	3,267	Burlington	1,713	Walpole	1,356	Walpole	288	Bedford	2,949	Arlington	64
Wellesley	3,154	Walpole	1,644	Needham	1,275	Framingham	273	Walpole	2,881	Westwood	60
Natick	2,766	Natick	1,315	Natick	1,065	Natick	250	Framingham	2,727	Hingham	58
Holbrook	2,710	Westwood	1,111	Westwood	909	Wilmington	250	Natick	2,500	Milton	57
Framingham	2,462	Holbrook	1,097	Holbrook	871	Holbrook	226	Holbrook	2,258	Holbrook	56
Westwood	2,266	Framingham	822	Ashland	589	Westwood	202	Westwood	1,818	Winchester	52
Ashland	2,104	Ashland	758	Framingham	549	Ashland	168	Ashland	1,515	Winthrop	50
Total											
Average	5,530	Average	2,906	Average	2,179	Average	727	Average	8,075	Average	80

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011													13-Jun-12	PAGE 1	Annual Average (MGD)
Calendar Year 2011 (MGD)															
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Ashland	Average Daily Flow	1.10	1.24	1.47	1.15	1.09	1.02	0.89	1.21	1.41	1.50	1.48	1.46	1.25	
	Dry Day Average Daily Flow	1.09	1.14	1.25	1.11	1.06	0.99	0.88	1.01	1.29	1.30	1.39	1.33	1.15	
	Estimated Infiltration	0.29	0.34	0.45	0.31	0.26	0.19	0.08	0.21	0.49	0.50	0.59	0.53	0.35	
	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	0.80
	Estimated Inflow	0.01	0.10	0.22	0.04	0.03	0.03	0.01	0.20	0.12	0.20	0.09	0.13	0.10	
Boston (South Only)	Raw Average Daily Flow	22.17	31.01	34.15	28.01	24.55	20.93	14.13	21.94	28.86	37.59	30.60	32.96	27.21	
	Raw Dry Day Average Daily Flow	19.56	27.91	29.38	25.81	21.61	18.96	12.51	17.27	26.32	29.87	27.49	27.79	23.66	
	Raw Estimated Infiltration	11.56	19.91	21.38	17.81	13.61	10.96	4.51	9.27	18.32	21.87	19.49	19.79	15.66	
	MWRA Estimated Infiltration	4.83	8.32	8.93	7.44	5.69	4.58	1.88	3.87	7.66	9.14	8.14	8.27	6.54	
	Final Average Daily Flow	17.34	22.69	25.22	20.57	18.86	16.35	12.25	18.07	21.20	28.45	22.46	24.69	20.67	
	Final Dry Day Average Daily Flow	14.73	19.59	20.45	18.37	15.92	14.38	10.63	13.40	18.66	20.73	19.35	19.52	17.12	
	Final Estimated Infiltration	6.73	11.59	12.45	10.37	7.92	6.38	2.63	5.40	10.66	12.73	11.35	11.52	9.12	
	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	8.00
	Estimated Inflow	2.61	3.10	4.77	2.20	2.94	1.97	1.62	4.67	2.54	7.72	3.11	5.17	3.55	
Braintree	Raw Average Daily Flow	7.21	10.03	11.54	9.74	7.78	6.74	5.65	5.63	7.03	11.24	9.79	9.78	8.50	
	Raw Dry Day Average Daily Flow	6.72	9.03	10.15	8.73	7.18	6.33	5.64	5.27	6.55	9.27	8.78	8.68	7.68	
	Raw Estimated Infiltration	3.52	5.83	6.95	5.53	3.98	3.13	2.44	2.07	3.35	6.07	5.58	5.48	4.48	
	MWRA Estimated Infiltration	0.55	0.91	1.09	0.86	0.62	0.49	0.38	0.32	0.52	0.95	0.87	0.86	0.70	
	Final Average Daily Flow	6.66	9.12	10.45	8.88	7.16	6.25	5.27	5.31	6.51	10.29	8.92	8.92	7.80	
	Final Dry Day Average Daily Flow	6.17	8.12	9.06	7.87	6.56	5.84	5.26	4.95	6.03	8.32	7.91	7.82	6.98	
	Final Estimated Infiltration	2.97	4.92	5.86	4.67	3.36	2.64	2.06	1.75	2.83	5.12	4.71	4.62	3.78	
	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	3.20
	Estimated Inflow	0.49	1.00	1.39	1.01	0.60	0.41	0.01	0.36	0.48	1.97	1.01	1.10	0.82	
Brookline (South Only)	Average Daily Flow	4.64	7.75	9.11	6.46	5.29	4.60	3.24	5.52	5.96	9.21	7.45	7.33	6.37	
	Dry Day Average Daily Flow	4.20	6.00	7.06	5.51	4.55	4.12	3.16	3.93	4.76	6.72	5.92	5.87	5.14	
	Estimated Infiltration	2.70	4.50	5.56	4.01	3.05	2.62	1.66	2.43	3.26	5.22	4.42	4.37	3.64	
	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	0.44	1.75	2.05	0.95	0.74	0.48	0.08	1.59	1.20	2.49	1.53	1.46	1.23	
Canton	Raw Average Daily Flow	2.80	3.67	4.84	3.28	2.36	2.13	1.87	1.87	2.08	2.88	3.19	3.18	2.84	
	Raw Dry Day Average Daily Flow	2.75	3.34	4.05	3.16	2.20	1.95	1.84	1.77	1.91	2.20	2.77	2.89	2.56	
	Raw Estimated Infiltration	1.55	2.14	2.85	1.96	1.00	0.75	0.64	0.57	0.71	1.00	1.57	1.69	1.36	
	MWRA Estimated Infiltration	0.20	0.27	0.36	0.25	0.13	0.10	0.08	0.07	0.09	0.13	0.20	0.21	0.17	
	Final Average Daily Flow	2.60	3.40	4.48	3.03	2.23	2.03	1.79	1.80	1.99	2.75	2.99	2.97	2.67	
	Final Dry Day Average Daily Flow	2.55	3.07	3.69	2.91	2.07	1.85	1.76	1.70	1.82	2.07	2.57	2.68	2.39	
	Final Estimated Infiltration	1.35	1.87	2.49	1.71	0.87	0.65	0.56	0.50	0.62	0.87	1.37	1.48	1.19	
	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	0.05	0.33	0.79	0.12	0.16	0.18	0.03	0.10	0.17	0.68	0.42	0.29	0.28	
Dedham	Average Daily Flow	2.83	4.16	6.70	4.98	4.09	3.24	2.46	2.84	3.53	5.55	5.23	5.01	4.22	
	Dry Day Average Daily Flow	2.78	3.35	5.46	4.43	3.67	3.03	2.37	2.58	3.23	4.38	4.55	4.31	3.68	
	Estimated Infiltration	0.98	1.55	3.66	2.63	1.87	1.23	0.57	0.78	1.43	2.58	2.75	2.51	1.88	
	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	0.05	0.81	1.24	0.55	0.42	0.21	0.09	0.26	0.30	1.17	0.68	0.70	0.54	



**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011													13-Jun-12	PAGE 2	Annual Average (MGD)
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Framingham	Raw Average Daily Flow	5.33	6.65	10.81	7.60	6.65	5.68	4.70	5.72	6.65	7.01	7.15	7.46	6.79	
	Raw Dry Day Average Daily Flow	5.27	5.92	8.19	6.84	6.05	4.99	4.53	5.12	6.04	6.18	6.67	6.58	6.03	
	Raw Estimated Infiltration	0.77	1.42	3.69	2.34	1.55	0.49	0.03	0.62	1.54	1.68	2.17	2.08	1.53	
	MWRA Estimated Infiltration	0.01	0.01	0.04	0.02	0.02	0.01	0.00	0.01	0.02	0.02	0.02	0.02	0.02	
	Final Average Daily Flow	5.32	6.64	10.77	7.58	6.63	5.67	4.70	5.71	6.63	6.99	7.13	7.44	6.77	
	Final Dry Day Average Daily Flow	5.26	5.91	8.15	6.82	6.03	4.98	4.53	5.11	6.02	6.16	6.65	6.56	6.01	
	Final Estimated Infiltration	0.76	1.41	3.65	2.32	1.53	0.48	0.03	0.61	1.52	1.66	2.15	2.06	1.51	
	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	0.06	0.73	2.62	0.76	0.60	0.69	0.17	0.60	0.61	0.83	0.48	0.88	0.75		
Hingham	Average Daily Flow	1.44	1.95	2.06	1.85	1.39	1.13	0.94	0.93	1.13	1.82	1.77	1.74	1.51	
	Dry Day Average Daily Flow	1.33	1.66	1.83	1.53	1.26	1.06	0.92	0.87	1.08	1.40	1.51	1.45	1.32	
	Estimated Infiltration	0.93	1.26	1.43	1.13	0.86	0.66	0.52	0.47	0.68	1.00	1.11	1.05	0.92	
