



MASSACHUSETTS WATER RESOURCES AUTHORITY

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Ms. Susan Studlien
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US EPA, Region 1
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Boston, MA 02109-3912

August 26, 2015

Mr. David Ferris
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 2015**

Dear Ms. Studlien and Mr. Ferris:

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 2015.

- Attachment 1 – Overview of MWRA Regional I/I Reduction Plan
- Attachment 2 – MWRA Regional I/I Reduction Plan – FY15 Progress Update and Detailed Implementation Schedule for FY16 Activities
- Attachment 3 – MWRA Actions Taken to Reduce I/I During FY15
- 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 – CY14 Community Wastewater Flow Data

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

Sincerely,

Michael J. Hornbrook
Chief Operating Officer

cc: MassDEP - Regulatory Branch, Boston Betsy Reilley, MWRA, Director, Environmental Quality
MassDEP - SERO Wendy Leo, MWRA, NPDES Coordinator
MassDEP - NERO Carl H. Leone, MWRA, Community Support Program
Kevin Brander, MassDEP, NERO
Nihar Mohanty, MassDEP, NERO

ATTACHMENT 1
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY15
Reporting Period – July 2014 Through June 2015

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 FY15
Reporting Period – July 2014 Through June 2015

**MWRA REGIONAL I/I REDUCTION PLAN -
FY15 PROGRESS UPDATE AND DETAILED
IMPLEMENTATION SCHEDULE FOR FY16 ACTIVITIES**

This document provides a progress update for FY15 accomplishments and a description of the activities to be accomplished during FY16 for each of the I/I reduction strategies in the MWRA Regional I/I Reduction Plan. The update appears in bold type directly below each I/I reduction strategy. This document is intended to satisfy condition 5 of DEP's November 19, 2002 letter approving the MWRA Regional I/I Reduction Plan.

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

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

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

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

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

Work by MWRA under these three Strategies is ongoing.

During FY15, 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 FY15 are detailed in Attachment 3. Additional information on MWRA's FY15 maintenance activities is provided under separate submittal - NPDES Part I.18.g Annual Maintenance Status Sheets.

During FY16, MWRA will continue to properly operate and maintain the MWRA-owned interceptor system.

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

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

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

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

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

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

In May 2005, MassDEP developed a revised Reporting Form "Sanitary Sewer Overflow/Bypass/Backup Notification Form (rev 05/2005)." This form was made available on the MassDEP web site and reporting was via FAX or by mail. Following development of the web based reporting form by MassDEP, roll-out of the SSO reporting/record keeping electronic database was delayed. In January 2013, MassDEP developed the most recent revised Reporting Form "Sanitary Sewer Overflow (SSO)/Bypass Notification Form (rev 01/2013)." As of July 2014, this form is available on the MassDEP web site and reporting using the form is via FAX or by mail. As of July 2014, an SSO reporting/record keeping electronic database is not included among the searchable databases available on the MassDEP web site.

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

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

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

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

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

During FY15, 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 FY16.

In FY12, MWRA began implementing the North System Hydraulic Study which may further evaluate potential improvements to the MWRA-owned collection system that may reduce the risk of sewer backups and SSOs. The consultant scope of services was completed in FY15.

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

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

As part of its ongoing program to support member community I/I reduction and sewer system rehabilitation programs, MWRA offers technical assistance to communities to review local I/I reduction plans and regional SSO problems. During FY16, 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 stated, MWRA does not have SSOs related to dry weather sewer system capacity issues. MWRA also does not have SSOs related to wet weather sewer capacity issues for rainfall events at or below the MassDEP recommended design storm having a one year recurrence interval and a duration of six hours (see MassDEP’s Guidelines for Performing I/I Analyses and Sewer System Evaluation Surveys – Revised January 1993). Since prior SSOs have been eliminated for sewer capacity issues at or below the collection system design standard, additional work under this strategy is not necessary.

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

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

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

During FY14 (as of April 25, 2014), MassDEP revised its Regulation 314 CMR 12.00 Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers. The revisions included a requirement for all public entities that own a sewer system to complete an I/I analysis by December 31, 2017. The analysis also must specifically include an assessment of the risk of sewer system overflows.

During FY15, 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. 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 FY15, MWRA continued work on projects in the MWRA Capital Improvement Program, as summarized in Attachment 3.

During FY16, at the request of member communities, MWRA will continue to provide technical and financial assistance to member sewer communities.

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

Work by MWRA under this Strategy is ongoing.

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

During FY15, 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 FY16.

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 FY15 Capital Improvement Program, an additional \$160 million in 75% grants and 25% interest-free loans was added as Phases 9 and 10 (\$80 million for each Phase) of the I/I Local Financial Assistance Program to help fund community I/I reduction**

projects. Note that MWRA has enhanced the Phase 9 and 10 Phases of its grant/loan community funding program by increasing the grant portion from 45% to 75%. MWRA's commitment to fund local sewer rehabilitation projects under the I/I Local Financial Assistance Program totals \$460.75 million. Through FY15, \$288 million in grants and interest-free loans has been distributed to member sewer communities.

- Ongoing CSO projects in Cambridge 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, MWRA began implementing the North System Hydraulic Study which may further evaluate potential improvements to the MWRA-owned collection system that may reduce the risk of sewer backups and SSOs. The consultant scope of services was completed in FY15.
- MWRA's Capital Improvement Plan includes a long-term Randolph Extension Sewer Relief Study to identify and evaluate potential system improvements.

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

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

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

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

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

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

Work by MWRA under this Strategy is ongoing.

During FY15, MWRA continued to estimate community infiltration and inflow rates on a bimonthly basis. Community wastewater flow data for CY14 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. \$22.6 million in funds for the next phases of the wastewater meter replacement/upgrade project are programmed in MWRA's Capital Improvement Program during FY16-28.

During FY16, MWRA will continue to estimate community infiltration and inflow rates on a bimonthly basis and make this information available to MWRA member communities. MWRA will provide the information to EPA and MassDEP as part of the annual summary report on actions taken to reduce I/I (submitted annually by September 1 per the NPDES Permit).

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

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

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

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

Work by MWRA under this Strategy is ongoing.

During FY14 (as of April 25, 2014), MassDEP revised its Regulation 314 CMR 12.00 Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers. The revisions included a requirement for all public entities that own a sewer system to complete an I/I analysis by December 31, 2017. The analysis also must specifically include an assessment of the risk of sewer system overflows.

During FY15, 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 SSES studies. Communities also often discuss what sewer system rehabilitation actions other communities are pursuing. MWRA's Advisory Board Operation Committee meetings are regularly used as a platform for member communities to share information on projects and lessons learned. All member sewer communities are actively participating in MWRA's \$460.75 million 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 FY16.

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

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

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

During FY14 and continuing in FY15, MWRA updated prior (or developed new) GIS mapping information partnership agreements with most MWRA member water and sewer communities to share MWRA/community GIS mapping data. Under the partnership agreements, MWRA and the member communities have agreed signed nondisclosure agreements that detail security protocols necessary to safeguard the water and sewer system data. MWRA continues to coordinate with member communities to add GIS partners and update existing data. This work will continue in FY16.

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

Work by MWRA under this Strategy is ongoing.

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

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

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

In June 2012, the MWRA Board of Directors approved an additional \$40 million (\$18 million in grants and \$22 million in interest-free loans) to increase the total I/I Local Financial Assistance Program budget to \$300.75 million and extended program distributions through FY21. The additional \$40 million (Phase 8) in financial assistance funds became available to the communities in FY13.

In June 2014, the MWRA Board of Directors approved an additional \$160 million (\$120 million in 75% grants and \$40 million in 25% interest-free 10-year loans) to increase the total I/I Local Financial Assistance Program budget to \$460.75 million and extended program distributions through FY25. The additional \$160 million (\$80 million each for Phases 9 and 10) in financial assistance funds became available to the communities in FY15. Note that MWRA has enhanced the Phase 9 and 10 Phases of its grant/loan community funding program by increasing the grant portion from 45% to 75%. Also, the loan portion repayment period has been extended from 5 to 10 years. As of FY15, MWRA's commitment to fund local sewer rehabilitation projects under the I/I Local Financial Assistance Program totals \$460.75 million.

During FY15, 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 \$26.63 million was distributed during FY15. Since program inception in May 1993, \$288 million has been distributed to fund 481 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 FY16, 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 FY25.

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

Work by MWRA under this Strategy is ongoing.

During FY15, MWRA continued to provide emergency assistance to member communities, as requested. These efforts typically included internal TV inspection of local sewers and associated sewer cleaning, as well as, other emergency assistance. During FY16, MWRA will continue to provide emergency assistance to member communities.

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

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

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

Work by MWRA under this Strategy is ongoing.

During FY15, MWRA distributed technical information to member community Public Works Directors, local wastewater/water system operators, and local watershed groups, including:

- **MWRA continued to estimate community infiltration and inflow rates on a bimonthly basis. Community wastewater flow data for CY14 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. \$22.6 million in funds for the next phase of wastewater meter replacement/upgrade project are programmed in MWRA's Capital Improvement Program during FY16-28.**
- **February 25, 2015 MWRA staff distributed an 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.**
- **March 9, 2015 I/I Local Financial Program update letters were distributed to each member community.**
- **March 12, 2015 Local Pipeline and Water System Assistance Program funding (interest-free 10-year loans) update letters were distributed for local projects.**
- **March 17, 2015 update e-mail was distributed to all member communities noting MWRA's new 3-year community task-order leak detection contracts.**

- **May 21, 2015 MWRA staff provided an update presentation on the I/I Local Financial Assistance Program (as well as the Local Water System Assistance Program) to the MWRA Advisory Board and local community representatives and discussed the grant/loan enhancements under Phases 9 and 10.**
- **June 2015 annual community I/I questionnaire were distributed to member communities to acquire information on FY15 local I/I reduction programs for development of MWRA's Annual I/I Reduction Report (see Attachment 5).**

During FY16, MWRA will continue to distribute information on I/I and SSO issues, as appropriate.

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

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

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

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

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

On April 27, 2011, representatives from MassDEP, EPA, and MWRA met to discuss I/I reduction in the region. The potential for future workshops was noted, but no specific plans have been developed for organizing additional joint workshops.

During FY14 (as of April 25, 2014), MassDEP revised its Regulation 314 CMR 12.00 Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers. The revisions included a requirement for all public entities that own a sewer system to complete an I/I analysis by December 31, 2017. The

analysis also must specifically include an assessment of the risk of sewer system overflows.

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

Periodically, MWRA staff provided update presentations to the MWRA Advisory Board and member community representatives, as well as the Wastewater Advisory Committee and Water Supply Citizens Advisory Committee, on a variety of related topics including: I/I Local Financial Assistance Program, Local Water System Assistance Program, water and wastewater metering, water and wastewater flow data, rate assessment methodologies, water and wastewater permitting and regulations, etc. See the list of technical information noted in Strategy A, above.

During FY16, MWRA will continue to work cooperatively with MassDEP on this strategy.

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

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

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

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

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

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

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

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

Local communities, state agencies, regional associations, etc. all maintain their own web pages with numerous information links. MWRA’s web site contains links to the communities’ web sites and links to other organizations. Based on current broad use of the web, additional work under this strategy is not needed. During FY15, MWRA continued to revise and upgraded its web site www.mwra.com and the Community Support Program: <http://www.mwra.com/comsupport/communitysupportmain.html>.

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

Work by MWRA under this Strategy is ongoing.

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

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

Work by MWRA under this Strategy is ongoing. During FY15, no assistance from MWRA was requested by MassDEP. Any future action under this strategy will be initiated jointly with MassDEP.

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

Work by MWRA under this Strategy is ongoing. During FY15, no assistance from MWRA was requested under this strategy.

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

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

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

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

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

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

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

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

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

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

A Member Community Collection System Operation and Maintenance Manual Guidance Document and Overflow Response Plan was developed and submitted to EPA and MassDEP for review in June 2001. This guidance document was made available to member communities. During FY04, MassDEP distributed a new guideline document – “Optimizing Operation, Maintenance and Rehabilitation of Sanitary Sewer Collection Systems” dated August 2003. This manual was developed by New England Interstate Water Pollution Control Commission (NEIWPCC) under a grant from EPA. It was written by a committee consisting of NEIWPCC member state environmental agencies, EPA, and wastewater consultants. The manual is available at www.neiwpcc.org. 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.

During FY14 (as of April 25, 2014), MassDEP revised its Regulation 314 CMR 12.00 Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers.

ATTACHMENT 3
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY15
Reporting Period – July 2014 Through June 2015

MWRA ACTIONS TAKEN TO REDUCE I/I DURING FY15

The MWRA Field Operations Department's Technical Inspection program staff have internally inspected approximately 29 miles of Authority-owned interceptors and 3.7 miles of community-owned sewers, internally inspected 52 inverted siphon barrels with sonar inspection equipment, and physically inspected over 1070 sewer manholes and other structures (diversion chambers, siphon headhouses, tide gates, etc.) during FY15. 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 FY15, MWRA's maintenance work included hydraulic/mechanical cleaning of 21.7 miles of Authority-owned sewers, cleaning of 57 siphon barrels, and replacement of 25 manhole frames and covers. In addition, 55 sewer manholes were rehabilitated via cement mortar lining under MWRA's annual manhole rehabilitation contract during FY14/15. 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 FY15, MWRA continued rehabilitation of sewer interceptors under the Interceptor Renewal/Asset Protection Program. Evaluation and design of interceptor rehabilitation began in FY09. The program includes a series of twelve interceptor renewal projects to be phased over multiple years at a cost of \$80 to \$100 million. Each of these projects will provide structural repairs for existing pipelines and reduce I/I entering the MWRA interceptor system. MWRA's Interceptor Renewal/Asset Protection Projects #1 through #7 for rehabilitation construction of a variety of Sewer Sections are programmed in the FY16 CIP at a cost of about \$45 million in FY15-30.
2. Sewer asset protection rehabilitation construction of Section 186 and a small portion of Section 4 on Deer Island, just upstream of the DITP, are programmed in the FY15 CIP at a cost of \$3.75 million in FY19-20. 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 FY16 CIP at a cost of \$14.4 million in FY19-24. The project will include rehabilitation of about 3,300 feet of 108-inch brick sewer that was previously rehabilitated using a shotcrete process in the 1990s.

4. 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 FY16 CIP at a cost of \$2.91 million in FY19-22. Rehabilitation and/or replacement of hydrogen sulfide metering in the sewers is included in this project. In addition, design and construction for rehabilitation of the Framingham Extension Sewer/Framingham Extension Relief Sewer (FES/FERS) Tunnel is programmed in the FY16 CIP at a cost of \$8.5 million in FY19-22. A System-wide Corrosion and Odor Control Study to evaluate needs and identify solutions for hydrogen sulfide corrosion and odor problems is programmed in the FY16 CIP at a cost of \$1.0 million in FY19-21.
5. 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 FY16 CIP at a cost of \$571,000 through FY16. 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 FY16 CIP at a cost of \$7.44 million during FY17-25. 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.
6. 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 FY16 CIP at a cost of \$6.63 million during FY19-23. This project will include hydraulic capacity review, structural repairs of deteriorated conditions, stop plank construction, installation of new covers and/or appropriate access to 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.
7. MWRA's \$898 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 FY15, approximately \$875 million has been expended on MWRA's CSO Control Plan with additional projects scheduled for FY16-20.

ATTACHMENT 4
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY15
Reporting Period – July 2014 Through June 2015

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

Financial Assistance Update

All 43 member sewer communities are participating in MWRA’s \$460.75 million Infiltration/Inflow (I/I) Local Financial Assistance (grant/loan) Program. The program began in May 1993 and, through FY15, \$288 million has been distributed to fund local I/I reduction and sewer system rehabilitation projects. The program budget of \$460.75 million includes the most recent addition of \$160 million in new Phase 9 (\$80 million) and Phase 10 (\$80 million) funds approved by the MWRA Board of Directors for distribution beginning in FY15. In addition, the grant component and loan repayment terms have been enhanced for the additional Phase 9 and 10 funds. The table on page 2 provides a summary of funding allocations, distributions, and funds remaining for each MWRA sewer community. Distribution of grant and loan financial assistance to member communities has been approved through FY25. The table on page 3 provides a summary of funding distributions by fiscal quarter since Program inception.

Program Background

MWRA’s I/I Local Financial Assistance Program was initiated to provide funding to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Following recommendations from the MWRA Advisory Board, the MWRA Board of Directors has approved a total program budget of \$460.75 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 for program Phases 1 through 8 has been repaid to MWRA over a five-year period beginning one year after the date the funds are distributed. The grant/loan split was again revised for distribution of Phases 9 and 10 funds (total of \$160 million) to a 75 percent grant and a 25 percent interest-free loan. The interest-free loan repayment period for Phase 9 and 10 has been extended to ten years from the previous five (again 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.

**MWRA I/ LOCAL FINANCIAL ASSISTANCE PROGRAM
FUNDING SUMMARY AS OF JULY 2015**

Community	Total Allocations (Phases 1 - 10)	Total Distributions (Phases 1 - 10)	Percent Distributed	Funds Remaining
Arlington	\$8,423,000	\$6,413,000	76%	\$2,010,000
Ashland	\$2,168,500	\$1,328,500	61%	\$840,000
Bedford	\$3,404,600	\$1,691,600	50%	\$1,713,000
Belmont	\$5,135,100	\$2,992,100	58%	\$2,143,000
Boston	\$132,171,200	\$83,711,976	63%	\$48,459,224
Braintree	\$8,359,000	\$5,175,800	62%	\$3,183,200
Brookline	\$13,165,200	\$7,666,200	58%	\$5,499,000
Burlington	\$5,102,800	\$3,285,800	64%	\$1,817,000
Cambridge	\$23,620,100	\$11,077,055	47%	\$12,543,045
Canton	\$3,965,900	\$2,675,900	67%	\$1,290,000
Chelsea	\$6,870,100	\$4,232,100	62%	\$2,638,000
Dedham	\$5,740,000	\$4,827,000	84%	\$913,000
Everett	\$8,071,500	\$3,141,500	39%	\$4,930,000
Framingham	\$12,125,000	\$5,874,650	48%	\$6,250,350
Hingham	\$1,632,500	\$1,332,500	82%	\$300,000
Holbrook	\$1,639,600	\$896,562	55%	\$743,038
Lexington	\$7,445,300	\$6,140,300	82%	\$1,305,000
Malden	\$12,283,900	\$4,593,900	37%	\$7,690,000
Medford	\$11,987,600	\$4,794,600	40%	\$7,193,000
Melrose	\$6,076,300	\$3,914,300	64%	\$2,162,000
Milton	\$5,564,500	\$3,251,500	58%	\$2,313,000
Natick	\$5,582,600	\$4,452,800	80%	\$1,129,800
Needham	\$6,257,600	\$2,892,150	46%	\$3,365,450
Newton	\$21,197,400	\$17,529,400	83%	\$3,668,000
Norwood	\$6,879,400	\$4,233,499	62%	\$2,645,901
Quincy	\$19,790,000	\$12,882,000	65%	\$6,908,000
Randolph	\$6,050,800	\$3,894,800	64%	\$2,156,000
Reading	\$4,629,100	\$2,870,100	62%	\$1,759,000
Revere	\$10,130,900	\$5,502,900	54%	\$4,628,000
Somerville	\$15,515,800	\$10,117,800	65%	\$5,398,000
Stoneham	\$4,919,900	\$4,105,900	83%	\$814,000
Stoughton	\$4,722,900	\$3,671,200	78%	\$1,051,700
Wakefield	\$5,966,900	\$3,810,800	64%	\$2,156,100
Walpole	\$3,680,000	\$3,042,000	83%	\$638,000
Waltham	\$13,732,400	\$11,377,400	83%	\$2,355,000
Watertown	\$6,285,800	\$2,581,800	41%	\$3,704,000
Wellesley	\$5,709,700	\$2,748,808	48%	\$2,960,892
Westwood	\$2,532,300	\$1,425,300	56%	\$1,107,000
Weymouth	\$11,480,900	\$6,321,300	55%	\$5,159,600
Wilmington	\$2,462,000	\$1,388,000	56%	\$1,074,000
Winchester	\$4,183,000	\$3,448,000	82%	\$735,000
Winthrop	\$3,393,400	\$1,926,400	57%	\$1,467,000
Woburn	\$10,695,500	\$8,694,200	81%	\$2,001,300
Totals	\$460,750,000	\$287,933,400	62%	\$172,816,600

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

FY	Distribution Cycle	Distribution Amount	FY Total						
FY93	Aug 1992	\$0	Nov 1992	\$0	Feb 1993	\$0	May 1993	\$2,714,883	\$2,714,883
FY94	Aug 1993	\$3,096,468	Nov 1993	\$4,096,133	Feb 1994	\$3,191,032	May 1994	\$251,494	\$10,635,127
FY95	Aug 1994	\$354,126	Nov 1994	\$976,700	Feb 1995	\$1,894,030	May 1995	\$6,489,891	\$9,714,747
FY96	Aug 1995	\$0	Nov 1995	\$504,100	Feb 1996	\$2,921,600	May 1996	\$3,902,426	\$7,328,126
FY97	Aug 1996	\$1,682,061	Nov 1996	\$1,581,266	Feb 1997	\$395,100	May 1997	\$3,530,758	\$7,189,185
FY98	Aug 1997	\$1,066,300	Nov 1997	\$1,157,260	Feb 1998	\$909,350	May 1998	\$2,001,608	\$5,134,518
FY99	Aug 1998	\$1,521,100	Nov 1998	\$2,464,263	Feb 1999	\$1,481,700	May 1999	\$5,758,077	\$11,225,140
FY00	Aug 1999	\$1,315,767	Nov 1999	\$1,847,900	Feb 2000	\$1,679,000	May 2000	\$1,070,100	\$5,912,767
FY01	Aug 2000	\$1,148,400	Nov 2000	\$388,000	Feb 2001	\$1,640,931	May 2001	\$804,800	\$3,982,131
FY02	Aug 2001	\$4,480,735	Nov 2001	\$704,040	Feb 2002	\$1,804,200	May 2002	\$5,002,691	\$11,991,666
FY03	Aug 2002	\$1,962,600	Nov 2002	\$4,461,768	Feb 2003	\$7,955,752	May 2003	\$1,836,600	\$16,216,720
FY04	Aug 2003	\$2,021,940	Nov 2003	\$1,306,200	Feb 2004	\$1,770,760	May 2004	\$3,295,400	\$8,394,300
FY05	Aug 2004	\$2,756,659	Nov 2004	\$6,013,436	Feb 2005	\$4,054,060	May 2005	\$2,636,700	\$15,460,855
FY06	Aug 2005	\$5,377,487	Nov 2005	\$4,589,600	Feb 2006	\$1,519,463	May 2006	\$6,489,676	\$17,976,226
FY07	Aug 2006	\$0	Nov 2006	\$4,947,414	Feb 2007	\$8,789,300	May 2007	\$8,121,023	\$21,857,737
FY08	Aug 2007	\$3,915,500	Nov 2007	\$4,355,750	Feb 2008	\$1,392,400	May 2008	\$4,436,600	\$14,100,250
FY09	Aug 2008	\$4,196,399	Nov 2008	\$352,000	Feb 2009	\$1,990,300	May 2009	\$4,872,400	\$11,411,099
FY10	Aug 2009	\$5,462,736	Nov 2009	\$616,600	Feb 2010	\$2,679,600	May 2010	\$4,845,000	\$13,603,936
FY11	Aug 2010	\$723,700	Nov 2010	\$3,183,250	Feb 2011	\$4,123,100	May 2011	\$4,258,900	\$12,288,950
FY12	Aug 2011	\$3,695,100	Nov 2011	\$2,417,378	Feb 2012	\$848,300	May 2012	\$7,010,324	\$13,971,102
FY13	Aug 2012	\$21,299,965	Nov 2012	\$1,004,610	Feb 2013	\$2,460,000	May 2013	\$2,675,000	\$27,439,575
FY14	Aug 2013	\$7,550,310	Nov 2013	\$0	Feb 2014	\$2,929,700	May 2014	\$2,271,852	\$12,751,862
FY15	Aug 2014	\$4,053,000	Nov 2014	\$7,647,400	Feb 2015	\$10,128,648	May 2015	\$4,803,450	\$26,632,498
Total		\$77,680,353		\$54,615,068		\$66,558,326		\$89,079,653	\$287,933,400

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.