	Estimated Sanitary Flow	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	
	Estimated Inflow	0.11	0.29	0.23	0.32	0.13	0.07	0.02	0.06	0.05	0.42	0.26	0.29	0.19	
Holbrook	Average Daily Flow	0.79	1.00	1.11	0.97	0.79	0.65	0.62	0.61	0.70	0.99	0.96	0.91	0.84	
	Dry Day Average Daily Flow	0.77	0.89	0.95	0.86	0.73	0.63	0.61	0.60	0.68	0.81	0.87	0.83	0.77	
	Estimated Infiltration	0.27	0.39	0.45	0.36	0.23	0.13	0.11	0.10	0.18	0.31	0.37	0.33	0.27	
	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	0.02	0.11	0.16	0.11	0.06	0.02	0.01	0.01	0.02	0.18	0.09	0.08	0.07	
Milton (South Only)	Average Daily Flow	2.88	4.59	5.76	4.26	3.26	2.55	1.83	2.37	2.90	5.16	4.87	4.51	3.74	
	Dry Day Average Daily Flow	2.64	3.73	4.77	3.58	2.81	2.30	1.77	2.33	2.56	3.78	4.09	3.73	3.17	
	Estimated Infiltration	1.39	2.48	3.52	2.33	1.56	1.05	0.52	1.08	1.31	2.53	2.84	2.48	1.92	
	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	0.24	0.86	0.99	0.68	0.45	0.25	0.06	0.04	0.34	1.38	0.78	0.78	0.57	
Natick	Average Daily Flow	2.81	3.52	4.99	3.92	3.23	2.84	2.35	2.76	3.44	3.54	3.82	3.95	3.43	
	Dry Day Average Daily Flow	2.75	3.12	4.21	3.68	3.01	2.71	2.27	2.36	3.13	3.14	3.48	3.56	3.12	
	Estimated Infiltration	0.95	1.32	2.41	1.88	1.21	0.91	0.47	0.56	1.33	1.34	1.68	1.76	1.32	
	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	0.06	0.40	0.78	0.24	0.22	0.13	0.08	0.40	0.31	0.40	0.34	0.39	0.31	
Needham	Average Daily Flow	3.59	4.69	7.01	5.10	3.46	2.79	2.01	3.00	4.39	5.12	5.17	5.07	4.28	
	Dry Day Average Daily Flow	3.57	4.11	5.61	4.39	3.13	2.58	1.93	2.51	3.41	4.15	4.42	4.17	3.66	
	Estimated Infiltration	1.57	2.11	3.61	2.39	1.13	0.58	0.03	0.51	1.41	2.15	2.42	2.17	1.67	
	Estimated Sanitary Flow	2.00	2.00	2.00	2.00	2.00	2.00	1.90	2.00	2.00	2.00	2.00	2.00	1.99	
	Estimated Inflow	0.02	0.58	1.40	0.71	0.33	0.21	0.08	0.49	0.98	0.97	0.75	0.90	0.62	
Newton (South Only)	Average Daily Flow	9.16	13.89	19.22	13.12	10.07	8.40	4.72	9.39	11.45	16.32	15.99	15.56	12.26	
	Dry Day Average Daily Flow	8.85	11.07	15.25	12.04	9.15	7.86	4.03	7.54	9.71	13.27	13.96	13.50	10.51	
	Estimated Infiltration	4.85	7.07	11.25	8.04	5.15	3.86	0.03	3.54	5.71	9.27	9.96	9.50	6.51	
	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	0.31	2.82	3.97	1.08	0.92	0.54	0.69	1.85	1.74	3.05	2.03	2.06	1.75	

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011													13-Jun-12	PAGE 3	Annual Average (MGD)
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Norwood	Raw Average Daily Flow	4.66	6.95	9.45	6.82	5.76	4.29	3.38	4.03	5.20	6.95	7.05	6.53	5.91	
	Raw Dry Day Average Daily Flow	4.51	6.15	7.75	5.97	5.40	3.97	3.30	3.50	4.90	5.79	6.21	5.82	5.27	
	Raw Estimated Infiltration	2.11	3.75	5.35	3.57	3.00	1.57	0.90	1.10	2.50	3.39	3.81	3.42	2.87	
	MWRA Estimated Infiltration	0.33	0.59	0.84	0.56	0.47	0.25	0.14	0.17	0.39	0.53	0.60	0.54	0.45	
	Final Average Daily Flow	4.33	6.36	8.61	6.26	5.29	4.04	3.24	3.86	4.81	6.42	6.45	5.99	5.47	
	Final Dry Day Average Daily Flow	4.18	5.56	6.91	5.41	4.93	3.72	3.16	3.33	4.51	5.26	5.61	5.28	4.82	
	Final Estimated Infiltration	1.78	3.16	4.51	3.01	2.53	1.32	0.76	0.93	2.11	2.86	3.21	2.88	2.42	
	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	0.15	0.80	1.70	0.85	0.36	0.32	0.08	0.53	0.30	1.16	0.84	0.71	0.65	
Quincy	Average Daily Flow	13.71	17.08	18.75	16.36	14.33	13.45	12.11	13.22	14.31	18.96	17.43	17.60	15.60	
	Dry Day Average Daily Flow	12.76	14.75	16.72	14.47	13.29	12.87	12.07	12.25	13.36	15.36	15.51	15.41	14.06	
	Estimated Infiltration	4.26	6.25	8.22	5.97	4.79	4.37	3.57	3.75	4.86	6.86	7.01	6.91	5.56	
	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	0.95	2.33	2.03	1.89	1.04	0.58	0.04	0.97	0.95	3.60	1.92	2.19	1.54	
Randolph	Average Daily Flow	3.42	4.75	5.92	4.60	3.66	3.06	2.66	2.69	2.99	4.87	4.99	5.00	4.05	
	Dry Day Average Daily Flow	3.26	4.16	5.07	4.12	3.37	2.91	2.62	2.62	2.90	4.01	4.47	4.39	3.65	
	Estimated Infiltration	1.26	2.16	3.07	2.12	1.37	0.91	0.62	0.62	0.90	2.01	2.47	2.39	1.65	
	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	0.16	0.59	0.85	0.48	0.29	0.15	0.04	0.07	0.09	0.86	0.52	0.61	0.39	
Stoughton	Raw Average Daily Flow	2.35	3.39	4.86	4.03	3.80	3.03	2.52	2.60	3.00	4.65	4.54	4.40	3.60	
	Raw Dry Day Average Daily Flow	2.27	2.96	3.92	3.47	3.55	3.01	2.41	2.56	2.92	4.13	4.13	3.91	3.27	
	Raw Estimated Infiltration	0.77	1.46	2.42	1.97	2.05	1.51	0.91	1.06	1.42	2.63	2.63	2.41	1.77	
	MWRA Estimated Infiltration	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	
	Final Average Daily Flow	2.34	3.38	4.84	4.02	3.78	3.02	2.51	2.59	2.99	4.63	4.52	4.38	3.58	
	Final Dry Day Average Daily Flow	2.26	2.95	3.90	3.46	3.53	3.00	2.40	2.55	2.91	4.11	4.11	3.89	3.26	
	Final Estimated Infiltration	0.76	1.45	2.40	1.96	2.03	1.50	0.90	1.05	1.41	2.61	2.61	2.39	1.76	
	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	0.08	0.43	0.94	0.56	0.25	0.02	0.11	0.04	0.08	0.52	0.41	0.49	0.33	
Walpole	Average Daily Flow	1.86	2.08	3.08	2.38	2.08	1.95	1.53	1.62	2.02	2.35	2.52	2.60	2.17	
	Dry Day Average Daily Flow	1.83	1.93	2.43	2.26	1.97	1.92	1.41	1.56	1.91	2.12	2.42	2.26	2.00	
	Estimated Infiltration	0.63	0.73	1.23	1.06	0.77	0.72	0.21	0.36	0.71	0.92	1.22	1.06	0.80	
	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	0.03	0.15	0.65	0.12	0.11	0.03	0.12	0.06	0.11	0.23	0.10	0.34	0.17	
Wellesley	Average Daily Flow	2.93	4.04	6.58	4.80	3.50	2.92	2.18	3.23	4.73	4.82	4.67	4.78	4.10	
	Dry Day Average Daily Flow	2.82	3.41	5.14	4.27	3.23	2.69	2.08	2.66	3.62	3.90	4.21	4.10	3.51	
	Estimated Infiltration	1.12	1.71	3.44	2.57	1.53	0.99	0.38	0.96	1.92	2.20	2.51	2.40	1.81	
	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	0.11	0.63	1.44	0.53	0.27	0.23	0.10	0.57	1.11	0.92	0.46	0.68	0.59	
Westwood	Average Daily Flow	1.36	1.78	2.30	1.55	1.38	1.21	1.08	1.09	1.40	1.89	1.90	1.89	1.57	
	Dry Day Average Daily Flow	1.33	1.58	1.87	1.44	1.33	1.18	1.06	1.00	1.32	1.67	1.72	1.68	1.43	
	Estimated Infiltration	0.53	0.78	1.07	0.64	0.53	0.38	0.26	0.20	0.52	0.87	0.92	0.88	0.63	
	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	0.03	0.20	0.43	0.11	0.05	0.03	0.02	0.09	0.08	0.22	0.18	0.21	0.14	

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011													13-Jun-12	PAGE 4
Calendar Year 2011 (MGD)														
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average (MGD)
Weymouth	Average Daily Flow	7.33	10.19	11.66	9.92	7.98	6.53	5.67	5.84	6.95	10.21	10.10	9.78	8.50
	Dry Day Average Daily Flow	6.98	8.85	9.99	8.47	7.28	6.18	5.59	5.50	6.73	8.03	8.90	8.33	7.56
	Estimated Infiltration	3.28	5.15	6.29	4.77	3.58	2.48	1.89	1.80	3.03	4.33	5.20	4.63	3.86
	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
	Estimated Inflow	0.35	1.34	1.67	1.45	0.70	0.35	0.08	0.34	0.22	2.18	1.20	1.45	0.94
Subtotal (Southern System)	Raw Average Daily Flow	104.37	144.41	181.37	140.90	116.50	99.14	76.54	98.11	120.13	162.63	150.67	151.50	128.74
	Raw Dry Day Average Daily Flow	98.04	125.06	151.05	126.14	105.83	92.24	73.00	84.81	108.33	131.48	133.47	130.59	113.22
	Raw Estimated Infiltration	45.29	72.31	98.30	73.39	53.08	39.49	20.35	32.06	55.58	78.73	80.72	77.84	60.48
	MWRA Estimated Infiltration	5.93	10.11	11.28	9.14	6.95	5.44	2.49	4.45	8.69	10.79	9.85	9.92	7.90
	Final Average Daily Flow	98.44	134.30	170.09	131.76	109.55	93.70	74.05	93.66	111.44	151.84	140.82	141.58	120.84
	Final Dry Day Average Daily Flow	92.11	114.95	139.77	117.00	98.88	86.80	70.51	80.36	99.64	120.69	123.62	120.67	105.32
	Final Estimated Infiltration	39.36	62.20	87.02	64.25	46.13	34.05	17.86	27.61	46.89	67.94	70.87	67.92	52.58
	Estimated Sanitary Flow	52.75	52.75	52.75	52.75	52.75	52.75	52.75	52.75	52.75	52.75	52.75	52.75	52.75
Estimated Inflow	6.33	19.35	30.32	14.76	10.67	6.90	3.54	13.30	11.80	31.15	17.20	20.91	15.52	
South System Pump Station as Reported by NPDES	Average Daily Flow	110.30	151.10	191.30	148.50	121.00	105.30	84.20	104.90	123.70	170.70	160.30	157.20	135.60

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011													PAGE 5			
Community	Flow Characteristic	13-Jun-12											Annual Average (MGD)			
		Calendar Year 2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Arlington	Raw Average Daily Flow	4.47	5.98	9.08	6.73	4.68	4.25	3.25	4.99	5.10	7.20	6.92	6.65	5.77		
	Raw Dry Day Average Daily Flow	4.18	5.14	7.09	6.02	4.23	3.88	3.18	4.31	4.49	5.98	6.24	5.73	5.04		
	Raw Estimated Infiltration	1.58	2.54	4.49	3.42	1.63	1.28	0.58	1.71	1.89	3.38	3.64	3.13	2.44		
	MWRA Estimated Infiltration	0.06	0.10	0.18	0.13	0.06	0.05	0.02	0.07	0.07	0.13	0.14	0.12	0.09		
	Final Average Daily Flow	4.41	5.88	8.90	6.60	4.62	4.20	3.23	4.92	5.03	7.07	6.78	6.53	5.68		
	Final Dry Day Average Daily Flow	4.12	5.04	6.91	5.89	4.17	3.83	3.16	4.24	4.42	5.85	6.10	5.61	4.94		
	Final Estimated Infiltration	1.52	2.44	4.31	3.29	1.57	1.23	0.56	1.64	1.82	3.25	3.50	3.01	2.34		
	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	0.29	0.84	1.99	0.71	0.45	0.37	0.07	0.68	0.61	1.22	0.68	0.92	0.74		
Bedford	Average Daily Flow	2.01	2.34	4.13	3.17	2.50	2.27	1.91	1.87	2.40	2.77	2.97	3.21	2.63		
	Dry Day Average Daily Flow	1.92	2.13	3.18	2.88	2.38	2.07	1.87	1.72	2.33	2.51	2.84	2.92	2.40		
	Estimated Infiltration	0.62	0.83	1.88	1.58	1.08	0.77	0.57	0.42	1.03	1.21	1.54	1.62	1.10		
	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	0.09	0.21	0.95	0.29	0.12	0.20	0.04	0.15	0.07	0.26	0.13	0.29	0.23		
Belmont	Average Daily Flow	2.83	4.13	5.86	4.13	2.74	2.51	1.84	2.85	3.26	4.52	4.11	4.17	3.58		
	Dry Day Average Daily Flow	2.68	3.32	4.34	3.41	2.45	2.17	1.72	2.21	2.66	3.44	3.53	3.53	2.95		
	Estimated Infiltration	1.08	1.72	2.74	1.81	0.85	0.57	0.12	0.61	1.06	1.84	1.93	1.93	1.35		
	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	0.15	0.81	1.52	0.72	0.29	0.34	0.12	0.64	0.60	1.08	0.58	0.64	0.62		
Boston (North Only)	Charlestown	Raw Average Daily Flow	2.53	3.92	3.33	3.29	2.20	2.65	2.21	3.55	2.69	2.86	3.46	3.43	3.00	
		Raw Dry Day Average Daily Flow	1.88	3.36	2.21	2.22	1.45	1.88	1.86	1.98	2.14	1.77	2.87	2.59	2.17	
		Raw Estimated Infiltration	0.48	1.96	0.81	0.82	0.05	0.48	0.46	0.58	0.74	0.37	1.47	1.19	0.77	
		MWRA Estimated Infiltration	0.07	0.30	0.13	0.13	0.01	0.07	0.07	0.09	0.11	0.06	0.23	0.18	0.12	
		Final Average Daily Flow	2.46	3.62	3.20	3.16	2.19	2.58	2.14	3.46	2.58	2.80	3.23	3.25	2.88	
		Final Dry Day Average Daily Flow	1.81	3.06	2.08	2.09	1.44	1.81	1.79	1.89	2.03	1.71	2.64	2.41	2.05	
		Final Estimated Infiltration	0.41	1.66	0.68	0.69	0.04	0.41	0.39	0.49	0.63	0.31	1.24	1.01	0.65	
		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	0.65	0.56	1.12	1.07	0.75	0.77	0.35	1.57	0.55	1.09	0.59	0.84	0.83	
		Columbus Park	Raw Average Daily Flow	31.98	42.27	37.47	37.51	32.73	34.31	29.30	43.39	39.28	46.99	40.70	36.57	37.67
			Raw Dry Day Average Daily Flow	27.11	33.82	33.22	29.59	29.01	26.59	27.17	30.41	31.80	31.20	31.71	27.39	29.89
			Raw Estimated Infiltration	7.11	13.82	13.22	9.59	9.01	6.59	7.17	10.41	11.80	11.20	11.71	7.39	9.89
			MWRA Estimated Infiltration	0.22	0.43	0.41	0.30	0.28	0.21	0.22	0.32	0.37	0.35	0.37	0.23	0.31
Final Average Daily Flow	31.76		41.84	37.06	37.21	32.45	34.10	29.08	43.07	38.91	46.64	40.33	36.34	37.36		
Final Dry Day Average Daily Flow	26.89		33.39	32.81	29.29	28.73	26.38	26.95	30.09	31.43	30.85	31.34	27.16	29.58		
Final Estimated Infiltration	6.89		13.39	12.81	9.29	8.73	6.38	6.95	10.09	11.43	10.85	11.34	7.16	9.58		
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	4.87		8.45	4.25	7.92	3.72	7.72	2.13	12.98	7.48	15.79	8.99	9.18	7.78		
East Boston	Raw Average Daily Flow	6.19	7.69	6.72	6.93	6.73	6.12	4.94	7.57	6.88	8.04	7.32	6.93	6.83		
	Raw Dry Day Average Daily Flow	5.64	6.26	5.37	5.61	5.34	4.45	4.67	5.66	5.58	5.19	5.99	5.61	5.44		
	Raw Estimated Infiltration	2.04	2.66	1.77	2.01	1.74	0.85	1.07	2.06	1.98	1.59	2.39	2.01	1.84		
	MWRA Estimated Infiltration	0.19	0.25	0.16	0.19	0.16	0.08	0.10	0.19	0.18	0.15	0.22	0.19	0.17		