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-six 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:	\$ 36.5	\$ 4.0	\$ 40.5 (14%)
Design:	11.7	1.2	12.9 (5%)
Construction:	162.2	57.5	219.7 (76%)
Eng. Services During Const.:	11.4	3.5	14.9 (5%)
TOTAL	\$ 221.8 (77%)	\$ 66.2 (23%)	\$ 288.0 (100%)

Program Results

The I/I Local Financial Assistance Program began in May 1993. Through FY15, a total of 481 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 FY15) for planning/inspection include the following:

- 1,615 miles of sewer TV inspected
- 1,107 miles of sewer flow isolated
- 1,126 miles of sewer smoke tested
- 43,080 sewer manholes inspected
- 60,981 buildings inspected

Results for all projects (FY93 through FY15) targeting infiltration reduction include the following:

- 52 miles sewer replaced
- 119 miles sewer CIP lined
- 141 miles sewer tested/chemically sealed
- 2,327 sewer spot repairs
- 10,499 service connection repairs
- 4.7 miles underdrains sealed

Results for all projects (FY93 through FY15) targeting inflow reduction include the following:

- 953 catch basins disconnected
- 39 miles of new or replaced storm drains
- 13,120 manholes rehabilitated/sealed
- 2,246 manhole covers replaced or inflow seals installed
- 430 sump pumps redirected
- 5,197 downspouts/area drains disconnected

Stormwater and I/I Impacts to the Collection System

The system annual average daily flow is approximately 360 mgd (last 26 years); minimum dry weather flows drop to 230 mgd; peak wet weather flow during significant rainfall exceed the 1270 mgd capacity at the Deer Island Treatment Plant (more than 3.5 times the average flow), and significant additional system capacity is available at combined sewer overflow (CSO) outfalls and storage facilities. Few problems exist within local and regional sewer systems during dry weather or as a result of small and medium storm events. However, stormwater entering combined sewers as well as I/I throughout the system reduce pipeline capacity in the collection system that would otherwise be available to transport sanitary flow. The result, during extreme storm events, may be sewer system surcharging and sanitary sewer overflows (SSOs). I/I also results in the transport of groundwater and surface water out of the natural watershed.

Estimated Flow Reduction

The estimated average daily flow reduction associated with completed local I/I reduction projects that have received MWRA financial assistance is about 86 million gallons per day (mgd). This flow reduction “ballpark” figure is based on the communities’ (or their consultants’) peak I/I reduction estimates, which have been prorated by MWRA staff to estimate an annual average I/I reduction. Some additional I/I reduction may be expected from projects not funded by MWRA. The estimated I/I reduction represents groundwater and stormwater that no longer enter the collection system at the point of repair. Regional wastewater flow reductions resulting from specific local I/I reduction projects are difficult to substantiate through end-of-the-collection-system meter data due to factors noted below:

- Wastewater flows within the collection system vary dramatically due to changes in precipitation. For example, annual average daily flow for MWRA’s system varies up to 100 mgd from year to year (from a low of less than 300 mgd to a high of more than 400 mgd). Small flow reductions for individual projects (typically less than one mgd) are dwarfed by regional flow fluctuations;
- Sewer capacity gained by elimination of I/I in one subsystem may, in some cases, allow for other I/I to enter the collection system at a different location, resulting in less net flow reduction at the end of the collection system;
- MWRA’s numerous pumping and interceptor upgrades, as well as combined sewer overflow and system optimization projects, have resulted in an increase in the capture and treatment of wastewater flow and the reduction of raw sewage discharges. When reviewing end-of-the-collection system meter data, these increased flows to the Deer Island Treatment Plant offset upstream I/I reductions; and,

- Over the last 20 years sewered population in the service area has increased by about 150,000 leading to an increase in sanitary sewage. Conversely, during the same 20 year period, per capita water use returned to the sewer system has decreased due to installation of low-flow plumbing fixtures and appliances leading to a decrease in sanitary sewage.

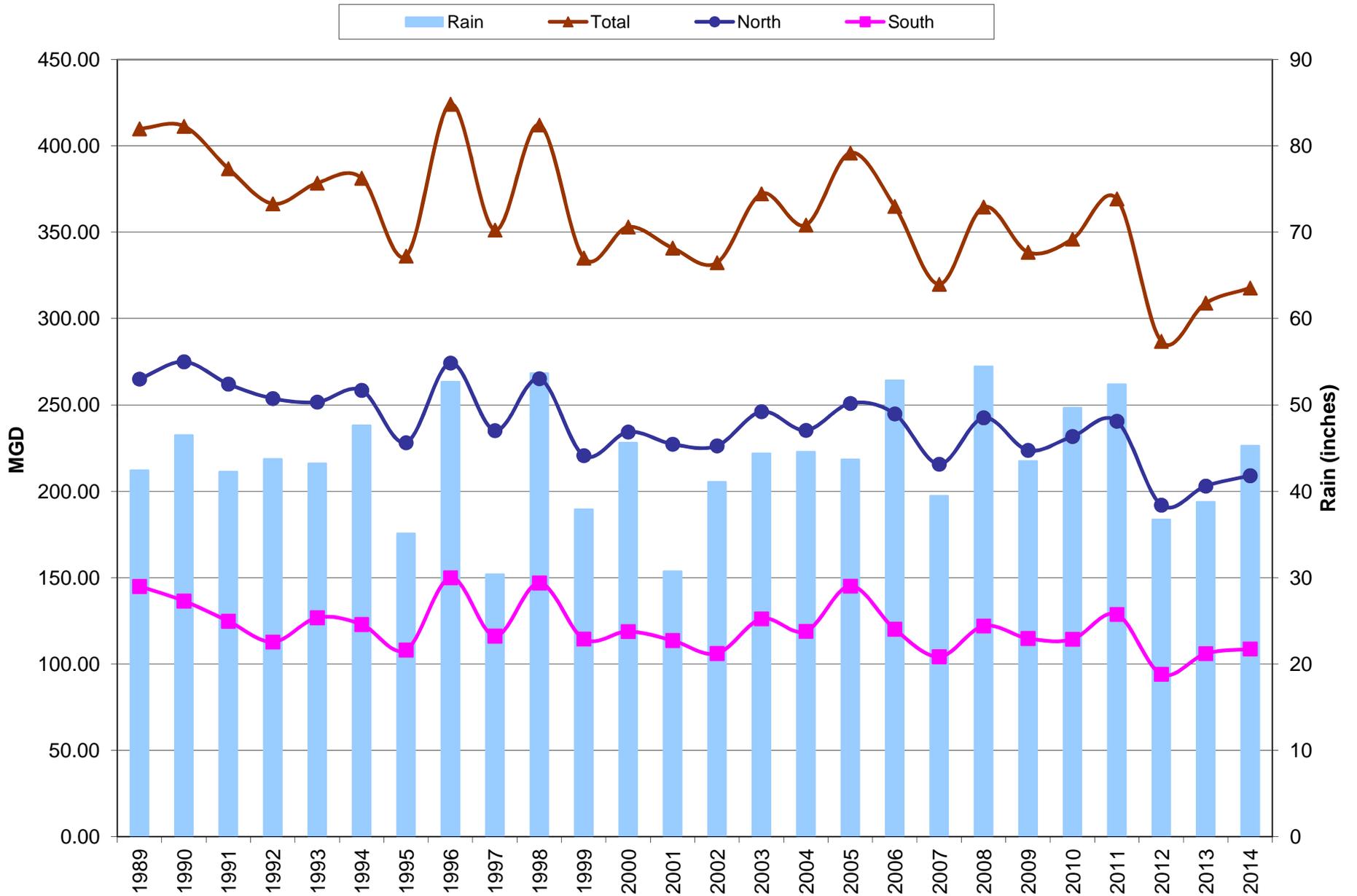
Taking these factors into account, long-term metering records will continue to be analyzed to monitor regional wastewater flow trends. The graph shown on page 7 presents long-term (26 years from 1989 through 2014) regional flow data for the Deer Island Treatment Plant collection system and annual rainfall. The 26-year average daily flow for the total system was 360 mgd and the average annual rainfall over those 26 years was 44 inches (local NOAA site at Boston Logan Airport). The same 26-year (1989 through 2014) long-term regional flow and annual rainfall data are presented again on page 8, both recalculated as 5-year running averages. The 5-year running average smoothes the extreme highs and lows within the annual data. The 5-year running average data over the last 26-years clearly shows the regional wastewater flow trend is declining while the annual rainfall trend is modestly increasing. The data show an approximate 65 mgd (from about 390 mgd to about 325 mgd) reduction in wastewater flow tributary to the Deer Island Treatment Plant over the long-term. This flow reduction is greater than 15 percent.

Over the last five years (2010-2014), MWRA's average daily flow of 325 mgd is 35 mgd (10%) below the long-term average; while the five-year rainfall has been average. Over the last three years (2012-2014), MWRA's average daily flow of 305 mgd is 55 mgd (15%) below the long-term average; while the three-year rainfall average has been somewhat below average at 40 inches.

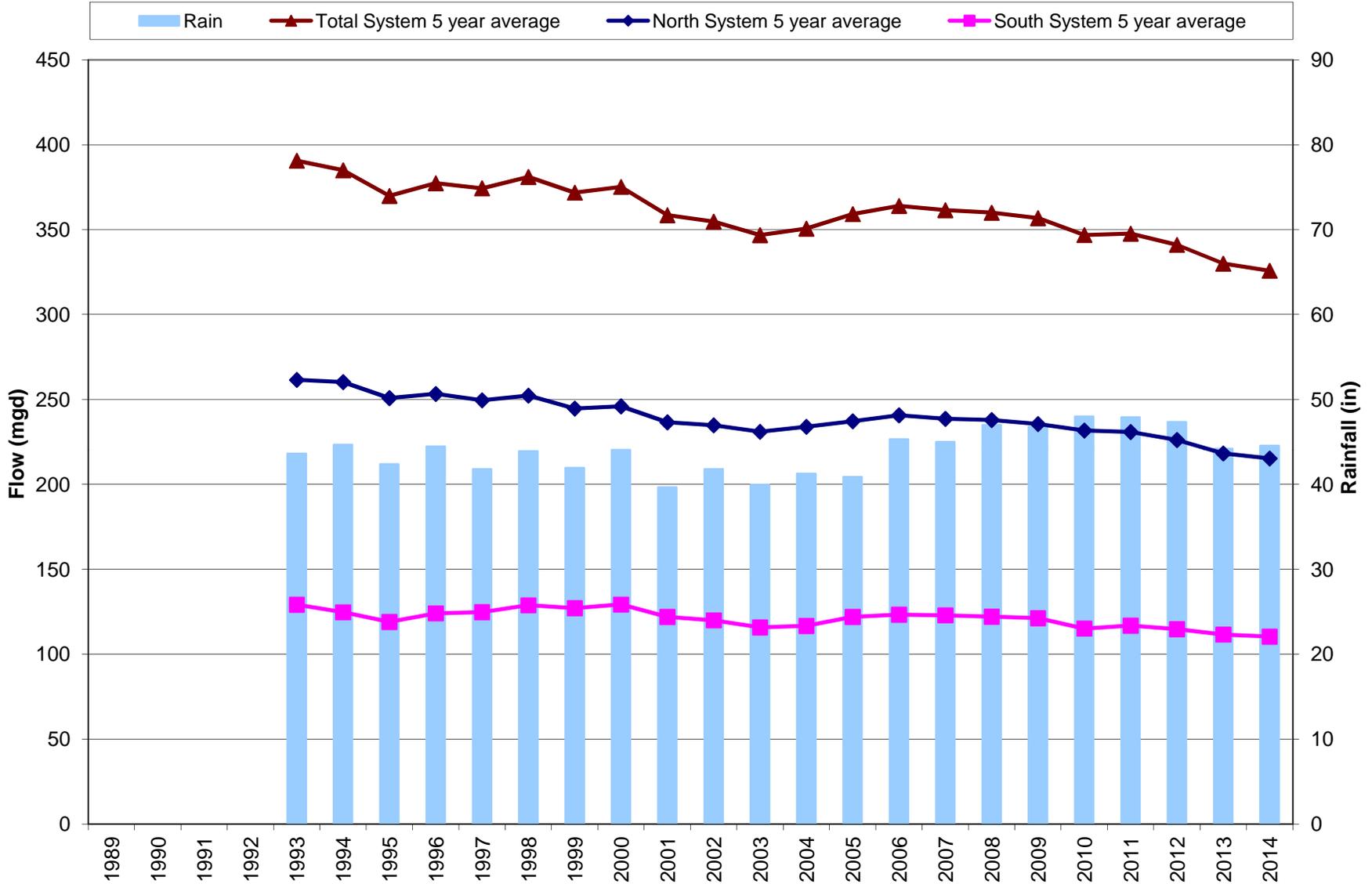
Community Projects Funded During FY15

Local community projects are funded quarterly under the MWRA I/I Local Financial Assistance Program. Attached (after page 8) are funding summaries for the four quarterly funding distributions during FY15: August 2014 with \$4,053,000 distributed (two communities funded: Newton and Quincy), November 2014 with \$7,647,400 distributed (five communities funded: Brookline, Newton, Stoneham, Stoughton and Wakefield), February 2015 with \$10,128,648 distributed (nine communities funded: Braintree, Dedham, Hingham, Natick, Norwood, Walpole, Waltham, Weymouth and Winchester), and May 2015 with \$4,803,450 distributed (six communities funded: Arlington, Framingham, Lexington, Norwood, Wakefield and Woburn).

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



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



MWRA I/I Local Financial Assistance Program Funding Summary

August 2014 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Newton	\$ 2,296,000
Quincy	\$ 1,757,000
	<hr/>
Total	\$ 4,053,000

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-24-3-901

CITY OF NEWTON

CONSTRUCTION OF THE CIP PROJECT 2 SEWER REHABILITATIONS

SCOPE OF SERVICES

This sewer rehabilitation project is a result of previous sewer investigation work performed under the "CIP – Project 2 Inspection and Assessment" Final Report dated January 28, 2014.

This construction project will include the rehabilitation/repair of the defects found in the sanitary sewer subareas B005, B006, B008, B009, B018, B019, B020, B025, B026 and B031.

The approximate scope of work includes but is not necessarily limited to: cleaning & inspecting approximately 10,100 linear feet of 5" to 36" diameter sewer; chemical root treatment of approximately 28,000 linear feet of 8" to 15" diameter sewer; installation of approximately 15,600 linear feet of 8" to 15" diameter cured-in-place manhole-to-manhole pipe liners; installation of approximately 1,100 linear feet of 8" & 15" diameter cured-in-place manhole-to-manhole structural pipe liners; installation of approximately 950 linear feet of 8" to 15" diameter cured-in-place short liners; installation of approximately 120 linear feet of 8" & 10" diameter cured-in-place structural short liners; open cut point repair of sewer at 10 locations; inspection, testing and sealing of approximately 163 service connections; cutting of approximately 61 protruding service connections; replace 12 wye connections; installation of lateral liners at 9 sewer service connections; chemical root treatment of 38 manholes; cementitious lining of 280 manholes; sealing 7 access ports to the underdrain; sealing 12 cross-connections to the underdrain; installation of 50 manhole Inflow dishes; repair bench/invert at 1 manhole; repair chimney at 3 manholes; replace manhole frame & cover at 46 locations; raise manhole frame & cover at 3 locations; install 7 sewer manholes; and all other related tasks and appurtenances.

SUMMARY OF PROJECT COSTS

<u>Description of Task</u>	<u>Total Cost</u>	<u>Eligible Cost</u>
CIP Project 2 Sewer Rehabilitations	\$3,386,250	\$2,003,177
Engineering Services During Construction	\$ 495,000	\$ 292,823
TOTAL PROJECT COST	\$3,881,250	\$2,296,000

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-24-3-901

CITY OF NEWTON

CONSTRUCTION OF THE CIP PROJECT 2 SEWER REHABILITATIONS

PROJECT SCHEDULE

<u>Description of Task</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction of Sewer Rehabilitations	September 2014	June 2015
Re-test Warranty Inspection	-----	Spring 2016

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**CITY OF QUINCY, MASSACHUSETTS
COASTAL STRUCTURES I/I REDUCTION - PHASE IIB
MWRA PROJECT NO. WRA-P9-26-3-903**

SCOPE OF SERVICES

This project is a combination of planning, design and construction, including the identification and prioritization of rehabilitating sewer pipeline in the City of Quincy that is a source of groundwater, seawater and/or stormwater I/I to the sewer system. It is part of the City's Phased I/I Removal Program. Phase I – Coastal Manholes Rehabilitation was completed in Spring 2011. Phase IIA – Coastal Structures I/I Reduction (MWRA Project No. WRA-P7-26-3-737) was completed in Summer 2012.

Phase IIB of the City's Phased I/I Removal Program will focus on sections of sewer pipeline identified for repair that were not covered under Program's Phase IIA. Phase IIB repairs to coastal sewer pipeline will include cured-in-place-pipe (CIPP) lining from manhole-to-manhole, open cut dig and replace pipe repair and follow-up service connection grouting as part of the CIPP lining process.

The Phase IIB Coastal Structures I/I Reduction Project targets coastal areas of the City along East Squantum Street and in the Hough's Neck / Rock Island Cove areas.

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 0.65 mgd. Total project cost is estimated at \$1,757,000 (Design = \$30,000 / Construction = \$1,667,000 / Construction Services = \$60,000). Eligible MWRA I/I Local Financial Assistance is \$1,757,000.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Phase IIB I/I Reduction:		
Design	June 2014	August 2014
Permitting/Bid/Award	September 2014	October 2014
Construction	November 2014	January 2015
Final Inspection	June 2015	July 2015

MWRA I/I Local Financial Assistance Program Funding Summary

November 2014 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Brookline	\$ 2,139,800
Newton	\$ 3,668,000
Stoneham	\$ 814,000
Stoughton	\$ 974,300
Wakefield	\$ 51,300
Total	<hr/> \$ 7,647,400

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
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PROJECT NO. WRA-P9-07-3-907

TOWN OF BROOKLINE

INFILTRATION INVESTIGATION IN SEWER SUBAREAS NI-9, NI-10 & NI-11
AND
DESIGN & CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS IN SEWER
SUBAREAS NI-8, NI-9, NI-19 & NI-11 (CONTRACT #PW/15-10)

SCOPE OF SERVICES

Infiltration Investigation In Sewer Subareas NI-9, NI-10 & NI-11 The investigative work involves the nighttime flow isolation of the sewer segments in the subject subareas to identify areas of excessive infiltration and the closed-circuit television inspection (CCTV) of the sewer segments targeted from the results of the flow isolation work. A Technical Memorandum will be prepared which will include an analysis of the flow isolation data; evaluation of the CCTV inspection reports and presents conclusions and recommendations for infiltration removal.