	Final Average Daily Flow	6.00	7.44	6.56	6.74	6.57	6.04	4.84	7.38	6.70	7.89	7.10	6.74	6.66		
	Final Dry Day Average Daily Flow	5.45	6.01	5.21	5.42	5.18	4.37	4.57	5.47	5.40	5.04	5.77	5.42	5.27		
	Final Estimated Infiltration	1.85	2.41	1.61	1.82	1.58	0.77	0.97	1.87	1.80	1.44	2.17	1.82	1.67		
	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	0.55	1.43	1.35	1.32	1.39	1.67	0.27	1.91	1.30	2.85	1.33	1.32	1.39		

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011													13-Jun-12	PAGE 6	Annual Average (MGD)
Community	Flow Characteristic	Calendar Year 2011													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Ward Street	Raw Average Daily Flow	33.88	42.25	40.58	47.22	40.22	40.40	34.96	39.92	39.32	43.63	38.58	37.57	39.84	
	Raw Dry Day Average Daily Flow	32.02	39.50	38.38	45.23	37.43	37.99	33.11	32.06	34.87	36.03	34.67	34.39	36.26	
	Raw Estimated Infiltration	7.02	14.50	13.38	20.23	12.43	12.99	8.11	7.06	9.87	11.03	9.67	9.39	11.26	
	MWRA Estimated Infiltration	1.08	2.22	2.05	3.10	1.91	1.99	1.24	1.08	1.51	1.69	1.48	1.44	1.73	
	Final Average Daily Flow	32.80	40.03	38.53	44.12	38.31	38.41	33.72	38.84	37.81	41.94	37.10	36.13	38.12	
	Final Dry Day Average Daily Flow	30.94	37.28	36.33	42.13	35.52	36.00	31.87	30.98	33.36	34.34	33.19	32.95	34.53	
	Final Estimated Infiltration	5.94	12.28	11.33	17.13	10.52	11.00	6.87	5.98	8.36	9.34	8.19	7.95	9.53	
	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	25.00
	Estimated Inflow	1.86	2.75	2.20	1.99	2.79	2.41	1.85	7.86	4.45	7.60	3.91	3.18	3.58	
Boston (North Total)	Raw Average Daily Flow	74.58	96.13	88.10	94.95	81.88	83.48	71.41	94.43	88.17	101.52	90.06	84.50	87.34	
	Raw Dry Day Average Daily Flow	66.65	82.94	79.18	82.65	73.23	70.91	66.81	70.11	74.39	74.19	75.24	69.98	73.76	
	Raw Estimated Infiltration	16.65	32.94	29.18	32.65	23.23	20.91	16.81	20.11	24.39	24.19	25.24	19.98	23.76	
	MWRA Estimated Infiltration	1.56	3.20	2.75	3.72	2.36	2.35	1.63	1.68	2.17	2.25	2.30	2.04	2.32	
	Final Average Daily Flow	73.02	92.93	85.35	91.23	79.52	81.13	69.78	92.75	86.00	99.27	87.76	82.46	85.02	
	Final Dry Day Average Daily Flow	65.09	79.74	76.43	78.93	70.87	68.56	65.18	68.43	72.22	71.94	72.94	67.94	71.44	
	Final Estimated Infiltration	15.09	29.74	26.43	28.93	20.87	18.56	15.18	18.43	22.22	21.94	22.94	17.94	21.44	
	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	7.93	13.19	8.92	12.30	8.65	12.57	4.60	24.32	13.78	27.33	14.82	14.52	13.58	
Brookline (North Only)	Average Daily Flow	4.20	4.68	5.36	4.95	4.64	4.46	4.08	4.59	4.54	5.03	4.62	4.40	4.63	
	Dry Day Average Daily Flow	4.08	4.40	4.83	4.70	4.58	4.20	4.01	3.91	4.31	4.51	4.31	3.95	4.31	
	Estimated Infiltration	1.08	1.40	1.83	1.70	1.58	1.20	1.01	0.91	1.31	1.51	1.31	0.95	1.31	
	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	
	Estimated Inflow	0.12	0.28	0.53	0.25	0.06	0.26	0.07	0.68	0.23	0.52	0.31	0.45	0.31	
Burlington	Average Daily Flow	3.32	4.01	6.29	4.88	4.04	3.49	3.02	3.15	3.43	4.22	3.82	3.95	3.97	
	Dry Day Average Daily Flow	3.28	3.61	4.86	4.62	3.79	3.23	2.97	2.93	3.32	3.82	3.45	3.54	3.62	
	Estimated Infiltration	1.28	1.61	2.86	2.62	1.79	1.23	0.97	0.93	1.32	1.82	1.45	1.54	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	0.04	0.40	1.43	0.26	0.25	0.26	0.05	0.22	0.11	0.40	0.37	0.41	0.35	
Cambridge	Raw Average Daily Flow	14.96	20.07	20.67	20.10	17.02	17.78	15.30	21.96	19.48	22.86	19.00	18.04	18.93	
	Raw Dry Day Average Daily Flow	13.44	16.59	18.01	15.78	14.60	13.79	14.21	14.27	14.37	14.66	14.64	13.96	14.85	
	Raw Estimated Infiltration	2.44	5.59	7.01	4.78	3.60	2.79	3.21	3.27	3.37	3.66	3.64	2.96	3.85	
	MWRA Estimated Infiltration	0.37	0.85	1.06	0.73	0.55	0.42	0.49	0.50	0.51	0.56	0.55	0.45	0.58	
	Final Average Daily Flow	14.59	19.22	19.61	19.37	16.47	17.36	14.81	21.46	18.97	22.30	18.45	17.59	18.34	
	Final Dry Day Average Daily Flow	13.07	15.74	16.95	15.05	14.05	13.37	13.72	13.77	13.86	14.10	14.09	13.51	14.26	
	Final Estimated Infiltration	2.07	4.74	5.95	4.05	3.05	2.37	2.72	2.77	2.86	3.10	3.09	2.51	3.26	
	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	1.52	3.48	2.66	4.32	2.42	3.99	1.09	7.69	5.11	8.20	4.36	4.08	4.08	
Chelsea	Raw Average Daily Flow	5.04	6.88	6.18	6.35	5.25	5.01	3.89	5.91	5.40	6.76	5.87	5.69	5.68	
	Raw Dry Day Average Daily Flow	4.37	5.53	5.21	4.95	4.52	3.87	3.69	4.14	4.19	4.57	4.57	4.45	4.50	
	Raw Estimated Infiltration	1.57	2.73	2.41	2.15	1.72	1.07	0.89	1.34	1.39	1.77	1.77	1.65	1.70	
	MWRA Estimated Infiltration	0.17	0.30	0.26	0.24	0.19	0.12	0.10	0.15	0.15	0.19	0.19	0.18	0.19	
	Final Average Daily Flow	4.87	6.58	5.92	6.11	5.06	4.89	3.79	5.76	5.25	6.57	5.68	5.51	5.49	
	Final Dry Day Average Daily Flow	4.20	5.23	4.95	4.71	4.33	3.75	3.59	3.99	4.04	4.38	4.38	4.27	4.31	
	Final Estimated Infiltration	1.40	2.43	2.15	1.91	1.53	0.95	0.79	1.19	1.24	1.58	1.58	1.47	1.51	
	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	0.67	1.35	0.97	1.40	0.73	1.14	0.20	1.77	1.21	2.19	1.30	1.24	1.18	

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011														13-Jun-12	PAGE 7
Community	Flow Characteristic	Calendar Year 2011												Average (MGD)	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Everett	Average Daily Flow	4.68	6.22	6.30	5.64	4.32	4.18	4.06	6.13	5.89	7.21	7.10	6.71	5.70	
	Dry Day Average Daily Flow	4.21	5.25	5.59	4.89	3.99	3.70	3.98	4.88	4.94	5.76	6.15	5.70	4.92	
	Estimated Infiltration	0.71	1.75	2.09	1.39	0.49	0.20	0.48	1.38	1.44	2.26	2.65	2.20	1.42	
	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	0.47	0.97	0.71	0.75	0.33	0.48	0.08	1.25	0.95	1.45	0.95	1.01	0.78	
Lexington	Raw Average Daily Flow	4.73	5.99	12.94	8.07	5.95	5.21	3.81	4.53	5.26	6.53	7.18	7.80	6.50	
	Raw Dry Day Average Daily Flow	4.68	5.20	8.66	7.60	5.54	4.82	3.69	3.95	4.84	5.77	6.70	6.90	5.70	
	Raw Estimated Infiltration	2.28	2.80	6.26	5.20	3.14	2.42	1.29	1.55	2.44	3.37	4.30	4.50	3.30	
	MWRA Estimated Infiltration	0.25	0.31	0.69	0.58	0.35	0.27	0.14	0.17	0.27	0.37	0.48	0.50	0.37	