Design & Construction of Recommended Sewer Rehabilitations in Sewer Subareas NI-8, NI-9, NI-10 & NI-11. The design work involves the preparation of biddable Contract Documents based on the recommendations from the Technical Memorandum and previously recommended sewer rehabilitations in Sewer Subarea NI-8 which have not been implemented.

The construction of the recommended sewer rehabilitations will be those as presented in the Contract #PW/15-10 Contract Documents. The specific work involves: cured-in-place (CIPP) lining of approximately 17,215 lf of 8-inch to 20-inch diameter sanitary sewers; open-cut point repair at seven (7) locations; epoxy lining approximately 1,300 vf of sewer manholes; reconstructing five (5) manholes bench & inverts; adjusting five (5) manhole frames & covers; replacing seventeen (17) manhole frames & covers; and all appurtenances.

This funding distribution project is part of the continuing Capital Improvement Program identified in the 1999 Wastewater Master Plan. Under this project, that Master Plan will be updated to reflect all work completed since 1999.

PROJECT COST SUMMARY

<u>Description of Task</u>	<u>Estimated Cost</u>
Infiltration Investigations in Subareas NI-9, NI-10 & NI-11	\$ 164,685
Design of Recommended Sewer Rehabilitations	\$ 61,458
Engineering Services During Construction	\$ 198,945
Construction of Sewer Rehabilitations (Contract #PW/15-10)	\$1,714,712
TOTAL ESTIMATED PROJECT COST	<u>\$2,139,800</u>

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-07-3-907

TOWN OF BROOKLINE

**INFILTRATION INVESTIGATION IN SEWER SUBAREAS NI-9, NI-10 & NI-11
AND
DESIGN & CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS IN SEWER
SUBAREAS NI-8, NI-9, NI-19 & NI-11 (CONTRACT #PW/15-10)**

PROJECT SCHEDULE

<u>General Description of Work Performed</u>	<u>Start Date</u>	<u>Completion Date</u>
Infiltration Investigations in Subareas NI-9, NI-10 & NI-11	December 2013	September 2014
Design of Recommended Sewer Rehabilitations	July 2014	November 2014
Construction of Sewer Rehabilitations (Contract #PW/15-10)	November 2014	June 2015

ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P9-24-3-904
CITY OF NEWTON

- PROJECT #1: SEWER INSPECTION & ASSESSMENT IN THE CIP PROJECT #5 AREA
- PROJECT #2: DESIGN OF SEWER REHABILITATIONS IN CIP PROJECT AREAS #3 & #4
- PROJECT #3: CONSTRUCTION OF THE CIP PROJECT AREA #2 SEWER REHABILITATIONS
- PROJECT #4: CONSTRUCTION OF THE CIP PROJECT AREAS #3 & #4 SEWER REHABILITATIONS

SCOPE OF SERVICES

Project #1: Sewer Inspection & Assessment in the CIP Project #5 Area This Project will identify defects in the sewer system that contribute to infiltration and inflow (I/I) in Sewer Subareas B053, B054, B055, B056, B056A, B057 & F001. These subareas include an estimated 119,741 lf of sanitary sewer. The field work for this project will include, but not be limited to: conducting top side physical survey of sewer manholes for sources of I/I; conducting flow isolation of sewers; cleaning and internal TV inspection of sewers; 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.

Project #2: Design of Sewer Rehabilitations in CIP Project Areas #3 & 4 This Project involves the design and preparation of Contract Documents for the sewer rehabilitations recommended in the CIP Project Areas #3 & 4 which is currently under investigation and evaluation. The specific sewer subareas are: for CIP Project Area #3, B001, B002, B003, B004, B011, B012, B013 and B027; for CIP Project Area 4, B004, B045, B046, B047, B048, B049, B050, B051, B052 & B074.

Project #3: Construction of the CIP Project Area #2 Sewer Rehabilitations The Scope of Services for this project is the same as for the MWRA funded Project #WRA-P9-24-3-901. The Estimated Construction Cost under that project, which was \$3,386,520, was based upon the cost estimate in the City's 2011 Capital Improvement Plan Budget. Since that funding distribution, bids have been accepted for this project so that the updated Project Cost is \$5,300,000.

Project #4: Construction of the CIP Project Areas #3 & #4 Sewer Rehabilitations This sewer rehabilitation work will generally include: cleaning & inspecting sewers; chemical root treatment of sewers; installation of cured-in-place manhole-to-manhole pipe liners; installation of cured-in-place short liners; open cut point repair of sewers; inspection, testing and sealing of service connections; cutting of protruding service connections; replacing wye connections; installation of lateral liners at sewer service connections; chemical root treatment of manholes; cementitious lining of manholes; sealing access ports to the underdrain; sealing cross-connections to the underdrain; installation of manhole Inflow dishes; various manholes repairs (bench, invert, chimney); manhole frame & cover replacing & raising; installing sewer manholes; and all other related tasks and appurtenances.

SUMMARY OF PROJECT COSTS

	Total Cost	Eligible Cost
Sewer Inspection & Assessment in the CIP Project #5 Area	\$ 569,250	\$ 251,679.24
Design of Sewer Rehabilitations in CIP Project Areas #3 & #4	\$ 374,700	\$ 374,700.00 (1)
Construction Engineering - CIP Project Area #2 Sewer Rehabilitations	\$ 630,500	\$ 278,759.35
Construction Engineering - CIP Project Areas #3 & #4 Sewer Rehabilitations	\$ 800,000	\$ 353,699.42
Construction of CIP Area #2 Sewer Rehabilitations	\$ 5,300,000	\$2,343,258.65
Construction of CIP Areas 3 & #4 Sewer Rehabilitations	<u>\$ 6,962,500</u>	<u>\$3,078,290.27</u>
TOTAL PROJECT COST	\$14,636,950	\$6,680,386.93

Note: (1) MWRA staff approved the City's request of 10/14/14 to use a portion of the unused funds for this Design Cost.

The funding sources for the Eligible Cost is as follows:

Total Eligible Project Cost:	\$ 6,680,386.93
Unused Prior Distributed Funds:	\$ 373,783.81
MMDT Unused Interest:	\$ 342,603.12
Phase 7 & 8 Funding Allotment:	\$ 2,296,000.00
Phase 9 Funding Allotment:	\$ 3,668,000.00

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-24-3-904

CITY OF NEWTON

**PROJECT #1: SEWER INSPECTION & ASSESSMENT IN THE CIP PROJECT #5 AREA
PROJECT #2: DESIGN OF SEWER REHABILITATIONS IN CIP PROJECT AREAS #3 & #4
PROJECT #3: CONSTRUCTION OF THE CIP PROJECT AREA #2 SEWER REHABILITATIONS
PROJECT #4: CONSTRUCTION OF THE CIP PROJECT AREAS #3 & #4 SEWER REHABILITATIONS**

PROJECT SCHEDULE

<u>Description of Project</u>	<u>Start Date</u>	<u>Completion Date</u>
Sewer Inspection & Assessment in the CIP Project #5 Area	January 2015	November 2015
Design of Sewer Rehabilitations in CIP Project Areas #3 & #4	December 2014	July 2015
Construction of the CIP Project Area #2 Sewer Rehabilitations	December 2014	September 2015
Re-testing & Warranty Inspection	April 2016	September 2016
Construction of CIP Project Areas #3 & #4 Sewer Rehabilitations	September 2015	January 2017
Re-testing & Warranty Inspection	April 2017	September 2017

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
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PROJECT NO. WRA-P9-31-3-905

TOWN OF STONEHAM

PLANNING, DESIGN & CONSTRUCTION
OF
PHASE 5 SEWER SYSTEM I/I REHABILITATIONS

SCOPE OF SERVICES

This project consists of the work associated with the final planning, design and construction of sewer rehabilitations as presented in the Contract Documents for the Phase 5 Sewer System I/I Rehabilitations Project including associated engineering administration and on-site services during construction.

Under the final planning phase, prior studies, reports and inspection data performed throughout the Town's sewer system were reviewed with Town officials and evaluated to determine the sewer rehabilitations to be included under Phase 5 Sewer System I/I Rehabilitations Project. Consequently, the sewer rehabilitation work is located in multiple areas throughout the Town.

During final planning/design, recommendations from previous investigations will be reviewed holistically and final rehabilitation recommendations will be made based on the severity of defects, their associated I/I contribution, and the cost effectiveness of rehabilitation for I/I removal. Rehabilitation methods will consist primarily of cured-in-place pipe lining, but may also include: testing and sealing of pipe joints and service connections, cured-in-place spot repairs, and open cut excavation repairs. Manhole rehabilitation methods may include lining manhole chimneys; chemical sealing of walls and joints, pipe connections, and bench and invert; as well as mono-lining and epoxy lining of manholes.

PROJECT COST SUMMARY

<u>Description of Task</u>	<u>Estimated Cost</u>
Final Planning & Design Services	\$ 96,000
Services During Bid & Award	\$ 6,200
Construction of Sewer Rehabilitations	\$ 600,000
Construction Administration Services	\$ 24,900
Resident Engineering During Construction	\$ 134,800
As-Built Quantities/Record Drawings Preparation	\$ 3,100
TOTAL ESTIMATED PROJECT COST	<u>\$ 865,000</u>

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P9-31-3-905

TOWN OF STONEHAM

PLANNING, DESIGN & CONSTRUCTION
OF
PHASE 5 SEWER SYSTEM I/I REHABILITATIONS

PROJECT SCHEDULE

<u>Milestone</u>	<u>Start Date</u>	<u>Completion Date</u>
Final Planning & Design	July 2013	November 2014
Bidding & Award	November 2014	December 2014
Sewer Rehabilitations Construction	January 2015	May 2015
Warranty Inspection & Project Closeout	March 2016	June 2016

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF STOUGHTON SEWER SYSTEM REHABILITATION (CONTRACT 14-1)
YEARS 8 / 9 / 10: INFILTRATION REHABILITATION**

MWRA PROJECT NO. WRA-P9-32-3-902

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. This project is part of a ten-year annual I/I identification and removal program. The project area includes Stoughton Subareas 1 / 2 / 3 / 9 / 10 / 11 / 12 / 13 / 14. Project work will include, but not be limited to, the following:

1. **Years 8 / 9 / 10 I/I Design:** Design cost-effective and value-effective sewer rehabilitations in Subareas 1 / 2 / 3 / 9 / 10 / 11 / 12 / 13 / 14; prepare construction drawings and specifications for rehabilitation design public bidding; and prepare a final cost estimate for the designed rehabilitations. (Estimated Design Cost = \$70,000).

2. **Years 8 / 9 / 10 I/I Construction:** Construction of cost-effective and value-effective sewer rehabilitations in Subareas 1 / 2 / 3 / 9 / 10 / 11 / 12 / 13 / and the performance of construction services (public bid and award). Sewer rehabilitation work (Base Bid) includes approximately: 17,707 LF of cleaning and television inspection in 6 to 21-inch of sewer; 994 LF of heavy cleaning and television inspection in 21-inch sewer; testing 4168 joints in 6 to 21-inch sewers; sealing 1513 joints in 6 of 21-inch sewers; performing 9434 LF of chemical root treatment in 8 to 21-inch sewers; performing chemical root treatment in 8 manholes; installing 120 LF of cured-in-place (CIP) short liners in 8 to 21-inch sewers; installing 24 LF of structural CIP short liner in 8-inch sewer; installing 1268 LF of CIP pipe in 8 to 15-inch sewers; installing 543 LF of structural CIP pipe in 21-inch sewer; cutting five protruding service connections; television inspection and testing 94 service connections; grouting 94 service connections; exterior grouting and interior cementitious lining of 571 VF of manholes; repairing one manhole bench and invert; repairing two manhole chimneys; replacing four manhole frames and covers; and installing 37 manhole inflow dishes. (Estimated Construction Cost = \$794,300 / Estimated Construction Services Cost = \$110,000).

The above work will be performed pursuant to the terms and conditions detailed within Task Order No. 6 under the January 17, 2013 General Engineering Services Agreement By and Between the Town of Stoughton and Weston & Sampson Engineers, Inc. and the approved MWRA Phase 9 I/I Local Financial Assistance Project Application received July 30, 2014.

Total project cost is estimated at \$974,300. (Design = \$70,000 / Construction = \$794,300 / Construction Services = \$110,000). Eligible MWRA I/I Local Financial Assistance is \$974,300. As a result of the above work, an estimated 0.19 mgd of peak infiltration will be removed from the collection system upon contract completion.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF STOUGHTON SEWER SYSTEM REHABILITATION (CONTRACT 14-1)
YEARS 8 / 9 / 10: INFILTRATION REHABILITATION**

MWRA PROJECT NO. WRA-P9-32-3-902

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	May 2014	July 2014
Permitting/Bid/Award	August 2014	December 2014
Construction	January 2015	May 2015
Final Inspection	June 2015	July 2015

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM – PHASE 9
ATTACHMENT A
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PROJECT NO. WRA-P9-33-1-906

TOWN OF WAKEFIELD

**SEWER SUBAREA 6 – GAUGING AREAS 6 & 7
SMOKE TESTING, DYE WATER TESTING & FLOODING
AND
FLOW ISOLATION OF SEWERS**

SCOPE OF SERVICES

The specific portions of Sewer Subarea 6 – Gauging Areas 6 & 7 in which the sewer investigations will be conducted are presented in the two sewer maps (Figure 1A & 1B) in Attachment #2 of the Financial Assistance Application.

This funded investigation project will include performing: smoke testing of approximately 52,000 linear feet of sewer; dyed water testing of up to 10 suspected Inflow sources sites; dyed water flooding of up to 5 suspected Inflow sources sites in conjunction with television inspection of the sanitary sewer (up to 300 lf per dye flood); flow isolation of approximately 52,000 linear feet of 6” to 24” sewer.

A detailed letter report will be prepared that will describe the areas in which the work was performed, summarize the work completed and include results of the smoke testing, dye water testing and flooding and recommendations, a cost-effectiveness analysis and a prioritization analysis for rehabilitation of those defects and sources of Inflow that have been identified. Estimated construction costs will also be provided. For those sources of Inflow that will require additional investigative work, the report will include a plan and cost estimate to conduct the investigation.

For the flow isolation of sewers portion of this project, the “2013 I/I Investigation – Gauging Areas 6 & 7” draft letter report dated December 16, 2013 will be updated to include results of this additional work.

ESTIMATED PROJECT COST SUMMARY

<u>Description of Task</u>	<u>Estimated Cost</u>
Flow Isolation, Smoke testing, Dye Water Testing & Flooding	\$ 70,300

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM – PHASE 9

ATTACHMENT B

FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P9-33-1-906

TOWN OF WAKEFIELD

**SEWER SUBAREA 6 – GAUGING AREAS 6 & 7
SMOKE TESTING, DYE WATER TESTING & FLOODING
AND
FLOW ISOLATION OF SEWERS**

PROJECT SCHEDULE

<u>General Description of Work Performed</u>	<u>Start Date</u>	<u>Completion Date</u>
Smoke Testing, Dye Water Testing & Flooding	August 2014	November 2014
Flow Isolation of Sewers	March 2015	May 2015

MWRA I/I Local Financial Assistance Program Funding Summary

February 2015 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Braintree	\$ 1,750,000
Dedham	\$ 913,000
Hingham	\$ 379,648
Natick	\$ 808,200
Norwood	\$ 148,100
Walpole	\$ 1,113,700
Waltham	\$ 3,569,000
Weymouth	\$ 776,000
Winchester	\$ 671,000
Total	\$ 10,128,648

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF BRAINTREE, MASSACHUSETTS
I/I INVESTIGATION AND REHABILITATION PROGRAM - YEARS 3 / 4
ANNUAL WASTEWATER FLOW MONITORING PROGRAM - YEAR 2
MWRA PROJECT NO. WRA-P9-06-3-915**

SCOPE OF SERVICES

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

Year 3 I/I Investigation – Study / Design (Est. Cost = \$ 200,000)

1. Flow isolate as much as 43,000 LF of sewer in Braintree Sewer Subareas U1 / W5 / W6 to quantify infiltration amounts within manhole-to-manhole segments of sewer. The inspection will be conducted between the hours of 12AM and 6AM when groundwater levels are typically at their highest and sanitary flows are at a minimum.
2. Clean, TV inspect, videotape and record as much as 43,000 LF of sewer in Braintree Sewer Subareas U1 / W5 / W6. The TV inspection will be performed to locate problem areas and I/I sources within manhole-to-manhole segments of sewer. The inspection will be conducted in Spring 2015 when groundwater levels are typically at their highest.
3. Conduct topside physical survey of as many as 215 sewer manholes in Braintree Sewer Subareas U1 / W5 / W6 for defects and I/I sources. A written log will be furnished for each manhole inspected.
4. 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. Construction plans and specifications (to remove excessive I/I identified during this investigation) will be developed and submitted, followed by rehabilitation construction. (Study = \$145,000 / Design = \$55,000)

Year 3 I/I Investigation – Construction / Construction Services (Est. Cost = \$ 625,000)

Project rehabilitation work will include, but not be limited to, the following: Clean/inspect/test and seal 1207 LF of sewer; inspect 13 sewer manholes; test and seal 13,184 LF of sewer; perform 3120 LF of root treatment; install 2273 LF of CIP pipe; install short liners at 58 locations; grout 65 service connections; line 8 service laterals; rehabilitate 17 manholes; and replace 2 manhole frames & covers. (Construction = \$525,000 / Construction Services = \$100,000)

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A (continued)
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF BRAINTREE, MASSACHUSETTS
I/I INVESTIGATION AND REHABILITATION PROGRAM - YEARS 3 / 4
ANNUAL WASTEWATER FLOW MONITORING PROGRAM - YEAR 2
MWRA PROJECT NO. WRA-P9-06-3-915**

SCOPE OF SERVICES (continued)

Year 4 I/I Investigation – Study / Design (Est. Cost = \$ 200,000)

1. Flow isolate as much as 47,000 LF of sewer in Braintree Sewer Subareas PS1 / T3 / T4 / T5 to quantify infiltration amounts within manhole-to-manhole segments of sewer. The inspection will be conducted between the hours of 12AM and 6AM when groundwater levels are typically at their highest and sanitary flows are at a minimum.
2. Clean, TV inspect, videotape and record as much as 47,000 LF of sewer in Braintree Sewer Subareas PS1 / T3 / T4 / T5. The TV inspection will be performed to locate problem areas and I/I sources within manhole-to-manhole segments of sewer. The inspection will be conducted in Spring 2015 when groundwater levels are typically at their highest.
3. Conduct topside physical survey of as many as 235 sewer manholes in Braintree Sewer Subareas PS1 / T3 / T4 / T5 for defects and I/I sources. A written log will be furnished for each manhole inspected.
4. 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. (Study = \$145,000 / Design = \$55,000)

Year 4 I/I Investigation – Construction / Construction Services (Est. Cost = \$ 540,000)

Construction plans and specifications (to remove excessive I/I identified during the Year 4 I/I Investigation) will be developed and submitted, followed by rehabilitation construction. (Construction = \$450,000 / Construction Services = \$90,000)

Town-Wide Annual Wastewater Flow Monitoring Program (Est. Cost = \$ 185,000)

This project includes an annual wastewater flow monitoring program in various Braintree sewer subareas. Metering locations will be determined before the next program phase beginning in September 2015 (based upon the results of the ongoing I/I investigation/rehabilitation schedule).

Total project cost is estimated at \$1,750,000. Eligible MWRA I/I Local Financial Assistance is \$1,750,000. As a result of the above work, an estimated 0.40 mgd of peak I/I will be removed from the collection system upon contract completion.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF BRAINTREE, MASSACHUSETTS
I/I INVESTIGATION AND REHABILITATION PROGRAM - YEARS 3 / 4
ANNUAL WASTEWATER FLOW MONITORING PROGRAM - YEAR 2
MWRA PROJECT NO. WRA-P9-06-3-915**

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Year 3 I/I Investigation / Rehabilitation:		
I/I Investigation	January 2015	May 2015
Design / Bid and Award	May 2015	July 2015
Construction	August 2015	December 2015
Retesting	March 2016	May 2016
Year 4 I/I Investigation:		
Flow Isolation	March 2015	May 2015
TV Inspection	March 2015	May 2015
Manhole Inspection	March 2015	May 2015
Letter Report	June 2015	November 2015
Years 4 I/I Rehabilitation:		
Design	February 2016	April 2016
Bid and Award	May 2016	June 2016
Construction	July 2016	November 2016
Retesting	March 2017	May 2017
Annual Wastewater Flow Monitoring Program - Year 2		
Flow Monitoring Investigation	September 2015	August 2016
Letter Report	September 2016	December 2016

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

TOWN OF DEDHAM, MASSACHUSETTS

I/I REHABILITATION PROJECT

MWRA PROJECT NO. WRA-P9-12-3-908

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 include, but not be limited to, the following:

Sewer rehabilitation work includes the installation of approximately 24,900 linear feet (LF) of cured-in-place (CIP) pipe within 8 to 24-inch vitrified clay sewer; installation of 21 short liners within 8 to 12-inch vitrified clay sewer; installation of 23 short liners within 6 to 8-inch vitrified clay / cast iron sewer; and CIP lining of 30 service connections. (Estimated Rehabilitation Construction Cost = \$1,306,815)

The above work will be performed pursuant to the terms and conditions detailed within the approved MWRA Phase 9 I/I Local Financial Assistance Project Application received December 2, 2014.

Total project cost is estimated at \$1,306,815. (Rehabilitation Construction Cost = \$1,306,815) Eligible MWRA I/I Local Financial Assistance is \$913,000 (Phase 9 Funding Allocation Limit). As a result of the above work, an estimated 0.43 mgd of peak infiltration will be removed from the collection system upon contract completion.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT
TOWN OF DEDHAM, MASSACHUSETTS
I/I REHABILITATION PROJECT
MWRA PROJECT NO. WRA-P9-12-3-908**

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Project Bid	February 2015	February 2015
Notice To Proceed	March 2015	March 2015
Construction	April 2015	October 2015
Retesting	March 2016	April 2016

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF HINGHAM, MASSACHUSETTS
I/I INVESTIGATION & REHABILITATION PROGRAMS
TOWN-WIDE FLOW METERING PROGRAM
MWRA PROJECT NO. WRA-P9-15-3-913**

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 include, but not be limited to, the following:

Manhole Rehabilitation: Rehabilitate and raise nine (9) sewer manholes. Manholes 361 / 363 / 364 / 365 / 366 / 367 / 368 / 369 / 379 are located within the Kimball / Foley / Bel Air Beach sections. Estimated cost = \$77,850.

FY15 Annual Sewer Program (Contract Amendment No. 1): Review television inspection videos of up to an additional 7000 LF of sewer. Conduct topside physical survey of as many as 15 additional sewer manholes. 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. Prepare work orders for On-Call I/I Rehabilitation Services for distribution to selected contractors. Estimated cost = \$23,000.

FY16 Annual Sewer Program: Review television inspection videos of approximately 22,500 LF of sewer. Conduct topside physical survey of as many as 150 sewer manholes. 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. Prepare work orders for On-Call I/I Rehabilitation Services for distribution to selected contractors. Estimated cost = \$65,000.

Town-Wide Flow Metering: Flow metering will be conducted in Spring 2015 for a minimum period of four (4) weeks. Groundwater and rain gauges will be installed to collect groundwater and rainfall data throughout the selected period. Estimated cost = \$140,000.

On-Call I/I Rehabilitation Services: Contract 1 (Work Order 1.2) Clean and inspect approximately 22,300 LF of sewer. Contract 2 (Work Order 2.3): Trenchless infiltration rehabilitations as recommend in Annual Town-Wide Sewer Investigation & Rehabilitation Program – FY 15 Report. Estimated cost = \$129,000.

Project work will be performed pursuant to the terms and conditions detailed within the approved MWRA Phase 9 I/I Local Financial Assistance Project Application received January 22, 2015 and the Agreements For Engineering Services By And Between The Town of Hingham, Massachusetts And Weston & Sampson Engineers. Peak I/I reduction is estimated to be 0.07 mgd. Total project cost is estimated at \$434,850. Eligible MWRA I/I Local Financial Assistance is \$379,648.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF HINGHAM, MASSACHUSETTS
I/I INVESTIGATION & REHABILITATION PROGRAMS
TOWN-WIDE FLOW METERING PROGRAM
MWRA PROJECT NO. WRA-P9-15-3-913**

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
<u>Manhole Rehabilitation</u>	Fall 2014	Winter 2015
<u>FY15 Annual Sewer Program</u>		
Add. TV Inspection & Review	Winter 2015	Spring 2015
<u>FY16 Annual Sewer Program</u>		
Manhole Inspections	Spring 2015	Spring 2015
TV Inspection & Review	Spring 2015	Summer 2015
Engineering Review/Letter Report	Summer 2015	Fall 2015
<u>Town-Wide Flow Metering</u>		
Flow Metering	Spring 2015	Spring 2015
Engineering Review/Letter Report	Summer 2015	Summer 2015

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF NATICK, MASSACHUSETTS
I/I INVESTIGATION & REHABILITATION**

MWRA PROJECT NO. WRA-P9-22-3-912

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 include, but not be limited to, the following:

Sewer System I/I Investigation: (Est. Cost = \$456,700)

1. Clean, CCTV inspect, videotape and record approximately 133,000 LF of sewer in Natick Sub-basins 6 / 11 / 14 / 16. The TV inspection will be performed to locate problem areas and I/I sources within manhole-to-manhole segments of sewer. The inspection will be conducted in Spring 2015 when groundwater levels are typically at their highest.
2. Conduct topside physical survey of approximately 760 sewer manholes in Natick Sub-basins 6 / 11 / 14 / 16. A written log will be furnished for each manhole inspected.
3. 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. Any additional rehabilitation work will be added to the existing 3 Year Sewer Rehabilitation Contract previously funded under the MWRA's I/I Local Financial Assistance Program.

Sewer Lateral CIPP Lining: (Est. Cost = \$351,500)

Project rehabilitation work will be performed in Natick Sub-basin 19 and will include, but not be limited to, the following:

1. CIPP lining of approximately 75 service lateral connections; and
2. Pre- and post-rehabilitation flow monitoring.

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 9 I/I Local Financial Assistance Project Application received January 16, 2015.

Total project cost is estimated at \$808,200. Eligible MWRA I/I Local Financial Assistance is \$808,200. As a result of the above sewer lateral rehabilitation work, an estimated 0.04 mgd of peak infiltration will be removed from the collection system upon contract completion.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF NATICK, MASSACHUSETTS
I/I INVESTIGATION & REHABILITATION**

MWRA PROJECT NO. WRA-P9-22-3-912

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Sewer System I/I Investigation:		
CCTV Inspection	March 2015	May 2015
Manhole Inspection	March 2015	May 2015
Data Evaluation / Letter Report	June 2015	August 2015
Sewer Lateral CIPP Lining:		
Pre-Construction Flow Monitoring	March 2015	May 2015
Sewer Lateral Rehabilitation	July 2015	September 2015
Post-Construction Flow Monitoring	February 2016	April 2016

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF NORWOOD, MASSACHUSETTS
SEWER MANHOLE REHABILITATION
MWRA PROJECT NO. WRA-P9-25-3-917**

SCOPE OF SERVICES

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

Sewer rehabilitation work under this project will include construction of three (3) additional underdrain access manholes in portions of the sewer system. These manholes will be used to perform additional sampling to pinpoint future rehabilitation efforts and monitor progress following corrective action. The four-foot precast underdrain access manholes will be located on St. Georges Avenue / Fulton Street / Nichols Street. Construction of the new manholes will be performed by a negotiated change order under the ongoing Hoyle Street Area Sewer Rehabilitation Project funded by MWRA in May 2013 (MWRA Project No. WRA-P8-25-3-814).

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Professional Services By and Between the Town of Norwood and CDM Smith, Inc. and the approved MWRA Phase 9 I/I Local Financial Assistance Project Application received February 6, 2015.

Total project cost is estimated at \$148,100. Eligible MWRA I/I Local Financial Assistance is \$148,100 (Design = \$34,000 / Rehabilitation Construction = \$94,600 / Construction Services = \$19,500). As a result of the above work, an estimated 0.10 mgd of peak I/I will be removed from the collection system upon contract completion.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF NORWOOD, MASSACHUSETTS
SEWER MANHOLE REHABILITATION
MWRA PROJECT NO. WRA-P9-25-3-917**

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	March 2015	April 2015
Construction	May 2015	June 2015

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WALPOLE, MASSACHUSETTS
YEAR 8 I/I INVESTIGATION - STUDY
YEARS 4 – 7 I/I REHABILITATION – DESIGN / CONSTRUCTION
MWRA PROJECT NO. WRA-P9-34-3-914**

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 include, but not be limited to, the following:

Year 8 I/I Investigation - Study: (Est. Cost = \$ 153,885)

1. Flow isolate as much as 50,000 LF of sewer in Walpole Sewer Subareas 4 / 6 to quantify infiltration amounts within manhole-to-manhole segments of sewer. The inspection will be conducted between the hours of 12AM and 6AM when groundwater levels are typically at their highest and sanitary flows are at a minimum.
2. Clean, TV inspect, videotape and record as much as 50,000 LF of sewer in Walpole Subareas 4 / 6. The TV inspection will be performed to locate problem areas and I/I sources within manhole-to-manhole segments of sewer. The inspection will be conducted in Spring 2015 when groundwater levels are typically at their highest.
3. Conduct topside physical survey of as many as 175 sewer manholes in Walpole Subareas 4 / 6 for defects and I/I sources. A written log will be furnished for each manhole inspected.
4. 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.

Years 4 -7 I/I Rehabilitation – Design / Construction: (Est. Cost = \$ 959,815)

Project rehabilitation work (in Walpole Sewer Subareas 3 / 5 / 8 / 10 / 11 / 12 / 13 / 15) will include, but not be limited to, the following: Clean/inspect/test and seal 11,084 LF of sewer; test and seal 16,079 LF of sewer; perform 344 LF of root treatment; install 3341 LF of CIP pipe; install short liners at 30 locations; perform open cut point repairs at 5 locations; grout 49 service connections; rehabilitate 96 manholes; and replace 15 manhole frames & covers. (Design/Bid & Award = \$65,000 / Construction = \$744,815 / Construction Services = \$150,000)

Total project cost is estimated at \$1,128,885. Eligible MWRA I/I Local Financial Assistance is \$1,128,885 (MWRA Phase 7/8/9 Award Amount = \$1,113,700 / Expendable MMDT Account Interest = \$9643 / Unexpended MWRA Funding = \$5542). As a result of the above work, an estimated 0.21 mgd of peak I/I will be removed from the collection system upon contract completion.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WALPOLE, MASSACHUSETTS
YEAR 8 I/I INVESTIGATION - STUDY
YEARS 4 – 7 I/I REHABILITATION – DESIGN / CONSTRUCTION
MWRA PROJECT NO. WRA-P9-34-3-914**

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Year 8 I/I Investigation:		
Flow Isolation	March 2015	May 2015
TV Inspection	March 2015	May 2015
Manhole Inspection	March 2015	May 2015
Letter Report	June 2015	November 2015
Years 4 -7 I/I Rehabilitation:		
Design	February 2015	April 2015
Bid and Award	May 2015	June 2015
Construction	July 2015	November 2015
Retesting	March 2016	May 2016

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9

ATTACHMENT A

FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P9-35-3-911

CITY OF WALTHAM

CONSTRUCTION OF "SSO MITIGATION PROJECT - AREA 1314A CEDARWOOD AREA AND SURROUNDING NEIGHBORHOODS SANITARY SEWER REHABILITATION"

SCOPE OF SERVICES

The specific location of the sewer rehabilitation work is in Area 1314A on the following streets:

Caldwell Road	Cedarwood Avenue	Cunningham Circle	Dorchester Street
Elmwood Avenue	Fairview Avenue	Fairmont Avenue	Fiske Avenue
Flagg Circle	Florence Road	Hamilton Road	Harland Road
Livingstone Lane	Main Street	Milton Street	Pleasant Avenue
Rockridge Road	Stow Street	Summit Avenue	Thornton Road
Villa Street	Virginia Road	Weston Street	Wetherbee Road

The sewer rehabilitation work will include, but not be limited to: chemical root control of approximately 4,460 l.f. of sewer; removal of approximately 6,440 l.f. of roots and tuberculation; replacement of approximately 230 sewer service laterals; replacement of approximately 115 water services encountered in sewer trench; testing & sealing of approximately 330 sewer lateral connections; grinding of approximately 30 service connections; installing approximately 13,880 l.f. of cured in place pipe lining; cleaning & TV inspection of approximately 30 sewer service laterals; lining of approximately 880 v.f. of manholes; sealing of approximately 10 manhole pipe connections, rebuilding of approximately 50 manhole inverts; frame & cover replacement at approximately 33 manholes; reset frame & cover at approximately 40 manholes; cleaning & inspection of approximately 70 manholes; relocation of water blow-off from sewer manhole; relocation of water main at sewer manhole; removal of approximately 13 sump pumps from the sewer system; and all appurtenances including paving, curbing and earthwork items.

SUMMARY OF PROJECT COSTS

<u>PROJECT DESCRIPTION</u>	<u>TOTAL COST</u>	<u>ELIGIBLE COST</u>
Construction of Sanitary Sewer Rehabilitations in Area 1314A Cedarwood Area (As-Bid)	\$4,317,065.90	\$3,569,000.00
Construction Contingency	\$ 82,934.10	\$ 0.00
TOTAL ESTIMATED PROJECT COST	<u>\$4,400,000.00</u>	<u>\$3,569,000.00</u>

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-35-3-911

CITY OF WALTHAM

**CONSTRUCTION OF "SSO MITIGATION PROJECT – AREA 1314A CEDARWOOD AREA
AND SURROUNDING NEIGHBORHOODS SANITARY SEWER REHABILITATION"**

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction of Sanitary Sewer Rehabilitations in Area 1314A Cedarwood Area	February 2015	September 2015
Warranty & Retesting Period		September 2016

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WEYMOUTH, MASSACHUSETTS
I/I INVESTIGATION & REHABILITATION PROGRAM
MWRA PROJECT NO. WRA-P9-39-3-909**

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 include, but not be limited to, the following:

Town-Wide Sewer Investigation & Rehabilitation Program – Year 4: (Est. Cost = \$186,000)

1. Flow isolate as much as 50,000 LF of sewer in Weymouth Subareas C-3 and D-1-1 to quantify infiltration amounts within manhole-to-manhole segments of sewer. The inspection will be conducted between the hours of 12AM and 6AM when groundwater levels are typically at their highest and sanitary flows are at a minimum.
2. Light clean, TV inspect, videotape and record as much as 54,240 LF of sewer in Weymouth Subareas C-3 / D-1-1 / N-1 / N-7. The TV inspection will be performed to locate problem areas and I/I sources within manhole-to-manhole segments of sewer. The inspection will be conducted in Spring 2015 when groundwater levels are typically at their highest.
3. Conduct topside physical survey of as many as 325 sewer manholes in Weymouth Subareas C-3 / D-1-1 / N-1 / N-7 for defects and I/I sources. A written log will be furnished for each manhole inspected.
4. 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.

2015 Sewer System I/I Rehabilitation – Design/Construction: (Est. Cost = \$590,000)

Project rehabilitation work (as identified in the Spring 2014 I/I Investigation of Subareas C-4 / C-5 / C-6) will include, but not be limited to, the following: Clean/inspect/test and seal 7900 LF of sewer; install short liners at 34 locations; install 1900 LF of CIP pipe; rehabilitate 65 manholes; grout 14 service connections; replace six manhole frames & covers; install 125 manhole inflow dishes; perform 1050 LF of root treatment; and TV inspect 2630 LF of sewer.

Total project cost is estimated at \$776,000. Eligible MWRA I/I Local Financial Assistance is \$776,000. Project work will be performed pursuant to the terms and conditions detailed within the approved MWRA Phase 9 I/I Local Financial Assistance Project Application received January 20, 2015 and the Agreements For Engineering Services By And Between The Town Of Weymouth, Massachusetts And Weston & Sampson Engineers, Inc. As a result of the above work, an estimated 0.18 mgd of peak I/I will be removed from the collection system upon contract completion.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WEYMOUTH, MASSACHUSETTS
I/I INVESTIGATION & REHABILITATION PROGRAM
MWRA PROJECT NO. WRA-P9-39-3-909**

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Town-Wide Sewer Investigation & Rehabilitation Program – Year 4:		
Flow Isolation	March 2015	May 2015
TV Inspection	March 2015	May 2015
Manhole Inspection	March 2015	May 2015
Letter Report	June 2015	November 2015
2015 Sewer System I/I Rehabilitation:		
Design	February 2015	April 2015
Bid and Award	May 2015	May 2015
Construction	July 2015	October 2015

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P9-41-3-910

TOWN OF WINCHESTER

PHASE II SANITARY SEWER EVALUATION SURVEY – METER #1, 2, 6 & LESLIE/LAWSON
SUBAREAS; STOWELL & MARSHALL ROAD SEWER REHABILITATION DESIGN &
CONSTRUCTION

SCOPE OF SERVICES

Phase II Sanitary Sewer Evaluation Survey This Study will identify and quantify sources of Infiltration and Inflow (I/I) in the sanitary sewer system in Meter Areas #1, 2, & 6 and the Leslie/Lawson tributary subarea.

The expected field investigations associated with this project will include, but not be limited to: conducting top side physical survey of as many as 730 sewer manholes for sources of I/I; conducting flow isolation of as many as 116,500 l.f. of sanitary sewer; cleaning and internal TV inspection of as many as 116,500 l.f. of sewer which includes as many as 11,650 l.f. of heavy cleaning; updating of sewer mapping/GIS database; preparing a draft and final report on the results of the field investigations which will include data analysis, cost-effectiveness analysis and recommendations for sewer rehabilitation along with preliminary design concepts.

Stowell & Marshall Road Sewer Rehabilitation Design & Construction This project consists of the design, construction and engineering construction services associated with the Sanitary Sewer Rehabilitation Project in the Stowell Road & Marshall Road area. This sewer rehabilitation project includes the repair of sewer defects and sewer rehabilitations identified in the Stowell and Marshall Road Sewer System Evaluation Report dated January 2014.

The approximate scope of work includes but is not necessarily limited to: open-cut replacement of approximately 65 l.f. of 8" sewer; root treatment of approximately 1,427 l.f. of 8" & 10" sewers and 5 manholes; installation of approximately 2,275 l.f. of 8" & 10" cured-in-place pipe liners; grouting of approximately 29 sewer services; cementitious lining of approximately 109 v.f. of manholes; replacement of 2 manhole frames & covers; building 1 manhole bench & invert; furnishing & installing 1 manhole inflow dish; and all other related tasks and appurtenances including permanent and temporary pavement, police details and mobilization.

PROJECT COST SUMMARY

<u>Description of Task</u>	<u>Estimated Cost</u>
Phase II Sanitary Sewer Evaluation Survey	\$ 395,000
Stowell & Marshall Road Sewer Rehabilitation	
Design	\$ 11,400
Construction	\$ 235,000
Construction Services	\$ 29,600

Total Project Cost	<u>\$ 671,000</u>

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P9-41-3-910

TOWN OF WINCHESTER

PHASE II SANITARY SEWER EVALUATION SURVEY – METER #1, 2, 6 & LESLIE/LAWSON
SUBAREAS; STOWELL & MARSHALL ROAD SEWER REHABILITATION DESIGN &
CONSTRUCTION

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Phase II Sanitary Sewer Evaluation Survey		
Manhole Inspections	March 2015	May 2015
Flow Isolation	March 2015	May 2015
Cleaning & TV Inspection	March 2015	May 2015
Review & Analysis of Data	June 2015	November 2015
Cost Effectiveness &/Preliminary Design	June 2015	November 2015
Final Report Submittal		December 2015
Stowell & Marshall Rd Sewer Rehabilitation		
Design and Bid & Award	February 2015	April 2015
Construction of Sewer Rehabilitations	April 2015	May 2015
Re-Test and Warranty Inspection		Spring 2016

MWRA I/I Local Financial Assistance Program Funding Summary

May 2015 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Arlington	\$ 800,000
Framingham	\$ 871,650
Lexington	\$ 1,305,000
Norwood	\$ 130,000
Wakefield	\$ 232,100
Woburn	\$ 1,464,700
Total	\$ 4,803,450

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-01-3-921

TOWN OF ARLINGTON

CONSTRUCTION OF PHASE #7 SANITARY SEWER REHABILITATIONS

SCOPE OF SERVICES

This sewer rehabilitation project is a result of the I/I sources identified during previous Sewer System Investigation Planning Program (SSIPP) Studies. The sewer rehabilitation work is located in various portions of SSIPP Areas #1 through #8. The sewer rehabilitation contract to be awarded will include the Base Bid and Alternate Bids. One of the Alternate Bids will be associated with storm drain rehabilitations which is not being funded under the MWRA I/I Local Financial Assistance Program. The cost of this Alternate Bid is also not included in the \$800,000 being funded by MWRA.

The sewer rehabilitation work will include an estimated 16,000 linear feet (lf) of cured-in-place pipelining (CIPP) and interior sealing and lining of an estimated 150 manholes along with other traditional sewer rehabilitation techniques such as cutting of protruding service connections; testing & grouting of service connections; reinstating & grouting service connections in cured-in-place pipe; cleaning, inspection, testing & sealing of sewers; root treatment of sewer pipe and manholes; installing short liners; installing new manhole frames & covers; installing manhole inflow dishes and other inflow source removal; and other related tasks.

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

SUMMARY OF PROJECT COSTS

Construction of Phase #7 Sanitary Sewer Rehabilitations	\$ 675,000
Engineering Services During Construction of Phase #7 Sewer Rehabilitations	\$ 125,000
TOTAL ESTIMATED PROJECT COST	----- \$ 800,000

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-01-3-921

TOWN OF ARLINGTON

CONSTRUCTION OF PHASE #7 SANITARY SEWER REHABILITATIONS

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Phase #7 Sanitary Sewer Rehabilitations	June 2015	September 2015
Re-testing & Warranty Inspection	March 2016	May 2016

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF FRAMINGHAM CONTRACT NO. PW 291
MAIN STREET AREA SEWER IMPROVEMENTS
MWRA PROJECT NO. WRA-P9-14-3-920**

SCOPE OF SERVICES

The proposed project includes contracted sewer rehabilitation / replacement in the Main Street area of the Town of Framingham. Much of the existing infrastructure has been in service well beyond its expected design life (sewers in this area were installed between 1924 and 1940) and required above average maintenance attention. Per the Town's 2008 Comprehensive Wastewater Management Plan, this sewer sub-area contributes greater than 4000 gpd/in-mile of infiltration to the collection system.

Work to be performed under this project includes, but is not necessarily limited to: replacement of approximately 1460 linear feet (LF) of 8-inch sewer main; replacement of approximately 450 LF of sewer service laterals; cured-in-place lining of approximately 2750 LF of 8-inch sewer main; replacement of approximately 24 sewer 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 291 (Main Street Area Water And Sewer Improvements) and the approved MWRA Phase 9 I/I Local Financial Assistance Project Application received March 25, 2015.