	Final Average Daily Flow	4.48	5.68	12.25	7.49	5.60	4.94	3.67	4.36	4.99	6.16	6.70	7.30	6.14	
	Final Dry Day Average Daily Flow	4.43	4.89	7.97	7.02	5.19	4.55	3.55	3.78	4.57	5.40	6.22	6.40	5.33	
	Final Estimated Infiltration	2.03	2.49	5.57	4.62	2.79	2.15	1.15	1.38	2.17	3.00	3.82	4.00	2.93	
	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	0.05	0.79	4.28	0.47	0.41	0.39	0.12	0.58	0.42	0.76	0.48	0.90	0.81		
Malden	Raw Average Daily Flow	9.68	12.46	13.73	11.49	9.66	8.97	7.60	9.74	10.10	11.87	10.95	10.93	10.59	
	Raw Dry Day Average Daily Flow	8.61	10.94	12.39	10.65	9.04	8.26	7.55	8.70	9.31	10.19	10.15	9.95	9.63	
	Raw Estimated Infiltration	3.61	5.94	7.39	5.65	4.04	3.26	2.55	3.70	4.31	5.19	5.15	4.95	4.63	
	MWRA Estimated Infiltration	0.39	0.65	0.80	0.62	0.44	0.36	0.28	0.40	0.47	0.57	0.56	0.54	0.51	
	Final Average Daily Flow	9.29	11.81	12.93	10.87	9.22	8.61	7.32	9.34	9.63	11.30	10.39	10.39	10.08	
	Final Dry Day Average Daily Flow	8.22	10.29	11.59	10.03	8.60	7.90	7.27	8.30	8.84	9.62	9.59	9.41	9.13	
	Final Estimated Infiltration	3.22	5.29	6.59	5.03	3.60	2.90	2.27	3.30	3.84	4.62	4.59	4.41	4.13	
	Estimated Sanitary Flow	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
Estimated Inflow	1.07	1.52	1.34	0.84	0.62	0.71	0.05	1.04	0.79	1.68	0.80	0.98	0.95		
Medford	Raw Average Daily Flow	7.43	10.34	12.34	9.79	7.87	6.81	5.67	8.39	8.72	10.22	9.10	9.62	8.85	
	Raw Dry Day Average Daily Flow	6.46	9.17	10.56	8.41	7.29	5.88	5.54	6.85	7.95	9.73	7.84	8.24	7.82	
	Raw Estimated Infiltration	1.96	4.67	6.06	3.91	2.79	1.38	1.04	2.35	3.45	5.23	3.34	3.74	3.32	
	MWRA Estimated Infiltration	0.26	0.62	0.80	0.52	0.37	0.18	0.14	0.31	0.46	0.69	0.44	0.50	0.44	
	Final Average Daily Flow	7.17	9.72	11.54	9.27	7.50	6.63	5.53	8.08	8.26	9.53	8.66	9.12	8.41	
	Final Dry Day Average Daily Flow	6.20	8.55	9.76	7.89	6.92	5.70	5.40	6.54	7.49	9.04	7.40	7.74	7.38	
	Final Estimated Infiltration	1.70	4.05	5.26	3.39	2.42	1.20	0.90	2.04	2.99	4.54	2.90	3.24	2.88	
	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	0.97	1.17	1.78	1.38	0.58	0.93	0.13	1.54	0.77	0.49	1.26	1.38	1.03		
Melrose	Raw Average Daily Flow	4.03	5.89	8.24	6.20	3.93	3.60	3.04	5.60	5.77	7.49	6.72	6.89	5.61	
	Raw Dry Day Average Daily Flow	3.71	5.09	6.71	5.35	3.58	2.97	2.96	4.49	4.86	6.16	6.14	6.06	4.84	
	Raw Estimated Infiltration	1.81	3.19	4.81	3.45	1.68	1.07	1.06	2.59	2.96	4.26	4.24	4.16	2.94	
	MWRA Estimated Infiltration	0.35	0.62	0.94	0.67	0.33	0.21	0.21	0.50	0.58	0.83	0.82	0.81	0.57	
	Final Average Daily Flow	3.68	5.27	7.30	5.53	3.60	3.39	2.83	5.10	5.19	6.66	5.90	6.08	5.04	
	Final Dry Day Average Daily Flow	3.36	4.47	5.77	4.68	3.25	2.76	2.75	3.99	4.28	5.33	5.32	5.25	4.27	
	Final Estimated Infiltration	1.46	2.57	3.87	2.78	1.35	0.86	0.85	2.09	2.38	3.43	3.42	3.35	2.37	
	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	0.32	0.80	1.53	0.85	0.35	0.63	0.08	1.11	0.91	1.33	0.58	0.83	0.78		
Milton (North Only)	Average Daily Flow	0.29	0.41	0.62	0.48	0.34	0.26	0.21	0.21	0.34	0.48	0.48	0.50	0.38	
	Dry Day Average Daily Flow	0.27	0.38	0.49	0.43	0.29	0.24	0.20	0.19	0.29	0.27	0.43	0.45	0.33	
	Estimated Infiltration	0.12	0.23	0.34	0.28	0.14	0.09	0.05	0.04	0.14	0.12	0.28	0.30	0.18	
	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	0.02	0.03	0.13	0.05	0.05	0.02	0.01	0.02	0.05	0.21	0.05	0.05	0.06	

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011													13-Jun-12	PAGE 8	Annual Average (MGD)
Community	Flow Characteristic	Calendar Year 2011													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Newton (North Only)	Average Daily Flow	5.08	6.59	11.42	8.80	6.11	5.05	5.37	5.37	6.89	8.23	8.02	8.46	7.12	
	Dry Day Average Daily Flow	4.91	5.70	9.04	7.78	5.49	4.76	5.03	4.30	6.21	7.35	7.35	7.52	6.29	
	Estimated Infiltration	1.91	2.70	6.04	4.78	2.49	1.76	2.03	1.30	3.21	4.35	4.35	4.52	3.29	
	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	
	Estimated Inflow	0.17	0.89	2.38	1.02	0.62	0.29	0.34	1.07	0.68	0.88	0.67	0.94	0.83	
Reading	Average Daily Flow	2.72	3.22	5.93	4.11	2.98	2.43	2.01	2.72	2.90	4.07	3.89	4.30	3.44	
	Dry Day Average Daily Flow	2.62	2.88	4.28	3.69	2.75	2.23	1.93	2.46	2.63	3.54	3.57	3.87	3.04	
	Estimated Infiltration	1.12	1.38	2.78	2.19	1.25	0.73	0.43	0.96	1.13	2.04	2.07	2.37	1.54	
	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	0.10	0.34	1.65	0.42	0.23	0.20	0.08	0.26	0.27	0.53	0.32	0.43	0.40	
Revere	Average Daily Flow	7.50	9.99	9.66	9.12	7.17	6.36	5.74	8.63	8.33	10.22	9.13	8.83	8.38	
	Dry Day Average Daily Flow	6.59	8.81	8.86	7.38	6.12	5.77	5.67	6.68	7.09	7.39	7.64	7.24	7.09	
	Estimated Infiltration	2.79	5.01	5.06	3.58	2.32	1.97	1.87	2.88	3.29	3.59	3.84	3.44	3.29	
	Estimated Sanitary Flow	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	
	Estimated Inflow	0.91	1.18	0.80	1.74	1.05	0.59	0.07	1.95	1.24	2.83	1.49	1.59	1.29	
Somerville	Raw Average Daily Flow	9.74	15.25	14.44	12.16	8.63	8.41	7.67	12.06	12.43	15.31	12.11	11.47	11.61	
	Raw Dry Day Average Daily Flow	7.96	11.43	11.67	9.88	7.30	6.93	6.87	7.86	8.13	8.94	8.40	7.58	8.56	
	Raw Estimated Infiltration	2.66	6.13	6.37	4.58	2.00	1.63	1.57	2.56	2.83	3.64	3.10	2.28	3.26	
	MWRA Estimated Infiltration	0.18	0.41	0.43	0.31	0.13	0.11	0.11	0.17	0.19	0.25	0.21	0.15	0.22	
	Final Average Daily Flow	9.56	14.84	14.01	11.85	8.50	8.30	7.56	11.89	12.24	15.06	11.90	11.32	11.39	
	Final Dry Day Average Daily Flow	7.78	11.02	11.24	9.57	7.17	6.82	6.76	7.69	7.94	8.69	8.19	7.43	8.34	
	Final Estimated Infiltration	2.48	5.72	5.94	4.27	1.87	1.52	1.46	2.39	2.64	3.39	2.89	2.13	3.04	
	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	1.78	3.82	2.77	2.28	1.33	1.48	0.80	4.20	4.30	6.37	3.71	3.89	3.06	
Stoneham	Raw Average Daily Flow	3.28	4.08	6.69	4.94	3.16	2.65	2.29	4.22	4.30	5.02	5.15	4.95	4.23	
	Raw Dry Day Average Daily Flow	2.96	3.49	5.00	4.51	2.87	2.44	2.19	3.48	3.76	4.31	4.64	4.18	3.65	
	Raw Estimated Infiltration	1.16	1.69	3.20	2.71	1.07	0.64	0.39	1.68	1.96	2.51	2.84	2.38	1.85	