The project's work area includes: Main Street / Granite Street / Moulton Park Road / Maple Street.

Total project cost is estimated at \$3,328,424. Eligible MWRA I/I Local Financial Assistance is \$871,650 (Rehabilitation Construction = \$709,589 / Construction Administration = \$162,061). As a result of the above work, an estimated 0.05 mgd of peak infiltration will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	September 2014	November 2014
Bid/Award	December 2014	December 2014
Construction	May 2015	July 2016

ATTACHMENT A
 FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P9-17-3-916

TOWN OF LEXINGTON

II INVESTIGATIONS IN PHASE 6 AREA (SEWER BASINS 2, 11 & 13)
 AND
 DESIGN & CONSTRUCTION OF SEWER & MANHOLE REHABILITATIONS IN PHASE 5 AREA
 (SEWER BASINS 4, 5 & 14)

SCOPE OF SERVICES

II Investigations in Phase 6 Area This Study will identify and quantify sources of Infiltration and Inflow (I/I) in the sanitary sewer system in the Phase 6 Area (Sewer Basins 2, 11 & 13). For Sewer Basin 2, the expected field investigations will include, but not be limited to: conducting top side physical survey as many as 280 sewer manholes for sources of I/I; conducting flow isolation of as many as 49,000 l.f. of sanitary sewer; cleaning and internal TV inspection of as many as 49,000 l.f. of sewer; updating of sewer mapping/GIS database; preparing a draft and final report on the results of the field investigations which will include data analysis, cost-effectiveness analysis and recommendations for sewer rehabilitation along with preliminary design concepts. For Sewer Basin 11, the expected field investigations will include, but not be limited to: conducting top side physical survey as many as 410 sewer manholes for sources of I/I; conducting flow isolation of as many as 71,000 l.f. of sanitary sewer; cleaning and internal TV inspection of as many as 71,000 l.f. of sewer; updating of sewer mapping/GIS database; preparing a draft and final report on the results of the field investigations which will include data analysis, cost-effectiveness analysis and recommendations for sewer rehabilitation along with preliminary design concepts. For Sewer Basin 13, the expected field investigations will include, but not be limited to: conducting top side physical survey as many as 460 sewer manholes for sources of I/I; conducting flow isolation of as many as 79,000 l.f. of sanitary sewer; cleaning and internal TV inspection of as many as 79,000 l.f. of sewer; updating of sewer mapping/GIS database; preparing a draft and final report on the results of the field investigations which will include data analysis, cost-effectiveness analysis and recommendations for sewer rehabilitation along with preliminary design concepts.

Design & Construction of Sewer & Manhole Rehabilitations in Phase 5 Area (Sewer Basins 4, 5 & 14) This project consists of the design, bid & award and construction associated with the recommended sewer & manhole rehabilitations. The approximate scope of work includes but is not necessarily limited to: cleaning & TV inspection of as much as 3,000 l.f. of sewer; cleaning, inspecting, testing & sealing of as much as 3,300 l.f. of sewer; cementitious lining of as much as 750 v.f. of manholes; installing 2 watertight manhole frame & cover; installing encapsulation system at 4 manholes; chemical root treatment of as much as 500 l.f. of sewer; installing as much as 90 l.f. of cured-in-place pipe liner; installing as much as 5,100 l.f. of manhole to manhole cured-in-place pipe liner; inspection, testing and sealing of 10 service connections; cutting of 5 protruding service connections; other related tasks and appurtenances.

PROJECT COST SUMMARY

<u>Description of Task</u>	<u>Estimated Cost</u>
I/I Investigations in Phase 6 Area	\$ 628,000
Sewer & Manhole Rehabilitations in Phase 5 Area	
Design	\$ 91,000
Construction	\$ 586,000

Total Project Cost	\$ 1,305,000

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9

**ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-17-3-916

TOWN OF LEXINGTON

I/I INVESTIGATIONS IN PHASE 6 AREA (SEWER BASINS 2, 11 & 13)

AND

**DESIGN & CONSTRUCTION OF SEWER & MANHOLE REHABILITATIONS IN PHASE 5 AREA
(SEWER BASINS 4, 5 & 14)**

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
I/I Investigations in Phase 6 Area		
Manhole Inspections	March 2015	May 2015
Flow Isolation	March 2015	May 2015
Cleaning & TV Inspection	March 2015	May 2015
Review & Analysis of Data	June 2015	October 2015
Final Report Submittal		December 2015
Sewer & Manhole Rehabilitations in Phase 5 Area		
Design and Preparations of Documents	February 2015	May 2015
Bid & Award	June 2015	July 2015
Construction of Sewer Rehabilitations	July 2015	December 2015
Re-Test and Warranty Inspection		Spring 2016

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF NORWOOD, MASSACHUSETTS
SEWER MANHOLE REHABILITATION
MWRA PROJECT NO. WRA-P9-25-3-917**

SCOPE OF SERVICES

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

Sewer rehabilitation work under this project will include construction of three (3) additional underdrain access manholes in portions of the sewer system. These manholes will be used to perform additional sampling to pinpoint future rehabilitation efforts and monitor progress following corrective action. The four-foot precast underdrain access manholes will be located on St. Georges Avenue / Fulton Street / Nichols Street. Construction of the new manholes will be performed by a negotiated change order under the ongoing Hoyle Street Area Sewer Rehabilitation Project funded by MWRA in May 2013 (MWRA Project No. WRA-P8-25-3-814).

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Professional Services By and Between the Town of Norwood and CDM Smith, Inc. and the approved MWRA Phase 9 I/I Local Financial Assistance Project Application received February 6, 2015.

Total project cost is estimated at \$148,100. Eligible MWRA I/I Local Financial Assistance is \$148,100 (Design = \$34,000 / Rehabilitation Construction = \$94,600 / Construction Services = \$19,500). As a result of the above work, an estimated 0.10 mgd of peak I/I will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	March 2015	April 2015
Construction	May 2015	June 2015

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM – PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-33-1-922

TOWN OF WAKEFIELD

**INFILTRATION & INFLOW INVESTIGATIONS IN SEWER SUBAREA 2
AND
POLICE DETAIL COSTS**

SCOPE OF SERVICES

INFILTRATION & INFLOW INVESTIGATIONS IN SEWER SUBAREA 2

The Inflow investigations will consist of: smoke testing of up to 40,000 linear feet of sewer; dyed water testing of up to 10 sites; dyed water flooding of up to 5 sites in conjunction with television inspection of the sanitary sewer. The Infiltration investigations will consist of: flow isolation of up to 40,000 linear feet of 6-inch to 15-inch diameter sewer; topside inspection of as many as 250 sewer manholes; cleaning and television inspection of as much as 40,000 linear feet of sewer.

A detailed letter report will be prepared that will summarize the work completed and include results of the smoke testing, dye water testing and flooding, flow isolation, manhole inspection and television inspection; identify areas that appear to contribute Infiltration & Inflow (I/I); provide preliminary design recommendations, and preliminary construction cost estimates and schedule.

The Report will include recommendation for rehabilitation of those sources of I/I which have been identified and a cost-effectiveness analysis. For those sources of I/I that have been located and quantified, the Report will include a plan and cost estimate for the design phase that will include the preparation bid documents for I/I rehabilitation. An opinion of probable construction cost will also be provided. For those sources of I/I that will require additional investigative work, the report will include a plan and cost estimate to conduct those investigations.

POLICE DETAIL COSTS

The Town incurred police detail costs associated with various recently MWRA funded projects but at the time of the original application, the Town did not include these costs. The Town is now applying for these costs.

ESTIMATED PROJECT COST SUMMARY

<u>Description of Task</u>	<u>Estimated Cost</u>
Infiltration & Inflow Investigations in Sewer Subarea 2	\$ 168,000
Police Detail Costs	\$ 64,100
TOTAL PROJECT COST	\$ 232,100

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM – PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-33-1-922

TOWN OF WAKEFIELD

**INFILTRATION & INFLOW INVESTIGATIONS IN SEWER SUBAREA 2
AND
POLICE DETAIL COSTS**

PROJECT SCHEDULE

<u>General Description of Work Performed</u>	<u>Start Date</u>	<u>Completion Date</u>
Infiltration Investigation	September 2015	November 2015
Inflow Investigation	August 2015	September 2015
Report Preparation	November 2015	February 2016

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 9
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT

PROJECT NO. WRA-P9-43-3-918

CITY OF WOBURN

PROJECT #1 – SEWER INVESTIGATION & EVALUATION IN CIP PROJECT 3 AREA
PROJECT #2 – DESIGN OF RECOMMENDED SEWER REHABILITATIONS IN PROJECT 2 AREA
PROJECT #3 – CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS IN CIP PROJECT 1 AREA

SCOPE OF SERVICES

Project #1 – Sewer Investigation & Evaluation in CIP Project 3 Area This Project will identify sources of infiltration and inflow (I/I) in Sewer Mini-systems ES-18 and ES-20. The field work associated with this project will include, but not be limited to: conducting top side physical survey of approximately 254 sewer manholes for sources of I/I; conducting flow isolation in as much as 48,306 l.f. of sewer; cleaning and internal TV inspection of approximately 48,306 l.f. of sewer; providing as many as 20 hours of heavy cleaning; updating of sewer mapping/GIS database; preparing draft and final report on the results of the field work which will include preliminary design recommendations; design cost and preliminary construction cost estimates and schedule; cost-effectiveness analysis and recommendations for sewer rehabilitation.

Project #2 – Design of Recommended Sewer Rehabilitations in CIP Project 2 Area This project involves the design of the recommended sewer rehabilitations in Sewer Mini-systems ES-01, ES-02, ES-03, ES-04, ES-05 & ES-06. The information collected during the CIP Project 2 Sewer Investigation & Evaluation Study will be used to design cost-effective sewer rehabilitations. Design of manhole and pipeline rehabilitations will include “Excavate and Replace” and “Trenchless” rehabilitation techniques such as root treatment, service connection testing & sealing, service connection lining, short liners, spot repairs, cured-in-place pipelining (CIPP), manhole grouting & sealing. The preparation of Contract Documents and assistance during bidding will also be included.

Project #3 – Construction of Recommended Sewer Rehabilitations in CIP Project 1 Area This project will be performed in Sewer Mini-Systems CS, GA & BR as outlined in the “CIP Project 1 – Sewer Investigation & Evaluation Report (March 2014)”. The scope of work includes but not limited to: various manhole repairs; cementitious lining of manholes; installing manhole inflow dishes; chemical root treatment of sewers & manholes; installing of cured-in-place pipeliners; installing cured-in-place short liners; cleaning, inspection, testing and sealing of sewers; open cut point repairs; cutting protruding service connections; testing & grouting service connections; and other related tasks and appurtenances. This project will also include the engineering services during construction which will include office engineering and resident field engineering services.

PROJECT COST SUMMARY

<u>Description of Task</u>	<u>Estimated Cost</u>
Sewer Investigation & Evaluation in CIP Project 3 Area	\$ 215,000
Design of Recommended Sewer Rehabilitations in CIP Project 2 Area	\$ 99,700
Construction of Recommended Sewer Rehabilitations in CIP Project 1 Area	\$ 950,000
Engineering Services During Construction in CIP Project 1 Area	\$ 200,000

TOTAL ESTIMATED PROJECT COST	<u>\$1,464,700</u>

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM – PHASE 9
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

PROJECT NO. WRA-P9-43-3-918

CITY OF WOBURN

**PROJECT #1 – SEWER INVESTIGATION & EVALUATION IN CIP PROJECT 3 AREA
PROJECT #2 – DESIGN OF RECOMMENDED SEWER REHABILITATIONS IN PROJECT 2 AREA
PROJECT #3 – CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS IN CIP
PROJECT 1 AREA**

PROJECT SCHEDULE

<u>Milestone Description</u>	<u>Start Date</u>	<u>Completion Date</u>
Sewer Investigation & Evaluation in CIPP Project 3 Area	April 2015	December 2015
Design of Recommended Sewer Rehabilitations in CIPP Project 2 Area	June 2015	September 2015
Construction of Recommended Sewer Rehabilitations in CIP Project 1 Area	June 2015	October 2015
Warranty Inspection & Retesting	April 2016	April 2016

ATTACHMENT 5
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY15
Reporting Period: July 2014 Through June 2015

**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 \$460.75 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 FY15, MWRA has distributed \$288 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 FY15. Community information is summarized below:

1. ARLINGTON: North System

Background Information:

- Miles of Sewer: 106
- Sewered Population: 42,857
- Three Year ('12 - '14) Annual Average I/I: 1.72 mgd
- MassDEP Administrative Actions: ACOP-NE-10-1N006 (August, 2010)
NON-NE-09-1N003 (July 2009)
NON-NE-07-1N004 (June 2007)

Latest I/I or SSES Reports:

- “Sewer System Investigation Area #6” Final Report (November 2011)
- “Kimball Road/MWRA Millbrook Valley Relief Sewer Evaluation” Final Report (November 2011)
- “Area #6 Smoke Testing, Dye Testing and Dye Flooding” Final Report (December 2011)
- “Town-wide I/I Analysis” Final Report (April 2012)
- “Additional Inspection of Sewer on Pond Lane, Academy St & Mystic Lake Drive” Letter Report (May 2012)
- “Area #6 (Kimball Road) Building Inspections” Report (January 2013)
- “Sewer system Investigation Area #7” Report (August 2013)
- “Area #4, 5 & 7 Smoke Testing” Report (December 2013)
- “Area #8 Sewer System Investigation” Report (August 2014)

Private Source Inflow Removal Program: No building inspections were conducted over the past year.

I/I Rehabilitation Projects in Design or Construction: Under the Phase #6 Sanitary Sewer Rehabilitations – Bid No. 14-07 which began on June 2, 2014, the following work was completed: 14,000 lf of cleaning; 5 point repairs; replacement of 5 service connections; CIPP lining of approx. 12,000 lf of sewer; installation of 3 short liners; 5,100 lf of root treatment; 1,900 lf of joint testing & sealing; cementitious sealing of 87 manholes; replace/repair of 5 manhole frames and covers. Warranty inspections were completed in May 2015. This project is estimated to remove 132,000 gpd of Infiltration.

Bids were opened on July 1, 2015 for the Phase #7 Sanitary Sewer Rehabilitations – Bid No. 15-25. Insituform was the low bidder and will be performing the work. This project is expected to be substantially complete by January 2016 with warranty inspection completed October 2016.

Reporting Period Activity: The Town is continuing with the 12-year Sewer System Investigation and planning program which was initiated in September 2006.

The Area #8 Sewer System Investigation Report which included sewer investigations in mini-systems 11, 12, 18, 21, 23, 24, 28, 38, B, F, G, N & K was completed in August 2014.

In May 2015, funds were distributed to fund the eligible cost for the “Construction of the Phase 7 Sanitary Sewer Rehabilitations”. This sewer rehabilitation work will include an estimated 16,000 linear feet (lf) of cured-in-place pipelining (CIPP) and interior sealing and lining of an estimated 150 manholes along with other traditional sewer rehabilitation techniques such as cutting of protruding service connections; testing & grouting of service connections; reinstating & grouting service connections in cured-in-place pipe; cleaning, inspection, testing & sealing of sewers; root treatment of sewer pipe and manholes; installing short liners; installing new manhole frames & covers; installing manhole inflow dishes and other inflow source removal; and other related tasks. The estimated Peak Inflow removal is 0.005 mgd and the estimated Peak Infiltration removal is 0.128 mgd. (MWRA Project No. WRA-P9-01-3-921).

MWRA I/I Local Financial Assistance Program: The community has financed Twenty (20) I/I reduction projects through the Authority’s funding assistance program. Of the \$8,423,000 allotted through the Program’s Phases 1 - 10, the community has \$2,010,000 remaining in funding assistance.

2. ASHLAND: South System

Background Information:

- Miles of Sewer: 66
- Sewered Population: 12,743
- Three Year (‘12 - ‘14) Annual Average I/I: 0.37 mgd
- MassDEP Administrative Actions: No. 594 (November 1985)

Latest I/I or SSES Report: I/I Investigation/Repair (Summary Report): March 2012
I/I Investigation/Repair Status Reports: CY13/14
I/I Investigation: TV Inspection (Summary Report): Ongoing

Private Source Inflow Removal Program: Sump pump/roof leader investigations (via DPW personnel) by Sub-Basin during FY14/15:

Sub-Basin 1: 17 inspections	Sub-Basin 2: 34 inspections
Sub-Basin 3: 19 inspections	Sub-Basin 4: 21 inspections

I/I Rehabilitation Projects in Design or Construction: The Town has contracted Truax Corp. to perform internal TV inspection of 199,500 LF of sewer main in Ashland Sewer System Sub-Basins 1 / 2 (MWRA Project No. WRA-P8-02-1-827). As of August 2015, approximately 174,481 LF of sewer main has been investigated. Project work is scheduled for completion Spring 2016. Also, the Town contracted National Water Main to line approximately 1760 LF of 14-inch sewer main and nine sewer service connections on Pleasant Street (MWRA Project No. WRA-P8-02-3-822). Approximately 80,000 gpd of identified peak I/I was removed. In addition, the Town replaced 60 LF of collapsed/misaligned sewer main 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. West Union Street Area Sewer Flow Monitoring completed Fall 2014. 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 seven (7) I/I reduction projects through the Authority’s funding assistance program. Of the \$2,168,500 allotted through the Program’s Phases 1 - 10, the community has \$840,000 remaining in funding assistance.

3. BEDFORD: North System

Background Information:

- Miles of Sewer: 78
- Sewered Population: 12,379
- Three Year ('12 - '14) Annual Average I/I: 1.10 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. Smoke testing which was conducted as part of the Sewer System Investigation Project #3 identified several private Inflow sources. These sources are expected to be removed in an upcoming sewer rehabilitation project.

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 only sewer rehabilitation work conducted over the past year was the HDPE lining of a portion (2,670 lf) of the 20" diameter Great Road sewer pump station force main along Bedford St in Lexington between Westview Cemetery and Eldred St. The next portion of this force main rehabilitation is expected to be completed over the next year.

Reporting Period Activity: The Sewer System Investigation Project #3 is on-going. The completion of the report which was originally expected by Fall 2014 is now expected by August 2015. The majority of this project was conducted in the Page Road Pump Station tributary area and will identify I/I sources.

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 \$3,404,600 allotted through the Program's Phases 1 - 10, the community has \$1,713,000 remaining in funding assistance.

The Town has submitted a Financial Assistance Application for \$308,000 for 2 projects. The first project is the Design, Bid & Award & Construction of the Phase #3 Sewer Manhole Rehabilitations. The second project is the Phase #4 Sewer System Investigations. Funding is scheduled to be distributed during the MWRA August 2015 Distribution Period.

4. BELMONT: North System

Background Information:

- Miles of Sewer: 78
- Sewered Population: 24,537
- Three Year ('12 - '14) Annual Average I/I: 1.13 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report:

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

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

No building inspections were performed during the past year.

I/I Rehabilitation Projects in Design or Construction: CWSRF funded illicit connection mitigation project (CWSRF No. 3711) continued with the completion of lining of approx. 6.26 miles of sewer, replacement/repair of 0.22 miles of sewer, replacement of 49 service laterals, lining of 42 service laterals and replacement/rehabilitation of 13 sewer and storm drain manholes. An estimated 27,300 gpd of infiltration was removed.

Reporting Period Activity: The Contract for the Sewer and Storm Drain Rehabilitation Inflow and Infiltration Removal – (MWRA Project No. WRA-P7-04-3-756) was completed in February 2015. An estimated 215,000 gpd of inflow/infiltration was removed.

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 \$5,135,100 allotted through the Program's Phases 1 - 10, the community has \$2,143,000 remaining in funding assistance.

5. BOSTON: North and South Systems

Background Information:

- Miles of Sewer: 858
- Sewered Population: 645,320
- Three Year ('12 - '14) Annual Average I/I: 30.56 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: City-Wide I/I Analysis (ongoing); West Roxbury Low Level Sewer I/I Study; 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; and Longwood Medical Area I/I Survey.

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 23,350 downspouts have been disconnected. During CY05-CY15, 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-nine (79) projects have received funding through the MWRA I/I Local Financial Assistance Program. During FY07-FY15, BWSC completed the following rehabilitation projects: Mass Ave - Dorchester Separation (New Market Square Area); East Boston (Border/Meridian Street Area) Sewer Separation; Sewer Rehabilitation in Back Bay/ Kenmore/Hyde Park/Mattapan; 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 and Public Garden Lining; Back Street Sewer Separation and Chester Park Area Sewer Separation.

On-going rehabilitation projects include: Mass Ave - Roxbury Separation (New Market Square); Dudley Square Sewer Separation; A Street Area Sewer Separation (South Boston Gillette Headquarters); Rehabilitation of Sewers in the Fenway (Audubon Circle / St. Mary's Street Area) and Hampden Street Area 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 also works cooperatively with Massport to identify impacts from the sewer system to the Logan Airport area stormwater drainage system. Between 2006 and 2008, Massport conducted inspections of the sanitary sewer and stormwater drainage systems to locate sanitary system leaks/breaks and direct/illegal cross-connections to the drainage system. As a result of these surveys, BWSC completed sanitary sewer section replacement during 2009/10. The sanitary sewer inspections also identified deficiencies in the sewer maintained by Massport at several locations throughout the Airport property. In 2012, sewer cleaning and internal TV inspection identified additional sewer sections requiring repair.

Rehabilitation design was completed in July 2013. Rehabilitation construction was completed in November 2013. Work included CIP pipe lining of 1525 LF of sewer main and replacing 240 LF of sewer main. In 2012/3, Massport Facilities Department conducted inspections and cleaning of manholes/catch basins at locations throughout the Airport property. A total of 371 structures were inspected.

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 Commission has financed seventy-nine (79) I/I identification/reduction projects through the Authority's funding assistance program. Of the \$132,171,200 allotted through the Program's Phases 1 - 10, the community has \$48,459,224 remaining in funding assistance.

6. BRAINTREE: South System

Background Information:

- Miles of Sewer: 140
- Sewered Population: 34,910
- Three Year ('12 - '14) Annual Average I/I: 3.12 mgd
- MassDEP Administrative Actions: ACO-NE-01-1001 (April 2001)
ACO-NE-99-1001 (March 1999)
NON (May 1997)
NON (October 1986)
Amended AO Docket No. 546 (February 1985)

Latest I/I or SSES Report: Annual Town-Wide Sewer Investigation & Rehabilitation Program –
Prioritization Evaluation Report (July 2011)
Annual Town-Wide Sewer Program – Yr 1 Investigation (July 2012)
Annual Town-Wide Sewer Program – Yr 2 Investigation (January 2014)
Annual Flow Monitoring Project – Phase I (January 2015)
Annual Town-Wide Sewer Program – Yr 3 Investigation (March 2015)
Annual Town-Wide Sewer Program – Yr 4 Investigation (Ongoing)

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. During CY13/14, a sump pump amnesty letter was sent out with the Town's annual water report to all users. The letter resulted in 31 customer calls to have their connections checked. To date, 27 inspections have taken place, and nine (9) sump pumps have been identified for removal. Actual removal/rerouting of the sump pumps has not yet taken place.

I/I Rehabilitation Projects in Design or Construction: Annual I/I Removal Program (Year 4) investigation in Subareas PS1 / T3 / T4 / T5 (MWRA Project No. WRA-P9-06-3-915) was complete Spring 2015. Data review/report preparation ongoing.

Annual I/I Removal Program (Year 3) performed flow isolation, TV inspection and topside manhole inspections during Spring 2014 (MWRA Project No. WRA-P9-06-3-915). Data review/report preparation complete March 2015. Flow isolation and TV inspection of 43,489 LF of sewers in Subareas U1 / W5 / W6 revealed an estimated 94,176 gpd of peak infiltration. Topside manhole inspection of 236 manholes in Subareas U1 / W5 / W6 revealed an estimated 31,104 gpd of peak infiltration and 1969 gpd of peak inflow.

Annual I/I Removal Program (Year 2) investigation (MWRA Project No. WRA-P8-06-3-812) performed flow isolation, TV inspection and topside manhole inspection during Spring 2013. Data review/report preparation complete January 2014.

Annual I/I Removal Program (Year 1) investigation (MWRA Project No. WRA-P7-06-3-748) performed TV inspection of 49,538 LF of sewer pipe in Subareas S1 / W2 / HC2 / M2 and revealed an estimated 43,632 gpd of peak infiltration. Topside manhole inspection of 230 manholes in Subareas S1 / W2 revealed an estimated 35,795 gpd of peak infiltration.

Reporting Period Activity: Annual Flow Monitoring Project (Phase I) complete January 2015. The FY15 annual flow monitoring project is now ongoing. A report will be provided on an annual basis.

Annual I/I Removal Program (Year 3) design (MWRA Project No. WRA-P9-06-3-915) was completed June 2014. Year 3 Rehabilitation Construction (Braintree Contract S15-1) was bid July 2015 and is scheduled for completion May 2016. The Year 3 project is estimated to remove 55,765 gpd of infiltration from the Town's sewer system.

Annual I/I Removal Program (Year 2) design (MWRA Project No. WRA-P8-06-3-812) was completed May 2014. Year 2 Rehabilitation Construction (Braintree Contract S14-1) was bid July 2014 and is substantially complete. Warranty Retesting work is scheduled for Fall 2015. The Year 2 project is estimated to have removed 32,947 gpd of infiltration from the Town's sewer system.

Annual I/I Removal Program (Year 1) design (MWRA Project No. WRA-P7-06-3-748) was completed May 2013. Year 1 Rehabilitation Construction (Braintree Contract S13-1) was bid June 2013 and completed (warranty retesting) Summer 2014.

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 \$8,359,000 allotted through the Program's Phases 1 - 10, the community has \$3,183,200 remaining in funding assistance.

7. BROOKLINE: North and South Systems

Background Information:

- Miles of Sewer: 111
- Sewered Population: 59,073
- Three Year ('12 - '14) Annual Average I/I: 4.40 mgd
- Mass DEP Administrative Actions: None

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

Latest I/I or SSES Report:

Sewer Evaluation Survey in Subareas NI-7, 8 & 12 Final Report (May 2012)
Results for Condition Survey – Subareas NI-7, NI-8 & NI-12 Technical Memo (August 2012)
Eliot Street Smoke Testing Technical Memo (January 2013)
Englewood Ave/Kilsyth Rd Sewer Alternative Evaluation Technical Memo (February 2013)
Wastewater Master Plan Update (December 2013)
Results for Sewer Condition Survey in Subareas NI-9, NI-10 & NI-11 Technical Memo (September 2014)

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: The construction of the recommended sewer rehabilitations per the I/I investigations conducted in NI-7, 8 and 12 has been completed (Sewer System Rehabilitations – Contract No. PW/12-34) and final payment has been made to the contractor. The construction of the recommended sewer rehabilitations per the sewer investigations conducted on Englewood and Kilsyth Streets has been completed (Various Sewer and Drain Improvements – Contract No. PW/13-14). Final payment has been made to the contractor.

In September 2014, the Draft Contract Documents for Recommended Sewer Rehabilitation in Subareas NI-8, NI-9, NI-10 & NI-11 (Contract #PW/15-10) were submitted to MWRA. The specific rehabilitation consists of: cured-in-place lining of approx. 17,000 lf of 8-inch to 20-inch sewers; open-cut point repairs at 7 locations; lining of approx. 1,300 vf of manholes; reconstruction of 5 manholes. The project has been advertised, with a bid opening date of July 30, 2015. The Town expects construction to begin in August 2015.

Reporting Period Activity: In December 2013, the Town executed an engineering agreement for a Master Plan Summary Update, I/I Investigation and Sewer System Rehabilitation Design in Subareas NI-9, NI-10 & NI-11. The purpose of this project is to update the Master Plan to include the sewer separation and rehabilitation work that has been completed in recent years including CCTV inspection data. Recommendations for the next phase of rehabilitation will be made along with additional investigations which are expected to include flow isolation and additional CCTV inspections of sewers and manhole inspections. The design of the recommendations from this update is also included under this project. In September 2014, the Draft Report "Technical Memorandum – Results for Sewer Condition Survey in Subareas NI-9, NI-10 & NI-11" was submitted to MWRA. The final report is complete.

In November 2014, funds were distributed for the following 2 projects: 1.) Infiltration Investigation In Sewer Subareas NI-9, NI-10 & NI-11 The investigative work involves the nighttime flow isolation of the sewer segments in the subject subareas to identify areas of excessive infiltration and the closed-circuit television inspection (CCTV) of the sewer segments targeted from the results of the flow isolation work. A Technical Memorandum will be prepared which will include an analysis of the flow isolation data; evaluation of the CCTV inspection reports and presents conclusions and recommendations for infiltration removal; 2.) Design & Construction of Recommended Sewer Rehabilitations in Sewer Subareas NI-8, NI-9, NI-10 & NI-11. The design work involves the preparation of biddable Contract Documents based on the recommendations from the Technical Memorandum and previously recommended sewer rehabilitations in Sewer Subarea NI-8 which have not been implemented. The construction of the recommended sewer rehabilitations will be those as presented in the Contract #PW/15-10 Contract Documents. The specific work involves: cured-in-place (CIPP) lining of approximately 17,215 lf of 8-inch to 20-inch diameter sanitary sewers; open-cut point repair at seven (7) locations; epoxy lining approximately 1,300 vf of sewer manholes; reconstructing five (5) manholes bench & inverts; adjusting five (5) manhole frames & covers; replacing seventeen (17) manhole frames & covers; and all appurtenances. This funding distribution project is part of the continuing Capital Improvement Program identified in the 1999 Wastewater Master Plan. Under this project, that Master Plan will be updated to reflect all work completed since 1999. The estimated Peak I/I to be removed is 0.09 mgd. (MWRA Project No. WRA-P9-07-3-907).

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 \$13,165,200 allotted through the Program's Phases 1 - 10, the community has \$5,499,000 remaining in funding assistance.

8. BURLINGTON: North System

Background Information:

- Miles of Sewer: 115
- Sewered Population: 24,507
- Three Year ('11 - '13) Annual Average I/I: 1.16 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)
Project 7 – Evaluate Sewer Flows Based on Water Use & SCADA Pump Station Data Report (Fall 2013)
Project 7 – Evaluation of Localized Flooding Areas Final Report (February 2014)
Project 7 – Building Inspections Final Report (March 2014)
Project 7 – Sewer System Evaluation Survey Final Report (March 2014)

Evaluation of Sewer Flows Based Upon SCADA Pump Station Data & Water Use Data – Project 7 (December 2014)

Private Source Inflow Removal Program: In the past year, developers have redirected 8 private illicit sewer connections and received a sewer bank credit from Mass DEP in the amount of 9,600 gpd. There is an additional 21 properties with illicit connections under construction for redirection.

The current sewer bank balance is 28,961 gpd.

I/I Rehabilitation Projects in Design or Construction: The Town’s sewer rehabilitation project originally scheduled for the Fall of 2014 has been rescheduled for the Fall of 2015. This project is expected to remove an estimated 487,422 gpd of I/I resulting in a sewer bank credit of 121,856 gpd.

The construction of “Gravity Sewer Rehabilitations Downstream of Force Main Discharge Locations” has been completed. The warranty retesting and final inspection was completed in November 2014.

Reporting Period Activity: In December 2014, the Final Report entitled “Evaluation of Sewer Flows Based Upon SCADA Pump Station Data & Water Use Data – Project 7” was issued.

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I reduction projects through the Authority’s funding assistance program. Of the \$5,102,800 allotted through the Program’s Phases 1 - 10, the community has \$1,817,000 remaining in funding assistance.

9. CAMBRIDGE: North System

Background Information:

- Miles of Sewer: 148
- Sewered Population: 105,932
- Three Year (‘11 - ‘13) Annual Average I/I: 5.82 mgd
- Mass DEP 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 Reports:

Phase II: Analysis and Fast Track Design of I/I Rehabilitation Projects (December 2007)
East Cambridge Sewer Capacity Program (January 2013)
Area 4 Infrastructure Improvements and Kendall Square Sewer Assessment (July 2015)

Private Source Inflow Removal Program: As part of the Contract 8A Huron Avenue Project, the contractor has removed inflow from 39 buildings with 32 buildings remaining.

As part of the Concord Avenue Contract 9 Project, the contractor has removed inflow from 17 buildings with 13 buildings remaining.

In 2013, DPW instituted a dedicated budget code within the Capital Budget for I/I offset fees. Per DEP Bureau of Resources Protection 2009 I/I Policy, new development projects that cannot remove 4 gallons of I/I per gallon of new sewer flow is charged a mitigation fee which goes to the fund. The fees collected are used by the DPW to remove I/I at other City projects. This program is continuing.

I/I Rehabilitation Projects in Design or Construction: For the Western Avenue Reconstruction Project, all the below ground structures been installed. A contract has been bid and will soon be awarded to construct the storm water sampling station. Design work has not yet begun to separate sewer and storm water in the remainder of the Western Avenue catchment area.

For the Common Manhole Removal Project Contract No. 7, the last three common manholes in the Contract 7 project have been separated, two on Harvard University property between Linnaean St and Fernald St, and one on Brewer Street at Memorial Drive.

Alexandria Real Estate, which is developing the properties in the Binney Street area, is in the process of separating the sewers on Binney Street between Land Boulevard and Third Street. The installation of 1300 linear feet of new storm drain has been completed. All underground structures have been installed in the public way. Remaining work includes storm drain work on private property. The three bending weirs will be inspected and maintained under the Pump Maintenance contract.

Reporting Period Activity: Remedial Sewer Repair: In the past year, the City's contractor installed 150 feet of new sanitary sewer and 119 linear feet (lf) of new storm drain on Day St replacing existing pipe; installed 33 lf of new sanitary (8") and 33 lf of new storm drain (12") replacing existing pipe; lined 11 lf of sewer and 11 lf of storm drain on Eliot St at Mt Auburn St.; installed 77 lf of new 12" sewer on Mt Auburn St between Hilliard and Gerry St replacing existing pipe; installed 185 lf of new sewer on Portland St replacing existing pipe.

Myrtle & Magnolia Project: The contractor has installed the storm water pump station for the Hovey Street storm water holding tank. The pump station is operational.

CAM004 Contract 8A Huron Avenue: Construction for this project began in 2012. In the past year, the contractor has installed 14 lf of new storm drain and lined 767 lf of existing sewer. All the underground work has been completed. Remaining work includes surface restoration.

CAM004 Contract 8B Huron Avenue: Construction for this project began in 2013. In the past year, the contractor has installed 4584 lf of new sewer and 3383 lf of new storm drain and lined 136 lf of existing sewer. The contractor has removed 16 illicit connections and separated 9 common manholes. The underground portion is expected to be completed by December 2015 with surface restoration continuing in CY 2016.

CAM 004 Contract 9 Concord Avenue: Construction for this project began in 2014. In the past year, the contractor has installed 5,524 lf of new sewer and 8604 lf of new storm drain; removed 38 illicit connections and separated 2 common manholes. The underground portion is expected to be completed by December 2015 with surface restoration continuing in CY 2016.

New Street Concord Lane: A project has been bid and awarded to remove 9 common manholes on Concord Lane and to make improvements to the New Street pump station.

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 \$23,620,100 allotted through the Program's Phases 1 - 10, the community has \$12,543,045 remaining in funding assistance.

10. CANTON: South System

Background Information:

- Miles of Sewer: 62
- Sewered Population: 14,459
- Three Year ('12 - '14) Annual Average I/I: 1.34 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)
I/I Five Year Management Plan Update (Ongoing)

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

I/I Rehabilitation Projects in Design or Construction: Sewer System Rehabilitation (Canton Contract No. 12-01S / MWRA Project No. WRA-P8-10-3-817) began July 2013. Project work included sewer manhole sealing/restoration,

sewer pipe testing and sealing, CIPP lining and joint testing/sealing in various sewer subsystems throughout the Town. Project work substantially complete July 2014. Final payment application and project closeout is currently ongoing.

Reporting Period Activity: Sealed 25 manholes in various locations (ten cross country manholes were sealed along Route 138). Work performed September/October 2014. Estimated average I/I removal is 44,000 gpd.

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

MWRA I/I Local Financial Assistance Program: The community has financed six (6) I/I reduction projects through the Authority's funding assistance program. Of the \$3,965,900 allotted through the Program's Phases 1 - 10, the community has \$1,290,000 remaining in funding assistance.

11. CHELSEA: North System

Background Information:

- Miles of Sewer: 41
- Sewered Population: 35,649
- Three Year ('12 - '14) Annual Average I/I: 2.00 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 2009)
Everett, Spruce & Second St Sewer & Drain Evaluation (October 2012)

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

I/I Rehabilitation Projects in Design or Construction: Construction of the One North Utility Improvements project is complete. The project included upgrades to utilities on Heard and Sixth Streets between Maple and Spruce, Maple Street from Heard to Sixth, and on Spruce Street between Blossom and the Sixth Street. This included comprehensive sewer separation throughout the project area (approx. 1100 feet of sewer and 2000 feet of drain).

Design for the Broadway Infrastructure Project is ongoing and a Roadway Safety Audit is currently being completed due to the high incidence of vehicle, bike, and pedestrian incidents in the corridor. The project was submitted to the MassDOT Transportation Improvement Program (TIP) for funding; therefore, final design and construction of the project may not begin for several years.

Construction on the Spruce, Beech & Carter St Infrastructure Improvement Project is ongoing; completion is anticipated summer 2015. Under this project, the City completed construction of approximately 500 feet of new sewer and 250 feet of new storm drain on Spruce Street between Everett Avenue and Sixth Street, including jacking under the MBCR rail line, to allow separation of the combined sewer into a sanitary sewer and storm drain. The project also included 650 feet of new drain in Beech Street, between Spruce Street and Carter Street to complete sewer separation in the Beech/Maple area.

Construction of the Lash, Gardner, and John Utility & Roadway Improvements project is complete. The project included comprehensive infrastructure improvements the full length of Lash Street and John Street, and on Gardner between John and Parker. Sewer/drain improvements included replacement of approximately 1050 feet of aging sewer pipe and installation of approximately 780 feet of new drain.

Construction of the [Lower] Broadway, Clyde Street, & Garfield Avenue Utility Improvements is ongoing; completion is anticipated fall 2015. This project consisted of installation of approximately 975 feet of new drain line to allow sewer separation on the lower portion of Broadway, between Beacon and Medford Streets. It also included permanent closure of Combined Sewer Overflow CHE002.

Public bidding for the Phase IV Gateway Center Infrastructure Improvements project is complete; construction is expected to begin July 2015. This project involves utility improvements on Everett Avenue, Carter Street, Blossom Street, Maple Street, Heard Street, and Bryson Road. Sewer/drain improvements include approximately 1300 linear feet of sewer lining, and 1900 linear feet of new drain and 1300 linear feet of new sewer to complete sewer separation throughout the project area.

Public bidding for the Gardner Street and Forsyth Street Utility and Roadway Improvements project is complete; construction is expected to begin summer 2015. This project consists of infrastructure improvements on Gardner Street from Parker Street to Washington Avenue, and on Forsyth Street from Lafayette Avenue to Washington Avenue. Sewer/drain improvements include approximately 960 feet of new drain and approximately 925 feet of sewer replacement to complete sewer separation.

Reporting Period Activity: During the past year, point repairs to the sewer were completed at 12 locations throughout the City.

During the past year, cleaning & TV inspection was conducted on 28,695 lf of sewer and 3,211 lf of storm drain.

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 \$6,870,100 allotted through the Program's Phases 1 - 10, the community has \$2,638,000 remaining in funding assistance.

12. DEDHAM: South System

Background Information:

- Miles of Sewer: 95
- Sewered Population: 23,650
- Three Year ('12 - '14) Annual Average I/I: 1.59 mgd
- MassDEP Administrative Actions: AO Docket No. 547 (October 1985)

Latest I/I or SSES Report: Town-Wide Flow Monitoring (October 2011)
Municipal Building Inspections (October 2012)
2012 Inflow Investigation (February 2013)
I/I Investigation & Rehabilitation Annual Program (February 2013)
2013 Year One Inflow Investigation (March 2014)
2014 Smoke Testing Program (March 2015)

Private Source Inflow Removal Program: The Town adopted a sewer system enterprise fund at the May 2009 Town Meeting. A Municipal Buildings Inspection Program was undertaken to identify inflow sources. Inspections identified approximately 1200 GPD of peak inflow. The Town removed the 1200 GPD of peak inflow during CY13-15.

Weston & Sampson was contracted to conduct smoke testing on approximately 140,000 LF of sewer to identify potential inflow sources. Testing results indicated 27 inflow sources contributing approximately 78,231 GPD of peak design storm inflow. Of the 27 defects identified, six were located within the Town's ROW. These six defects were rehabilitated by the Town's DPW in CY14/5.

Weston & Sampson was contracted to conduct additional smoke testing on approximately 195,000 LF of sewer to identify potential inflow sources. This round of smoke testing finished the remainder of the Town's sewer system. Testing results indicated 33 inflow sources contributing approximately 66,111 gpd of peak design storm inflow. Of the 33 defects identified, 12 were located within the Town's ROW. These 12 defects are scheduled for rehabilitation in Summer 2015.

Weston & Sampson was also contracted to conduct Private Building Inspections within three of the Town's seven precincts. This program was promoted throughout the community as a voluntary. The Town provided penalty amnesty to all residents/commercial property owners who participated. There were 3581 locations within the three precincts. Only 1510 property owners (42%) permitted inspections. Of the 1510 inspections performed, fifty-seven (57) direct and one (1) indirect inflow sources were observed (contributing 418,951 gpd of estimated peak inflow). These sources consisted of thirty-seven (37) sump pumps, one (1) floor drain, nine (9) interior open cleanouts, four (4) exterior open cleanouts, five (5) direct driveway drains, one (1) indirect driveway drain and one (1) roof leader. Due to low program participation, the

Town is not going to perform private building inspections within the remaining four precincts at this time. The Town is currently working on how best to revamp the program for better participation and reviewing the collected data for removal alternatives for the sources identified.

I/I Rehabilitation Projects in Design or Construction: The Town, as part of the 2015 Sewer Rehabilitation On-Call Services Project (MWRA Project No. WRA-P9-12-3-908), completed the installation of 16,678 LF of CIPP lining. The Town anticipates the installation of an additional 4500 LF of CIPP lining, 150 LF of short liners, 100 VF of cementitious manhole lining and 40 lateral liners. The project will remove an estimated 0.46 mgd of peak infiltration.

The community also continued its annual sewer system inspection program. In March 2015, the Town began cleaning and TV inspecting 130,000 LF of sewer main and inspecting 500 sewer manholes. The Town plans to utilize this data, along with previous year's backlog work, to perform CY16 rehabilitation on the most cost-effective sewer lines/manholes utilizing an on-call rehabilitation contract.

Reporting Period Activity: Approximately 475 LF of sewer main extensions were installed throughout the Town by private developers. Upon completion of the extension projects, the Town took over ownership of the sewer mains.