	MWRA Estimated Infiltration	0.22	0.32	0.61	0.52	0.20	0.12	0.07	0.32	0.37	0.48	0.54	0.45	0.35	
	Final Average Daily Flow	3.06	3.76	6.08	4.42	2.96	2.53	2.22	3.90	3.93	4.54	4.61	4.50	3.88	
	Final Dry Day Average Daily Flow	2.74	3.17	4.39	3.99	2.67	2.32	2.12	3.16	3.39	3.83	4.10	3.73	3.30	
	Final Estimated Infiltration	0.94	1.37	2.59	2.19	0.87	0.52	0.32	1.36	1.59	2.03	2.30	1.93	1.50	
	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	0.32	0.59	1.69	0.43	0.29	0.21	0.10	0.74	0.54	0.71	0.51	0.77	0.58	
Wakefield	Raw Average Daily Flow	3.89	5.06	8.56	6.36	4.68	3.67	2.92	5.09	4.90	6.08	5.90	5.74	5.24	
	Raw Dry Day Average Daily Flow	3.64	4.47	6.44	5.75	4.24	3.28	2.87	4.42	4.28	5.27	5.20	4.92	4.57	
	Raw Estimated Infiltration	1.94	2.77	4.74	4.05	2.54	1.58	1.17	2.72	2.58	3.57	3.50	3.22	2.87	
	MWRA Estimated Infiltration	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	
	Final Average Daily Flow	3.88	5.05	8.54	6.34	4.67	3.66	2.91	5.08	4.89	6.06	5.88	5.73	5.23	
	Final Dry Day Average Daily Flow	3.63	4.46	6.42	5.73	4.23	3.27	2.86	4.41	4.27	5.25	5.18	4.91	4.55	
	Final Estimated Infiltration	1.93	2.76	4.72	4.03	2.53	1.57	1.16	2.71	2.57	3.55	3.48	3.21	2.85	
	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	0.25	0.59	2.12	0.61	0.44	0.39	0.05	0.67	0.62	0.81	0.70	0.82	0.67	

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011														Annual Average (MGD)
Community	Flow Characteristic	Calendar Year 2011					13-Jun-12					PAGE 9		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct		Nov	Dec
Waltham	Raw Average Daily Flow	8.60	12.90	19.36	12.75	9.40	8.69	7.48	9.35	9.87	11.58	11.63	11.91	11.12
	Raw Dry Day Average Daily Flow	8.27	11.92	16.44	11.84	8.61	8.08	7.39	8.13	9.09	10.29	10.72	10.56	10.10
	Raw Estimated Infiltration	2.27	5.92	10.44	5.84	2.61	2.08	1.39	2.13	3.09	4.29	4.72	4.56	4.10
	MWRA Estimated Infiltration	0.11	0.28	0.49	0.27	0.12	0.10	0.06	0.10	0.14	0.20	0.22	0.21	0.19
	Final Average Daily Flow	8.49	12.62	18.87	12.48	9.28	8.59	7.42	9.25	9.73	11.38	11.41	11.70	10.93
	Final Dry Day Average Daily Flow	8.16	11.64	15.95	11.57	8.49	7.98	7.33	8.03	8.95	10.09	10.50	10.35	9.91
	Final Estimated Infiltration	2.16	5.64	9.95	5.57	2.49	1.98	1.33	2.03	2.95	4.09	4.50	4.35	3.91
	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	0.33	0.98	2.92	0.91	0.79	0.61	0.09	1.22	0.78	1.29	0.91	1.35	1.02
Watertown	Average Daily Flow	3.51	4.64	5.71	4.54	3.62	3.27	2.72	3.52	3.91	4.96	4.60	4.72	4.14
	Dry Day Average Daily Flow	3.29	4.08	4.78	4.06	3.32	3.09	2.69	2.99	3.51	4.14	4.14	4.11	3.68
	Estimated Infiltration	0.99	1.78	2.48	1.76	1.02	0.79	0.39	0.69	1.21	1.84	1.84	1.81	1.38
	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	0.22	0.56	0.93	0.48	0.30	0.18	0.03	0.53	0.40	0.82	0.46	0.61	0.46
Wilmington	Average Daily Flow	1.40	1.35	1.66	1.49	1.23	1.37	1.23	1.34	1.48	1.45	1.38	1.42	1.40
	Dry Day Average Daily Flow	1.35	1.32	1.49	1.44	1.18	1.30	1.21	1.29	1.35	1.38	1.33	1.33	1.33
	Estimated Infiltration	0.55	0.52	0.69	0.64	0.38	0.50	0.41	0.49	0.55	0.58	0.53	0.53	0.53
	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	0.05	0.03	0.17	0.05	0.05	0.07	0.02	0.05	0.13	0.07	0.05	0.09	0.07
Winchester	Average Daily Flow	2.11	2.87	4.46	3.43	2.43	1.83	1.52	2.20	2.44	3.21	3.27	3.33	2.76
	Dry Day Average Daily Flow	2.00	2.45	3.42	3.13	2.18	1.65	1.50	1.92	2.17	2.82	3.05	2.87	2.43
	Estimated Infiltration	0.90	1.35	2.32	2.03	1.08	0.55	0.40	0.82	1.07	1.72	1.95	1.77	1.33
	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	0.11	0.42	1.04	0.30	0.25	0.18	0.02	0.28	0.27	0.39	0.22	0.46	0.33
Winthrop	Average Daily Flow	2.20	2.69	2.61	2.54	2.28	2.16	1.99	2.25	2.34	2.89	2.62	2.70	2.44
	Dry Day Average Daily Flow	1.97	2.25	2.32	2.17	2.05	1.94	1.93	1.89	2.15	2.17	2.28	2.27	2.11
	Estimated Infiltration	0.97	1.25	1.32	1.17	1.05	0.94	0.93	0.89	1.15	1.17	1.28	1.27	1.11
	Estimated Sanitary Flow	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Estimated Inflow	0.23	0.44	0.29	0.37	0.23	0.22	0.06	0.36	0.19	0.72	0.34	0.43	0.32
Woburn	Raw Average Daily Flow	6.58	8.97	15.81	10.49	7.76	6.75	4.85	6.27	6.68	9.21	9.62	9.84	8.57
	Raw Dry Day Average Daily Flow	6.40	7.88	12.47	9.30	7.34	5.77	4.60	5.37	6.15	8.27	8.87	8.51	7.58
	Raw Estimated Infiltration	1.90	3.38	7.97	4.80	2.84	1.27	0.10	0.87	1.65	3.77	4.37	4.01	3.08
	MWRA Estimated Infiltration	0.27	0.48	1.13	0.68	0.40	0.18	0.01	0.12	0.23	0.54	0.62	0.57	0.44
	Final Average Daily Flow	6.31	8.49	14.68	9.81	7.36	6.57	4.84	6.15	6.45	8.67	9.00	9.27	8.13
	Final Dry Day Average Daily Flow	6.13	7.40	11.34	8.62	6.94	5.59	4.59	5.25	5.92	7.73	8.25	7.94	7.14
	Final Estimated Infiltration	1.63	2.90	6.84	4.12	2.44	1.09	0.09	0.75	1.42	3.23	3.75	3.44	2.64
	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	0.18	1.09	3.34	1.19	0.42	0.98	0.25	0.90	0.53	0.94	0.75	1.33	0.99



**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011														PAGE 10
Community	Flow Characteristic	Calendar Year 2011					13-Jun-12					Annual Average (MGD)		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct		Nov	Dec
Subtotal (Northern System)	Raw Average Daily Flow	198.86	263.14	306.15	267.66	214.27	204.92	174.88	237.37	234.33	280.91	256.22	250.73	240.60
	Raw Dry Day Average Daily Flow	180.50	226.37	257.31	233.27	192.96	177.23	166.26	183.45	198.77	217.43	219.42	210.32	205.08
	Raw Estimated Infiltration	55.95	101.82	132.76	108.72	68.41	52.68	41.71	58.90	74.22	92.88	94.87	85.77	80.53
	MWRA Estimated Infiltration	4.20	8.15	10.16	9.01	5.51	4.48	3.27	4.50	5.62	7.08	7.09	6.53	6.28
	Final Average Daily Flow	194.66	254.99	295.99	258.65	208.76	200.44	171.61	232.87	228.71	273.83	249.13	244.20	234.32
	Final Dry Day Average Daily Flow	176.30	218.22	247.15	224.26	187.45	172.75	162.99	178.95	193.15	210.35	212.33	203.79	198.80
	Final Estimated Infiltration	51.75	93.67	122.60	99.71	62.90	48.20	38.44	54.40	68.60	85.80	87.78	79.24	74.25