MWRA I/I Local Financial Assistance Program: The community has financed fourteen (14) I/I reduction projects through the Authority's funding assistance program. Of the \$5,740,000 allotted through the Program's Phases 1 - 10, the community has \$913,000 remaining in funding assistance.

13. EVERETT: North System

Background Information:

- Miles of Sewer: 57
- Sewered Population: 42,101
- Three Year ('12 - '14) Annual Average I/I: 1.53 mgd
- MassDEP Administrative Actions: ACOP-NE-08-1N006 (July 2008)
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-026 (August 2009)

Latest I/I or SSES Report:

Sanitary Sewer Overflow Abatement Plan – Behan & Beacham Street Area Final Report (December 2009)
I/I Investigation (July 2010)
Sanitary Sewer/Drain Investigation on Beacham Street (August 2012)

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

The developer for the Air Force Road expansion 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: Design of the Henderson Street & Otis Sewer Replacement was completed and bid. The contract was awarded to GTA for the amount of \$318,412.15. The work has not started because of the need to replace the gas main.

Design of the Fremont Street Combined Sewer Separation Project has been completed and is awaiting approval to bid.

Reporting Period Activity:

For the Stormwater and Wastewater Integrated Plan Project, Beta Group is working with the city on gathering all necessary information on past and present investigations of the city infrastructure and outfalls.

For the IDDE Study Project, BETA Group has gathered and mapped all information. Implementation measures to resolve illicit discharges were identified. Further discussions with city officials on proposed best management practices for stormwater management are expected.

Heavy cleaning of sewers was conducted on Kelvin Street and Tileston Street.

Repair of collapsed sewers were performed on Cedar Street, Chestnut Street & Bennett Street.

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 \$8,071,500 allotted through the Program's Phases 1 - 10, the community has \$4,930,000 remaining in funding assistance.

14. FRAMINGHAM: South System

Background Information:

- Miles of Sewer: 275
- Sewered Population: 62,092
- Three Year ('12 - '14) Annual Average I/I: 2.31 mgd
- MassDEP Administrative Actions: ACO-NE-07-1N001 (March 2007)
AO Docket No. 592 (January 1986)

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

Private Source Inflow Removal Program: The Town's ten year capital plan now includes three phases of inflow removal projects. The first phase is scheduled for funding in the FY17 budget cycle. The Town is currently developing capital projects that will incorporate the removal of the illicit connections identified during the field reconnaissance efforts of the SSES programs. The capital project program will include the redirection of illicit flows as well as the extension of storm drain systems to remove flow from the sewer system. During this year's capital project development cycle, the Town will determine the proposed rehabilitation areas and improvements required in order to further refine the costs and timing of the actual inflow removal projects. The Town has begun drafting the scope of work for this first phase of projects.

I/I Rehabilitation Projects in Design or Construction: The Main Street Area Sewer Improvements Project (Contract PW 291 / MWRA Project No. WRA-P9-14-3-920) is ongoing. Sewer rehabilitation work is scheduled for completion Summer 2016. Project work includes the replacement of approximately 1460 LF of 8-inch sewer main; replacement of approximately 450 LF of sewer service laterals; CIPP lining of approximately 2750 LF of 8-inch sewer main and the replacement of approximately 24 sewer manholes. The project's work area includes: Main Street / Granite Street / Moulton Park Road / Maple Street.

The Central Street Siphon / Sudbury River Interceptor Project consisted of CIPP 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 had generated a seasonal sanitary sewer overflow. Project work is complete.

Reporting Period Activity: The existing gravity sewer on Bethany Road was replaced with a PVC sewer between Waverly Street and Winthrop Street as part of a project to improve the water/sewer infrastructure in this area. The Town also completed the Winthrop/Waverly sewer re-alignment project. This project re-routed a portion of gravity sewer, which had run beneath a building on private property, to a new location in the right-of-way through formalized easements. Also, the Speen Street Force Main was removed from service in late 2014. The majority of users associated with this force main had been re-routed in 2013 as part of the East Framingham Sewer Improvements Project. In 2014, the last three users (Natick properties) were removed from the force main when flows were re-routed to connect to the Natick collection system.

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 \$12,125,000 allotted through the Program's Phases 1 - 10, the community has \$6,250,350 remaining in funding assistance.

15. HINGHAM: South System

Background Information:

- Miles of Sewer: 33
- Sewered Population: 6,652
- Three Year ('12 - '14) Annual Average I/I: 0.74 mgd
- MassDEP Administrative Actions: AO Docket No. 536 (November 1985)

Latest I/I or SSES Report: Comprehensive Wastewater Management Study (August 2010)

I/I Investigations Letter Report (June 2012)

FY14 I/I Evaluation (January 2014)

FY15 I/I Evaluation (April 2104)

FY 15 Evaluation Amendment 1 (November 2014)

FY 16 Evaluation (Ongoing 2015)

2015 Town-Wide Flow Metering (Ongoing 2015)

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

I/I Rehabilitation Projects in Design or Construction:

Beach Manhole Rehabilitation: Rehabilitation of nine manholes within the Kimball / Foley / Bel Air Beach area. Project work (MWRA Project No. WRA-P8-15-3-828) completed November 2014.

2013 I/I Rehabilitation: Replacement of 350 LF of sewer and 14 lateral connections. Project work (MWRA Project No. WRA-P8-15-3-828) is complete.

FY14 Annual Sewer Program: Review TV inspection videos of approximately 10,000 LF of sewer main. Conduct topside physical survey of 60 sewer manholes. Identified sewer main/manhole defects to be repaired as part of On-Call I/I Rehabilitation Services Contract. FY14 Sewer System I/I Investigation (MWRA Project No. WRA-P8-15-3-828) completed December 2013. FY14 Rehabilitation Construction (MWRA Project No. WRA-P8-15-3-828) completed August 2014.

FY15 Annual Sewer Program: Review TV inspection videos of approximately 11,500 LF of sewer main. Conduct topside physical survey of 65 sewer manholes. Identified sewer main/manhole defects to be repaired as part of On-Call I/I Rehabilitation Services Contract. FY15 Sewer System I/I Investigation (MWRA Project No. WRA-P8-15-3-828) completed Spring 2014. FY15 Rehabilitation Construction (MWRA Project No. WRA-P9-15-3-913) to be completed Summer 2015.

FY16 Annual Sewer Program: Review TV inspection videos of approximately 27,000 LF of sewer main. Conduct topside physical survey of 174 sewer manholes. Identified sewer main/manhole defects to be repaired as part of On-Call I/I Rehabilitation Services Contract. FY16 Sewer System I/I Investigation (MWRA Project No. WRA-P9-15-3-913) is ongoing.

Town-Wide Wastewater Flow Monitoring Program: Flow monitoring work at eight pump stations and four manholes (MWRA Project No. WRA-P9-15-3-913) is ongoing.

Reporting Period Activity: Ship Street and Street Sewer Extensions are ongoing (total length of extension is approximately 1800 LF of PVC sewer pipe). Eighty (80) LF of low pressure force main was installed on Alden Road.

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 \$1,623,500 allotted through the Program's Phases 1 - 10, the community has \$300,000 remaining in funding assistance.

16. HOLBROOK: South System

Background Information:

- Miles of Sewer: 31
- Sewered Population: 9,557
- Three Year ('12 - '14) Annual Average I/I: 0.35 mgd
- MassDEP Administrative Actions: ACO-NE-04-1001
(Signed January 2005; Amended July 2007)
(Amended ACO No. 2 May 2008)

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

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

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

Reporting Period Activity: The Town has completed its yearly check of all cross-country sewer manholes. Phase 3/4 properties associated with collection system expansion are now being connected at owner's request. Phase 5 System Extension (Spring Street Area) and Spring Street Pump Station work is ongoing. Plymouth Street System Extension under construction. Abington Avenue sewer work complete. Juniper Road drainage improvements project completed June 2014.

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 \$1,639,600 allotted through the Program's Phases 1 - 10, the community has \$743,038 remaining in funding assistance.

17. LEXINGTON: North System

Background Information:

- Miles of Sewer: 170
- Sewered Population: 30,557
- Three Year ('12 - '14) Annual Average I/I: 2.46 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)
Sewer System Evaluation Survey Phase 4: Sewer Basins 3 & 9 (May 2013)
Sewer System Evaluation Survey – Manhole Inspections in Sewer Basin 14 (August 2013)
Sewer system Evaluation Survey – Phase 5 Sewer Basins 4, 5 & 14 Draft (May 2015)

Private Source Inflow Removal Program: The Town is using the February 2012 *Lexington 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.

A private inflow program from the February 2012 Private Inflow Removal Program Letter Report is currently on hold.

I/I Rehabilitation Projects in Design or Construction: Contract No. 14-40 was awarded to New England Pipe Cleaning in May 2014. Construction which included: 300 lf of sewer replacement; 21,000 lf of cleaning & inspection; 7,000 lf of joint testing & sealing; rehabilitation of 100 manholes; 260 lf of root treatment; and 6,800 lf of cured-in-place pipe

lining, has been completed. This project is estimated to have removed approximately 100,000 gpd of peak I/I. Warranty inspection and retesting will be completed during the next high groundwater period.

Reporting Period Activity: The draft Sewer System Evaluation Survey for Sewer Basins 4, 5 & 14 was completed in May 2015. This project identified approximately 101,000 gpd of removable peak I/I that is associated with the approximately 139,000 linear feet in these three sewer basins. A design of the sewer rehabilitations has begun.

In May 2015, funds were distributed for the following 2 projects: 1.) I/I Investigations in Phase 6 Area This Study will identify and quantify sources of Infiltration and Inflow (I/I) in the sanitary sewer system in the Phase 6 Area (Sewer Basins 2, 11 & 13). For Sewer Basin 2, the expected field investigations will include, but not be limited to: conducting top side physical survey as many as 280 sewer manholes for sources of I/I; conducting flow isolation of as many as 49,000 l.f. of sanitary sewer; cleaning and internal TV inspection of as many as 49,000 l.f. of sewer; updating of sewer mapping/GIS database; preparing a draft and final report on the results of the field investigations. For Sewer Basin 11, the expected field investigations will include, but not be limited to: conducting top side physical survey as many as 410 sewer manholes for sources of I/I; conducting flow isolation of as many as 71,000 l.f. of sanitary sewer; cleaning and internal TV inspection of as many as 71,000 l.f. of sewer; updating of sewer mapping/GIS database; preparing a draft and final report on the results of the field investigations. For Sewer Basin 13, the expected field investigations will include ,but not be limited to: conducting top side physical survey as many as 460 sewer manholes for sources of I/I; conducting flow isolation of as many as 79,000 l.f. of sanitary sewer; cleaning and internal TV inspection of as many as 79,000 l.f. of sewer; updating of sewer mapping/GIS database; preparing a draft and final report on the results of the field investigations; 2.) Design & Construction of Sewer & Manhole Rehabilitations in Phase 5 Area (Sewer Basins 4, 5 & 14) This project consists of the design, bid & award and construction associated with the recommended sewer & manhole rehabilitations. The approximate scope of work includes but is not necessarily limited to: cleaning & TV inspection of as much as 3,000 l.f. of sewer; cleaning, inspecting, testing & sealing of as much as 3,300 l.f. of sewer; cementitious lining of as much as 750 v.f. of manholes; installing 2 watertight manhole frame & cover; installing encapsulation system at 4 manholes; chemical root treatment of as much as 500 l.f. of sewer; installing as much as 90 l.f. of cured-in-place pipe liner; installing as much as 5,100 l.f. of manhole to manhole cured-in-place pipe liner; inspection, testing and sealing of 10 service connections; cutting of 5 protruding service connections; other related tasks and appurtenances. The estimated annual infiltration removal is 0.046 mgd. (MWRA Project No. WRA-P9-17-3-916).

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 \$7,445,300 allotted through the Program's Phases 1 - 10, the community has \$1,305,000 remaining in funding assistance.

The Town has submitted a Financial Assistance Application for \$1,305,000 for 2 projects. The first project is the Design & Construction of Sewer & Manhole Rehabilitations in Phase 5 Area (Sewer Basins 4, 5 & 14). The second project is the I/I Investigations in Phase 6 Area. Funding is scheduled to be distributed during the MWRA August 2015 Distribution Period.

18. MALDEN: North System

Background Information:

- Miles of Sewer: 100
- Sewered Population: 60,011
- Three Year ('12 - '14) Annual Average I/I: 3.37 mgd
- MassDEP Administrative Actions: None
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-002 (January 2009)

Latest I/I or SSES Report:

Malden Sewer System Evaluation Survey (Phase III) Final Report (December 2011)
Hydraulic Model and Capacity Assessment Draft Report (June 2012)
Hydraulic Model and Capacity Assessment Final Report (December 2012)

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

I/I Rehabilitation Projects in Design or Construction: The sewer rehabilitation work under Contract #2014-S-1, which was awarded to National Water Main Cleaning Co. in February 2014, is now complete and resulted in the following sewers

being cleaned, TVed and rehabilitated via cured-in-place pipe lining (CIPPL) and grouting of sewer service laterals: 29,000 lf of 8-inch, 6,440 lf of 10-inch, 3,000 lf of 12-inch, 781 lf of 15-inch, 618 lf of 18-inch & 144 lf of 24-inch. Sewer manholes were also rehabilitated by lining of 2,700 lf (approx. 335 manholes). An additional 30,000 lf of sewer received heavy cleaning. Sewer manhole frames & covers were replaced at 56 structures. Approximately 900 sewer service laterals were grouted at the interface with the sewer main. The estimated I/I removal is 250,000 gpd.

Reporting Period Activity: No other activities.

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 \$12,283,900 allotted through the Program's Phases 1 - 10, the community has \$7,690,000 remaining in funding assistance.

19. MEDFORD: North System

Background Information:

- Miles of Sewer: 113
- Sewered Population: 56,681
- Three Year ('12 - '14) Annual Average I/I: 2.97 mgd
- MassDEP Administrative Actions: NON-NE-00-1005
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-027 (August 2009)

Latest I/I or SSES Report:

Limited Sewer System Evaluation Survey of North Medford/Heights Area Final Report (July 2012)
Mini-System "P" Sewer System Evaluation Survey Study Final Report (June 2014)

Private Source Inflow Removal Program: The Mini-System "P" Study targeted 180 homes for inspection. Over 900 letters were mailed to residences in the area. Wright-Pierce and their sub-contractor, Stacey DePasquale Engineering, were able to gain access to 106 homes within the study area. The study has been finalized. No follow-up activities have been scheduled at this time. A City-wide policy to disconnect sump pumps is being developed as part of the follow-up activities.

The City is currently working with a property owner in mini-system D to remove inflow sources from their property into the sewer system.

I/I Rehabilitation Projects in Design or Construction: The sewer rehabilitation contract developed as a result of the "Limited Sewer System Evaluation Survey of North Medford/Heights Area" Final Report has been awarded and construction is ongoing. To date the following sewer rehabilitation work has been completed: cured-in-place pipe lining of 1,259 lf of 8-inch sewer and 262 lf of 12-inch sewer; replaced 366 lf of 8-inch sewer and 13 service lines in 2 locations; Replaced 12 vented/damaged manhole covers with solid covers

Two developers replaced six other vented/damaged manholes as part of their projects (1 @ Navarro Circle, from report, & 5 on Locust Street, mini-system F).

A design contract is underway to disconnect 6 catch basins in mini-system N as recommended in the SSES report. Bidding and construction are anticipated in late 2015.

Further study in the mini-system is planned and should start later this year.

Reporting Period Activity: The Sewer Mini System "P" sewer investigation and evaluation study final report is completed and was delivered in June 2014. Two point repairs noted in the report have been completed. The City is planning to release a contract similar to the current Sewer System Rehabilitation Contract to address the problems found during the study. Further study into the remaining areas of the mini-system is also planned.

Further study in the North Medford/Heights Area mini-system is planned and should start later this year.

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 \$11,987,600 allotted through the Program's Phases 1 - 10, the community has \$7,193,000 remaining in funding assistance.

The City has submitted a Financial Assistance Application for \$2,120,000 for the 5 following projects: #1) Sewer System Rehabilitation Program Ongoing 3 Year Contract; #2) North Medford Sewer System Evaluation Survey (SSES) – Phase 2; #3) Removal of Catch Basin Inflow in North Medford; #4) Mini-System P (Daly Road Area) SSES – Phase 2 & Design, Bidding of Sewer Rehabilitations; #5) Engineer Intern Services during Study, Design and Construction Inspection. Funding is scheduled to be distributed during the MWRA August 2015 Distribution Period.

20. MELROSE: North System

Background Information:

- Miles of Sewer: 74
- Sewered Population: 27,236
- Three Year ('12 - '14) Annual Average I/I: 2.34 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report:

I/I Rehabilitation Project Recommendations (November 2001)
Summary Letter Report for Sewer System Investigations - Subareas 21 & 22 (May 2014)
Summary Letter Report for Sewer System Investigations & Mapping (August 2014)

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

I/I Rehabilitation Projects in Design or Construction: The Notice to Proceed for the "Subareas 21 & 22 – Sewer Rehabilitation Project" was issued on July 7, 2014 with completion expected in the Summer 2015. To date, 34,535 linear feet of 6" to 15" sewers were cleaned and TV inspected. The estimated I/I removal for this project is 0.125 mgd annually.

The installation of a short liner to seal an abandoned service connection at the Melrose Library should be completed in August 2015.

Reporting Period Activity: The City of Melrose has continued to retain Pioneer Consulting Group, Inc. to review the current water and sewer rate structure and recommend improvements. As recommended, the City adopted a tiered rate structure for water and sewer billing. The tiered structure is anticipated to result in FY2016 budgeted reserves of approximately \$150,000.

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 \$6,076,300 allotted through the Program's Phases 1 - 10, the community has \$2,162,000 remaining in funding assistance.

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

Background Information:

- Miles of Sewer: 83
- Sewered Population: 25,279
- Three Year ('12 - '14) Annual Average I/I: 1.54 mgd
- MassDEP Administrative Actions: Amended AO Docket No. 580 (March 1986)

Latest I/I or SSES Report: I/I Town-Wide Sewer Evaluation – Year 8 (January 2013)
I/I Town-Wide Sewer Evaluation – Year 9 (September 2013)
I/I Town-Wide Sewer Evaluation – Year 10 (February 2015)
I/I Town-Wide Sewer Evaluation – Year 11 (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). Also, a building inspection is performed during the final water meter reading when a house is being sold. If the building inspection identifies an illegally connected sump pump, a fine is issued and the house cannot be sold until the sump pump has been rerouted and inspected.

I/I Rehabilitation Projects in Design or Construction:

Year 10 Sewer System Infiltration Rehabilitation has been awarded and construction is set to begin Summer 2015. It is estimated that the Year 10 project will remove 73,296 gpd of infiltration from the Town's sewer system. Year 10 I/I Rehabilitation Investigation completed February 2015. TV inspection of 41,449 LF of sewer in Subareas G-08B, G-13 and G-25 revealed an estimated 130,320 gpd of peak infiltration. Topside manhole inspection of 205 manholes in Subareas G-08B, G-13 and G-25 revealed an estimated 37,152 gpd of peak infiltration.

Year 9 Sewer System Infiltration Rehabilitation is substantially complete. Warranty retest work is scheduled for Fall 2015. The Year 9 project is estimated to have removed 50,760 gpd of infiltration from the Town's sewer system. Year 9 I/I Rehabilitation Investigation completed September 2013. TV inspection of 50,550 LF of sewer in Subareas G-11A, G-11C, G-12B, G-12E, G-18, G-21, G-23, G-24, NI-13, NI-21 and S-15 revealed an estimated 94,752 gpd of peak infiltration. Topside manhole inspection of 259 manholes in Subareas G-11A, G-11C, G-12B, G-12E, G-18, G-21, G-23, G-24, NI-13, NI-21 and S-15 revealed an estimated 25,056 gpd of peak infiltration.

Year 8 Sewer System Infiltration Rehabilitation completed April 2014. Year 8 I/I Rehabilitation Design completed April 2013. Year 8 I/I Rehabilitation Investigation completed January 2013.

Reporting Period Activity: Year 11 I/I Rehabilitation Investigation completed Spring 2015. Data review/report preparation is ongoing. Year 10 I/I Rehabilitation Investigation completed February 2015. Also, approximately 830 LF of 8-inch PVC gravity sewer main and nine (9) new sewer connections have been installed to the existing sewer system.

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 \$5,564,500 allotted through the Program's Phases 1 - 10, the community has \$2,313,000 remaining in funding assistance.

22. NATICK: South System

Background Information:

- Miles of Sewer: 135
- Sewered Population: 29,481
- Three Year ('12 - '14) Annual Average I/I: 1.13 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: The Three Year Sewer Rehabilitation Project (Natick Contract No. S-127 / MWRA Project Nos. WRA-P7-22-3-761/825) was bid June 2013. Rehabilitation Construction began October 2013 with completion of identified rehabilitation work estimated to be Winter 2015/6. The contractor is under contract through August 2016 and will be available to rehabilitate any additional sewer defects found during that time frame. The peak infiltration estimated to be removed is 0.61 MGD.

Additional sewer rehabilitation work includes service lateral CIPP lining and CCTV inspection (MWRA Project No. WRA-P9-22-3-912). The lateral lining will be completed under above Contract S-127. Service lateral CIPP lining began July 2015 and is scheduled to be complete April 2016. The CCTV inspection work was originally scheduled to be completed Spring 2015 but has been delayed due to a lack of received contractor proposals. CCTV Inspection work will be delayed until Spring 2016.