	Estimated Sanitary Flow	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55
	Estimated Inflow	18.36	36.77	48.84	34.39	21.31	27.69	8.62	53.92	35.56	63.48	36.80	40.41	35.52
Total (North and South)	Raw Average Daily Flow	303.23	407.55	487.52	408.56	330.77	304.06	251.42	335.48	354.46	443.54	406.89	402.23	369.34
	Raw Dry Day Average Daily Flow	278.54	351.43	408.36	359.41	298.79	269.47	239.26	268.26	307.10	348.91	352.89	340.91	318.30
	Raw Estimated Infiltration	101.24	174.13	231.06	182.11	121.49	92.17	62.06	90.96	129.80	171.61	175.59	163.61	141.01
	MWRA Estimated Infiltration	10.13	18.26	21.44	18.15	12.46	9.92	5.76	8.95	14.31	17.87	16.94	16.45	14.18
	Final Average Daily Flow	293.10	389.29	466.08	390.41	318.31	294.14	245.66	326.53	340.15	425.67	389.95	385.78	355.16
	Final Dry Day Average Daily Flow	268.41	333.17	386.92	341.26	286.33	259.55	233.50	259.31	292.79	331.04	335.95	324.46	304.12
	Final Estimated Infiltration	91.11	155.87	209.62	163.96	109.03	82.25	56.30	82.01	115.49	153.74	158.65	147.16	126.83
	Estimated Sanitary Flow	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.29
	Estimated Inflow	24.69	56.12	79.16	49.15	31.98	34.59	12.16	67.22	47.36	94.63	54.00	61.32	51.04
North System as Reported by NPDES	Average Daily Flow	204.50	266.20	306.00	271.00	218.70	207.80	175.80	238.00	232.00	277.70	249.40	247.10	240.99
Total System as Reported by NPDES	Average Daily Flow	314.80	417.30	497.30	419.50	339.70	313.10	260.00	342.90	355.70	448.40	409.70	404.30	376.59

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011														Annual Average (MGD)	
Community	Flow Characteristic	Calendar Year 2011		0.00			0.00			13-Jun-12			PAGE 11		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Chelsea Creek	Average Daily Flow	89.65	119.05	158.25	126.89	96.40	91.06	72.38	107.33	104.91	132.00	119.67	122.12	111.59	
	Dry Day Average Daily Flow	82.53	100.40	126.74	108.19	84.81	75.43	69.10	81.84	89.28	99.97	102.69	103.16	93.62	
	Estimated Infiltration	33.63	51.50	77.84	59.29	35.91	26.53	20.20	32.94	40.38	51.07	53.79	54.26	44.72	
	Estimated Sanitary Flow	48.90	48.90	48.90	48.90	48.90	48.90	48.90	48.90	48.90	48.90	48.90	48.90	48.90	48.90
	Estimated Inflow	7.12	18.65	31.51	18.70	11.59	15.63	3.28	25.49	15.63	32.03	16.98	18.96	17.97	
Columbus Park	Average Daily Flow	32.27	42.68	38.10	37.99	33.09	34.58	29.79	44.60	40.26	48.23	42.00	37.69	38.40	
	Dry Day Average Daily Flow	27.38	34.20	33.72	30.02	29.33	26.84	27.66	31.44	32.11	31.97	32.51	27.94	30.40	
	Estimated Infiltration	7.23	14.05	13.57	9.87	9.18	6.69	7.51	11.29	11.96	11.82	12.36	7.79	10.25	
	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	
	Estimated Inflow	4.89	8.48	4.38	7.97	3.76	7.74	2.13	13.16	8.15	16.26	9.49	9.75	8.01	
Ward Street	Average Daily Flow	65.69	80.93	91.29	90.04	75.33	73.21	64.96	76.57	76.84	88.15	80.00	78.18	78.39	
	Dry Day Average Daily Flow	62.34	73.33	80.86	83.54	69.81	67.75	60.75	61.60	67.96	73.20	72.08	69.54	70.18	
	Estimated Infiltration	16.74	27.73	35.26	37.94	24.21	22.15	15.15	16.00	22.36	27.60	26.48	23.94	24.58	
	Estimated Sanitary Flow	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	
	Estimated Inflow	3.35	7.60	10.43	6.50	5.52	5.46	4.21	14.97	8.88	14.95	7.92	8.64	8.22	
Winthrop Terminal	Average Daily Flow	30.14	31.19	22.04	21.44	19.83	17.06	15.18	20.82	20.66	22.70	20.36	18.87	21.63	
	Dry Day Average Daily Flow	28.44	24.87	19.85	18.82	16.22	14.12	14.90	17.25	19.13	17.23	17.62	14.58	18.55	
	Estimated Infiltration	18.54	14.97	9.95	8.92	6.32	4.22	5.00	7.35	9.23	7.33	7.72	4.68	8.65	
	Estimated Sanitary Flow	9.90	9.90	9.90	9.90	9.90	9.90	9.90	9.90	9.90	9.90	9.90	9.90	9.90	
	Estimated Inflow	1.70	6.32	2.19	2.62	3.61	2.94	0.28	3.57	1.53	5.47	2.74	4.29	3.09	
Subtotal - Northern Headworks	Average Daily Flow	217.75	273.85	309.68	276.36	224.65	215.91	182.31	249.32	242.67	291.08	262.03	256.86	250.02	
	Dry Day Average Daily Flow	200.69	232.80	261.17	240.57	200.17	184.14	172.41	192.13	208.48	222.37	224.90	215.22	212.74	
	Estimated Infiltration	76.14	108.25	136.62	116.02	75.62	59.59	47.86	67.58	83.93	97.82	100.35	90.67	88.19	
	Estimated Sanitary Flow	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	124.55	
	Estimated Inflow	17.06	41.05	48.51	35.79	24.48	31.77	9.90	57.19	34.19	68.71	37.13	41.64	37.28	
Headworks as Reported by NPDES	SUM of ADF's	204.50	266.20	306.00	271.00	218.70	207.80	175.80	238.00	232.00	277.70	249.40	247.10	240.99	
Chelsea Creek	Average Daily Flow	92.40	123.20	159.70	126.60	96.20	91.20	72.10	107.80	105.40	132.00	119.40	121.90	112.25	
Columbus Park	Average Daily Flow	27.00	35.40	32.30	31.50	26.90	28.10	25.10	37.40	34.40	39.60	34.80	29.80	31.83	
Ward Street	Average Daily Flow	66.70	83.80	93.40	93.20	78.40	71.80	63.30	71.90	72.70	84.00	75.80	78.10	77.70	
Winthrop Terminal	Average Daily Flow	18.40	23.80	20.60	19.70	17.20	16.70	15.30	20.90	19.50	22.10	19.40	17.30	19.21	
Total System Flow  (Southern Collection System Plus Northern Headworks)	Raw Average Daily Flow	322.12	418.26	491.05	417.26	341.15	315.05	258.85	347.43	362.80	453.71	412.70	408.36	378.76	
	Raw Dry Day Average Daily Flow	298.73	357.86	412.22	366.71	306.00	276.38	245.41	276.94	316.81	353.85	358.37	345.81	325.96	
	Raw Estimated Infiltration	121.43	180.56	234.92	189.41	128.70	99.08	68.21	99.64	139.51	176.55	181.07	168.51	148.67	
	MWRA Estimated Infiltration	5.93	10.11	11.28	9.14	6.95	5.44	2.49	4.45	8.69	10.79	9.85	9.92	7.90	
	Final Average Daily Flow	316.19	408.15	479.77	408.12	334.20	309.61	256.36	342.98	354.11	442.92	402.85	398.44	370.86	
	Final Dry Day Average Daily Flow	292.80	347.75	400.94	357.57	299.05	270.94	242.92	272.49	308.12	343.06	348.52	335.89	318.06	
	Final Estimated Infiltration	115.50	170.45	223.64	180.27	121.75	93.64	65.72	95.19	130.82	165.76	171.22	158.59	140.77	
	Estimated Sanitary Flow	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.30	177.29	
	Estimated Inflow	23.39	60.40	78.83	50.55	35.15	38.67	13.44	70.49	45.99	99.86	54.33	62.55	52.80	

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011														Annual Average (MGD)	
Community	Flow Characteristic	Calendar Year 2011			0.00			0.00			13-Jun-12				PAGE 12
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Boston (Total)	Raw Average Daily Flow	96.75	127.14	122.25	122.96	106.43	104.41	85.54	116.37	117.03	139.11	120.66	117.46	114.56	
	Raw Dry Day Average Daily Flow	86.21	110.85	108.56	108.46	94.84	89.87	79.32	87.38	100.71	104.06	102.73	97.77	97.42	
	Raw Estimated Infiltration	28.21	52.85	50.56	50.46	36.84	31.87	21.32	29.38	42.71	46.06	44.73	39.77	39.42	
	MWRA Estimated Infiltration	6.39	11.52	11.68	11.16	8.05	6.93	3.51	5.55	9.83	11.39	10.44	10.31	8.87	
	Final Average Daily Flow	90.36	115.62	110.57	111.80	98.38	97.48	82.03	110.82	107.20	127.72	110.22	107.15	105.69	
	Final Dry Day Average Daily Flow	79.82	99.33	96.88	97.30	86.79	82.94	75.81	81.83	90.88	92.67	92.29	87.46	88.56	
	Final Estimated Infiltration	21.82	41.33	38.88	39.30	28.79	24.94	17.81	23.83	32.88	34.67	34.29	29.46	30.56	
	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	
Estimated Inflow	10.54	16.29	13.69	14.50	11.59	14.54	6.22	28.99	16.32	35.05	17.93	19.69	17.13		
Brookline (Total)	Average Daily Flow	8.84	12.43	14.47	11.41	9.93	9.06	7.32	10.11	10.50	14.24	12.07	11.73	11.00	
	Dry Day Average Daily Flow	8.28	10.40	11.89	10.21	9.13	8.32	7.17	7.84	9.07	11.23	10.23	9.82	9.46	
	Estimated Infiltration	3.78	5.90	7.39	5.71	4.63	3.82	2.67	3.34	4.57	6.73	5.73	5.32	4.96	
	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	0.56	2.03	2.58	1.20	0.80	0.74	0.15	2.27	1.43	3.01	1.84	1.91	1.54	
Milton (Total)	Average Daily Flow	3.17	5.00	6.38	4.74	3.60	2.81	2.04	2.58	3.24	5.64	5.35	5.01	4.12	
	Dry Day Average Daily Flow	2.91	4.11	5.26	4.01	3.10	2.54	1.97	2.52	2.85	4.05	4.52	4.18	3.50	
	Estimated Infiltration	1.51	2.71	3.86	2.61	1.70	1.14	0.57	1.12	1.45	2.65	3.12	2.78	2.10	
	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	0.26	0.89	1.12	0.73	0.50	0.27	0.07	0.06	0.39	1.59	0.83	0.83	0.63	
Newton (Total)	Average Daily Flow	14.24	20.48	30.64	21.92	16.18	13.45	10.09	14.76	18.34	24.55	24.01	24.02	19.38	
	Dry Day Average Daily Flow	13.76	16.77	24.29	19.82	14.64	12.62	9.06	11.84	15.92	20.62	21.31	21.02	16.80	
	Estimated Infiltration	6.76	9.77	17.29	12.82	7.64	5.62	2.06	4.84	8.92	13.62	14.31	14.02	9.80	
	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	0.48	3.71	6.35	2.10	1.54	0.83	1.03	2.92	2.42	3.93	2.70	3.00	2.58	

**TABLE 4 - ESTIMATED COMMUNITY WASTEWATER FLOW COMPONENTS FOR CY11**

Table 4 - Estimated Community Wastewater Flow Components for 2011														Annual Average (MGD)
Community	Flow Characteristic	Calendar Year 2011					13-Jun-12					PAGE 13		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Subtotal	Raw Average Daily Flow	104.32	138.33	129.39	133.56	112.78	114.68	98.27	134.36	125.48	146.45	127.04	119.70	123.56
Northern System CSO	Raw Dry Day Average Daily Flow	92.42	116.49	114.07	113.26	99.65	95.50	91.58	96.38	101.08	102.36	102.85	95.97	101.67
Communities Only:	Raw Estimated Infiltration	23.32	47.39	44.97	44.16	30.55	26.40	22.48	27.28	31.98	33.26	33.75	26.87	32.57
	MWRA Estimated Infiltration	2.28	4.76	4.50	5.00	3.23	3.00	2.33	2.50	3.02	3.25	3.25	2.82	3.31
[Sum of Boston (North), Cambridge, Chelsea, and Somerville]	Final Average Daily Flow	102.04	133.57	124.89	128.56	109.55	111.68	95.94	131.86	122.46	143.20	123.79	116.88	120.25
	Final Dry Day Average Daily Flow	90.14	111.73	109.57	108.26	96.42	92.50	89.25	93.88	98.06	99.11	99.60	93.15	98.35
	Final Estimated Infiltration	21.04	42.63	40.47	39.16	27.32	23.40	20.15	24.78	28.96	30.01	30.50	24.05	29.25
	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	11.90	21.84	15.32	20.30	13.13	19.18	6.69	37.98	24.40	44.09	24.19	23.73	21.89
Subtotal	Raw Average Daily Flow	94.54	124.81	176.76	134.10	101.49	90.24	76.61	103.01	108.85	134.46	129.18	131.03	117.04
Northern System Without	Raw Dry Day Average Daily Flow	88.08	109.88	143.24	120.01	93.31	81.73	74.68	87.07	97.69	115.07	116.57	114.35	103.41
North CSO Communities:	Raw Estimated Infiltration	32.63	54.43	87.79	64.56	37.86	26.28	19.23	31.62	42.24	59.62	61.12	58.90	47.96
	MWRA Estimated Infiltration	1.92	3.39	5.66	4.01	2.28	1.48	0.94	2.00	2.60	3.83	3.84	3.71	2.97
	Final Average Daily Flow	92.62	121.42	171.10	130.09	99.21	88.76	75.67	101.01	106.25	130.63	125.34	127.32	114.07
	Final Dry Day Average Daily Flow	86.16	106.49	137.58	116.00	91.03	80.25	73.74	85.07	95.09	111.24	112.73	110.64	100.45
	Final Estimated Infiltration	30.71	51.04	82.13	60.55	35.58	24.80	18.29	29.62	39.64	55.79	57.28	55.19	45.00
	Estimated Sanitary Flow	55.45	55.45	55.45	55.45	55.45	55.45	55.45	55.45	55.45	55.45	55.45	55.45	55.45
	Estimated Inflow	6.46	14.93	33.52	14.09	8.18	8.51	1.93	15.94	11.16	19.39	12.61	16.68	13.63
Subtotal	Raw Average Daily Flow	198.91	269.22	358.13	275.00	217.99	189.38	153.15	201.12	228.98	297.09	279.85	282.53	245.78
North/South Systems Without	Raw Dry Day Average Daily Flow	186.12	234.94	294.29	246.15	199.14	173.97	147.68	171.88	206.02	246.55	250.04	244.94	216.64
North CSO Communitcs:	Raw Estimated Infiltration	77.92	126.74	186.09	137.95	90.94	65.77	39.58	63.68	97.82	138.35	141.84	136.74	108.44
	MWRA Estimated Infiltration	7.85	13.50	16.94	13.15	9.23	6.92	3.43	6.45	11.29	14.62	13.69	13.63	10.87
	Final Average Daily Flow	191.06	255.72	341.19	261.85	208.76	182.46	149.72	194.67	217.69	282.47	266.16	268.90	234.92
	Final Dry Day Average Daily Flow	178.27	221.44	277.35	233.00	189.91	167.05	144.25	165.43	194.73	231.93	236.35	231.31	205.77
	Final Estimated Infiltration	70.07	113.24	169.15	124.80	81.71	58.85	36.15	57.23	86.53	123.73	128.15	123.11	97.58
	Estimated Sanitary Flow	108.20	108.20	108.20	108.20	108.20	108.20	108.20	108.20	108.20	108.20	108.20	108.20	108.19
	Estimated Inflow	12.79	34.28	63.84	28.85	18.85	15.41	5.47	29.24	22.96	50.54	29.81	37.59	29.15