Reporting Period Activity: Hunters Hill Subdivision (11 homes): All 11 homes in this phase have tied in; Hunters Hill Subdivision (Phase II): This is a new second phase (12 single family homes) connected to the previously submitted Hunters Hill Subdivision. A sewer extension of 1031 LF of 8-inch PVC gravity sewer was installed in 2014. All 12 homes in this phase have tied in; Heavey Estates (4 homes): No homes have yet to tie in; Cider Mill Estates: A sewer extension of 1462 LF of 8-inch PVC gravity sewer has been constructed. Five new homes have been connected. Six stubs were left for existing homes on Rockland Street. Only two Rockland Street homes have connected to date; Mill Creek Development (82 North Main Street): This past year, 700 LF of 8-inch PVC gravity sewer was installed for seven building connections, consisting of three apartment buildings, three townhouse buildings (12 townhomes total) and the Clubhouse. There are approximately 150 units within these structures. All seven buildings have connected to the sewer, but only two building connections, equivalent to seven townhomes, are live.

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 \$5,582,600 allotted through the Program's Phases 1 - 10, the community has \$1,129,800 remaining in funding assistance.

23. NEEDHAM: South System

Background Information:

- Miles of Sewer: 132
- Sewered Population: 28,152
- Three Year ('12 - '14) Annual Average I/I: 1.27 mgd
- MassDEP Administrative Actions: AO Docket No. 549 (November 1984)

Latest I/I or SSES Report: Sewer Infiltration Investigation for Subareas 16 and Lower 22 - Phase 2 Report (August 2011)
I/I Investigation (October 2013)
I/I Sewer Rehabilitation Assessment Project (January 2013)
Town-Wide Infiltration/Inflow Report (October 2013)
Town-Wide Infiltration/Inflow Report (June 2015)
Reservoir B Tributary Investigation (July 2015)
Phase II I/I Investigation Report (Ongoing)

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

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

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

Reporting Period Activity: 2014 Sewer Rehabilitation in Various Areas construction contract bid January 2015 (an estimated 14,320 gpd of peak infiltration will be removed). Project work is ongoing. I/I Removal 2016 - Various Areas construction contract bid July 2015 (an estimated 49,620 gpd of peak infiltration will be removed). Town-Wide TV inspection of 113,186 LF of sewer main was completed. The ongoing Phase II I/I Investigation has targeted 209,000 LF of sewer main for TV inspection. Twelve meters (ten permanent and two portable area velocity flow module) have been installed for continued I/I monitoring. Reservoir B Tributary Area TV inspection (30,720 LF) is ongoing (identified 189,168 gpd of peak infiltration). TV inspection work will resume when groundwater levels rise. The Town relined 208 LF of sewer main on Reservoir Street (approximately 14,440 gpd of peak infiltration removed). Reservoir B Pump Station replacement is complete. Instrument/control upgrades for the Kendrick Street and West Street Pump Stations is complete.

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

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 \$6,257,600 allotted through the Program's Phases 1 - 10, the community has \$3,365,450 remaining in funding assistance.

24. NEWTON: North and South Systems

Background Information:

- Miles of Sewer: 271
- Sewered Population: 84,914
- Three Year ('12 - '14) Annual Average I/I: 7.15 mgd
- MassDEP Administrative Actions: ACO-NE-00-1001
ACOP-NE-96-1005 (March 1997)

Latest I/I or SSES Reports:

Commonwealth Ave Sewer/Underdrain Investigation Final Report (May 2011)
Newton Commonwealth Golf Course Sewer & Drain Evaluation Report (November 2012)
CIP – Project 1 Inspection & Assessment Final Report (November 2012)
CIP – Project 1, 2 & 3 Smoke Testing Final Report (November 2012)
CIP – Project 2 Inspection & Assessment Final Report (January 2014)
CIP – Project 4, 5, 6 & 7 Smoke Testing Report (February 2014)
Smoke Testing in Subareas B016, B022 & B029 Final Report (February 2014)
CIP – Project 3 Inspection & Assessment Report (January 6, 2015)
CIP – Project 4 Inspection & Assessment Report (February 19, 2015)
CIP – Project 5 Inspection and Assessment Report (Ongoing – expected 11/15)

Private Source Inflow Removal Program: Private Inflow Source Removal post 8/14 includes: 121 sump pumps, 4 open sewer cleanouts, 24 driveway drains and 3 roof leader locations.

I/I Rehabilitation Projects in Design or Construction: Completed construction of CIP Project 1 Rehabilitations which included: installation of 46,707 lf of Cured-in-Place manhole to manhole pipe liners; lining of 3,079 vf (331 manholes); sealing of underdrain access ports at 92 locations; installation of 73 manhole Inflow dishes.

Bids were accepted on 10/16/14 for the CIP Project 2 Sewer Rehabilitations (Bid Invitation #15-31) with the Contract being awarded to Green Mountain Pipeline. Work began on 2/2/15 with completion expected by the end of CY2015. This project will include sewer rehabilitation of defects found in Sewer Subareas B005, B006, B007, B008, B009, B018, B019, B020, B025, B026 & B031. The estimated I/I removal is 411,213 gpd of Peak Infiltration, 80,712 gpd of Peak Rain-induced Infiltration and 14,445 gpd of Peak Inflow

Reporting Period Activity: Completed CIP Project 3 Inspection & Assessment which included cleaning and inspection of 108,283 lf of sewer.

Completed CIP Project 4 Inspection & Assessment which included cleaning and inspection of 146,246 lf of sewer.

In August 2014 funds were distributed for the construction of the CIP Project 2 Sewer Rehabilitations. This construction project will include the rehabilitation/repair of the defects found in the sanitary sewer Subareas B005 / B006 / B008 / B009 / B018 / B019 B020 / B025 / B026 / B031. The approximate scope of work includes but is not necessarily limited to: cleaning & inspecting 10,100 LF of 5 to 36-inch sewer; chemical root treatment of 28,000 LF of 8 to 15-inch sewer; installation of 15,600 LF of 8 to 15-inch CIP manhole-to-manhole pipe liners; installation of 1100 LF of 8 and 15-inch CIP manhole-to-manhole structural pipe liners; installation of 950 LF of 8 to 15-inch CIP short liners; installation of 120 LF of 8 and 10-inch CIP structural short liners; open cut point repair of sewer at 10 locations; inspection, testing and sealing of 163 service connections; cutting 61 protruding service connections; replacing 12 wye connections; installation of lateral liners at nine sewer service connections; chemical root treatment of 38 manholes; cementitious lining of 280 manholes; sealing seven access ports to the underdrain; sealing 12 cross-connections to the underdrain; installation of 50 manhole inflow dishes; repairing bench/invert at one manhole; repairing chimneys at three manholes; replacing manhole frames and covers at 46 locations; raising manhole frames and covers at three locations; and installing seven sewer manholes.

In November 2014, funds were distributed for the following 3 projects: 1.) Sewer Inspection & Assessment in the CIP Project #5 Area Project will identify defects in the sewer system that contribute to infiltration and inflow (I/I) in Sewer Subareas B053, B054, B055, B056, B056A, B057 & F001. These subareas include an estimated 119,741 lf of sanitary sewer. The field work for this project will include, but not be limited to: conducting top side physical survey of sewer manholes for sources of I/I; conducting flow isolation of sewers; cleaning and internal TV inspection of sewers; updating of sewer mapping/GIS database; preparing draft and final report on the results of the field work; 2.) Design & Construction of Sewer Rehabilitations in CIP Project Areas #3 & 4 Project involves sewer rehabilitations recommended in the CIP Project Areas #3 & 4 which is currently under investigation and evaluation. The specific sewer subareas are: for CIP Project Area #3, B001, B002, B003, B004, B011, B012, B013 and B027; for CIP Project Area 4, B004, B045, B046, B047, B048, B049, B050, B051, B052 & B074. This sewer rehabilitation work will generally include: cleaning & inspecting sewers; chemical root treatment of sewers; installation of cured-in-place manhole-to-manhole pipe liners; installation of cured-in-place short liners; open cut point repair of sewers; inspection, testing and sealing of service connections; cutting of protruding service connections; replacing wye connections; installation of lateral liners at sewer service connections; chemical root treatment of manholes; cementitious lining of manholes; sealing access ports to the underdrain; sealing cross-connections to the underdrain; installation of manhole Inflow dishes; various manholes repairs (bench, invert, chimney); manhole frame & cover replacing & raising; installing sewer manholes; and all other related tasks and appurtenances; 3.) Construction of the CIP Project Area #2 Sewer Rehabilitations The Scope of Services for this project is the same as for the MWRA funded Project #WRA-P9-24-3-901. The Estimated Construction Cost under that project, which was \$3,386,520, was based upon the cost estimate in the City's 2011 Capital Improvement Plan Budget. Since that funding distribution, bids have been accepted for this project so that the updated Project Cost is \$5,300,000. The estimated annual I/I removal is 0.558 MGD for CIP Project Area #2. (MWRA Project No. WRA-P9-24-3-904).

MWRA I/I Local Financial Assistance Program: The community has financed twenty-six (26) I/I reduction projects through the Authority's funding assistance program. Of the \$21,197,400 allotted through the Program's Phases 1 - 10, the community has \$3,668,000 remaining in funding assistance.

25. NORWOOD: South System

Background Information:

- Miles of Sewer: 83
- Sewered Population: 28,254
- Three Year ('12 - '14) Annual Average I/I: 2.52 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 (September 2009)

Private Source Inflow Removal Program: As part of the Meadowbrook Area Sewer Inspection, ten buildings were inspected for illicit connections. Eleven illegal connections removed to date. Within the Hawes Brook sewer tributary area, eight property owners have been notified to redirect sump pumps.

I/I Rehabilitation Projects in Design or Construction: Hoyle Street Area (Hospital Area @ Meadowbrook) Sewer System Rehabilitation Project (MWRA Project No. WRA-P8-25-3-814) is ongoing. Rehabilitation work under this project includes the installation of CIP liner in 2100 LF of sewer main, lining 10 sewer manholes and CIPP lining 45 house service connections. Project work scheduled for completion Summer 2015. Underdrain Manhole Rehabilitation Project (MWRA Project No. WRA-P9-25-3-917) substantially complete. Hawes Brook-Westover Parkway Area Sewer Rehabilitation Construction complete. Meadowbrook Area Sewer Rehabilitation Project is substantially complete. Rehabilitation work under this project includes the installation of CIPP liner in 8190 LF of sewer main, manhole rehabilitation and the CIPP lining of 299 service connections. Hospital and Florence Avenue Areas Sewer Rehabilitation (SRF Project) is complete. Project work included CIPP lining 7500 LF of 6 to 12-inch sewer main, manhole rehabilitation and CIPP lining 100 house service connections.

Reporting Period Activity: I/I Assessment and GIS Tracking Program (MWRA Project No. WRA-P9-25-1-919) work is ongoing.

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 \$6,879,400 allotted through the Program's Phases 1 - 10, the community has \$2,645,901 remaining in funding assistance.

26. QUINCY: South System

Background Information:

- Miles of Sewer: 202
- Sewered Population: 92,909
- Three Year ('12 - '14) Annual Average I/I: 4.74 mgd
- MassDEP Administrative Actions: AO Docket No. 644 (October 1986)

Latest I/I or SSES Report: Squantum Area Flow Monitoring Evaluation Study (May 2008)
Tidal I/I Source Identification Study (July 2009)
Coastal Pipeline Inflow Investigation Study (January 2010)
Quincy SSES (May 2011)
Additional Coastal CCTV Investigations (July 2011)
Downtown I/I Mitigation - New Quincy Center FEIR (November 2012)
Adams Green CCTV Inspections (June 2014)
Coastal Structures I/I Evaluation (Ongoing)

Private Source Inflow Removal Program: Storm Water Discharge Ordinance has been approved. The ordinance forbids non-sanitary connections. A new fee structure was made effective July 1, 2013 and outlines penalties for illegal connections/discharges to the sanitary sewer system. Developers contribute one percent of total project value to the Sewer Rehabilitation Fund.

The City owns a CCTV sewer inspection vehicle. The vehicle provided significant input towards the development of the Tidal I/I Source Identification Study. Also, many of the open cut and rehabilitation repairs on the Phase IIB I/I Reduction Project (detailed below) were identified via the City's CCTV truck during I/I investigative efforts in the Houghs Neck area.

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 Study.

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

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

The Coastal Structures I/I Reduction Project - Phase IIB (MWRA Project No. WRA-P9-26-3-903) was bid in June 2015 with an expected construction start of Fall 2015. Work proposed under this phase includes cleaning & TV inspection of 13,710 LF of sewer main and 103 service laterals and CIPP lining of 6870 LF of sewer main and 66 service laterals in the Houghs Neck / Sea Street / Black's Creek / Furnace Brook Parkway areas. Phase IIB work is estimated to remove 0.65 mgd of peak I/I.

Dysart Street I/I Rehabilitation was previously designed for repair within the above Phase IIB contract. However, this sewer completely collapsed in late April 2014 and was subsequently replaced. This repair work is estimated to have removed 0.04 mgd of peak infiltration.

Grafton Street Sewer Repair: The City replaced 100 LF of 12-inch sewer that had collapsed. The collapsed sewer was allowing a substantial amount of infiltration into the downstream system and causing an indirect illicit connection to the nearby separated storm drain system.

Mallard/Post Island Road I/I Rehabilitation was an open cut repair of 70 LF of 24-inch sewer main that runs through an easement from Mallard Road to Post Island Road. Repair work was performed August 2013. This section of sewer was previously identified for CIPP structural liner installation but collapsed prior to lining. A repair of the upstream sewer main reach was completed Spring 2011 and a full length CIPP liner of the downstream sewer main reach was completed to Sea Street in 2012. To complete the work in this area, a final CIPP liner was installed in Summer 2014. This repair work is estimated to have removed 0.18 mgd of peak I/I. This sewer main abuts the Quincy Bay seawall and the infiltration is believed to be tidally induced.

Underground Technologies Downtown CCTV: MassDOT is currently working on a traffic redesign/streetscape project at the Historic Adams Green area in Downtown Quincy. As part of this areas' work, the City investigated their sewer and drain infrastructure and found some collapsed pipes and many in need of repair within the next 5-10 years. To protect the investment in the Downtown area, the City is in the preliminary rehabilitation design process. This work is expected to improve drainage and water quality conditions in the area. Rehabilitation Construction is anticipated to begin in CY15.

Downtown Redevelopment I/I Mitigation: Also part of the Downtown redevelopment, the City and developer reached an agreement where I/I would be removed from the City's system at a 4:1 ratio to the new proposed sewer flows. In order to satisfy this requirement, both metering and CCTV inspections were completed in the Hospital Hill and Block 4 (Merchants Row) areas to quantify I/I. However, Downtown redevelopment is temporarily on hold as project finances are readjusted. If the I/I rehabilitation work is not completed by the developer, the City intends to include this work on a future I/I mitigation contract.

Reporting Period Activity: The Fort Square Pump Station Upgrades Project was bid in early 2014. Project work was completed Fall 2014. The station services a large portion of southern Quincy and was designed to relieve the surcharging of the trunk sewer in that area. The station, with a design capacity of over 3500 gpm, pumps directly to the MWRA High Level Sewer and ensures that wet weather and high flow events do not cause sanitary sewer overflows in the area. The project's design included mechanical, electrical, site and building upgrades. Existing pump station capacity will not be changed by these improvements.

The City also completed its evaluation of the Quincy Point Pump Station and associated force main. This project is anticipated to be very similar in scope to the Fort Square Pump Station Upgrade. A preliminary update design package was completed Spring 2015 with upgrade construction scheduled for Fall 2015.

Rice Road Sewer Replacement: The City replaced approximately 1500 LF of sewer on Rice Road in the Wollaston Beach area. Project work was completed Fall 2014. This sewer was in need of repair due to trench settlement and suspected infiltration.

Block 4 Infrastructure Upgrades: As part of the Downtown redevelopment, the initial Block 4 phase included upgrades of the sewer and storm drain pipes around the Hancock Street, Chestnut Street and Cottage Avenue triangle. This project is currently under construction with an anticipated completion of Spring 2016. Approximately 170,000 gpd of I/I must be removed prior to the planned occupancy of the Block 4 (Merchants Row) phase of the Downtown redevelopment.

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I reduction projects through the Authority's funding assistance program. Of the \$19,790,000 allotted through the Program's Phases 1 - 10, the community has \$6,908,000 remaining in funding assistance.

27. RANDOLPH: South System

Background Information:

- Miles of Sewer: 101
- Sewered Population: 32,304
- Three Year ('12 - '14) Annual Average I/I: 1.43 mgd
- MassDEP Administrative Actions: AO Docket No. 548 (July 1985)

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

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

I/I Rehabilitation Projects in Design or Construction: An I/I Investigation Report (July 2013) was drafted for the community areas affected by the March 2010 storm events. As a result of that report, a rehabilitation contract (Randolph Contract 15-S1 / MWRA Project No. WRA-P8-27-3-820) was designed (March 2015) and bid (April 2015). Rehabilitation construction is ongoing.

Reporting Period Activity: The Michelle Lane Pump Station was upgraded to increase capacity to allow for the expansion of the Avalon Bay development. Replacement of Vine Street Pump Station is complete.

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I reduction projects through the Authority's funding assistance program. Of the \$6,050,800 allotted through the Program's Phases 1 - 10, the community has \$2,156,000 remaining in funding assistance.

28. READING: North System

Background Information:

- Miles of Sewer: 96
- Sewered Population: 24,751
- Three Year ('12 - '14) Annual Average I/I: 1.34 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report:

Infiltration/Inflow Investigations – Spot Gauging & Flow Isolation Final Report (August 2010)
Infiltration and Inflow (I/I) Investigations Final Report (November 2012)
I/I Investigations Report – Section 2 Supplement (November 2014)

Private Source Inflow Removal Program: No additional sump pumps were removed during this period. The Town is continuing to work with property owners where illicit connections that were found during the Building Inspection Program. The Town received I/I funds totaling \$355,278. The Town will be working to set up a program over the next year to utilize some of the collected funds.

I/I Rehabilitation Projects in Design or Construction: Lewis & Charles Street CIPP Sewer Main Rehabilitation (Contract No. 14-14) which was awarded to Layne Inliner has been completed. Sewer rehabilitation work consisted of CIPP lining 1385 LF of 8-inch sewer main; joint sealing 25 service lateral connections; lining 55 VF of sewer manholes.

During the last year, the Town cleaned and TV inspected an additional 19,885 lf of sewer main; performed 666 joint tests; sealed 265 joints; and cement lined 63 manholes. Approx. 310 lf of sewer was also replaced on Stewart Street
Reporting Period Activity: No additional activities other than those mentioned above.

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 \$4,629,100 allotted through the Program's Phases 1 - 10, the community has \$1,759,000 remaining in funding assistance.

29. REVERE: North System

Background Information:

- Miles of Sewer: 98
- Sewered Population: 52,407
- Three Year ('12 - '14) Annual Average I/I: 3.00 mgd
- MassDEP Administrative Actions: No. 837 (April 1991)
- EPA Clean Water Act Administrative Order: CD 1:10-cv-11460 (November 16, 2010)

Latest I/I or SSES Reports:

Sewer System Evaluation Survey (SSES) Phase I Study Areas – CWSRF No. 3233 Final Report (July 2010)
Internal CCTV Inspection of Revere Trunk Sewer Technical Memorandum Report (October 2011)
Sewer System Evaluation Survey (SSES) – Phase II (CWSRF 3411) Final Report (July 2011)
Sewer System Evaluation Survey (SSES) – Phase III (CWSRF 3513) Final Report (July 2012)
Comprehensive Stormwater and Wastewater Management Plan (CWSRF 3513) Final Report (December 2013)
Sewer System Evaluation Survey (SSES) – Phase IV (CWSRF 3655) Final Report (December 2013)
SSES Phase V and Supplemental Field Investigations (CWSRF 3831) (December 31, 2014)
CMOM Program Development (CWSRF 3817) (March 2015)
SSES – Phase VI and IDDE Planning Investigations (CWSRF 3908) (expected December 31, 2015)

Private Source Inflow Removal Program: The City has awarded Contract 1A to Moriarty and Sons for the redirection of 110 sump pumps and 39 illicit inflow connections. Construction is scheduled to start the week of 8/2/15.

The City will be bidding another 150 sump pumps and 50 illicit inflow connections in August 2015.

The City has identified 518 illicit connections from 1,710 investigations through the amnesty program. The City has initiated house-to-house inspections as performed by EST through program manager CDM-Smith.

There has been no sewer mitigation funds from the developer flow reduction program reported during this time period. The City continues to maintain a (10:1) I/I removal ratio for new commercial and multi-family construction

I/I Rehabilitation Projects in Design or Construction: The City has awarded a contract to Moriarty and Sons in March 2014 for the installation of a storm water pump station to remove and redirect a substantial inflow source from the sanitary system.

During the Phase IV work the City performed the following sewer rehabilitations:

Cured-in-place lining of 12,726 lf of 8" sewer
Cured-in-place lining of 2,560 lf of 10" sewer
Cured-in-place lining of 2,015 lf of 12" sewer
Cured-in-place lining of 612 lf of 14" sewer
Cured-in-place lining of 5,854 lf of 24" sewer
Removing and replacing 265 LF of 8" pipe
Removing and replacing 8 LF of 10" pipe

Removing and replacing 1 LF of 12" pipe
Removing and replacing 88 LF of 15" pipe
Installed lateral service lining at 171 locations.

To date during the Phase V work the City performed the following sewer rehabilitations:

Cured-in-place lining of 33,000 lf of various sized sewer
Performed 72 dig-in-place spot repairs
Cement lined 115 vf of manhole
Installed lateral service lining at 391 locations.
Replaced 120 manhole frames/covers
Cleaned and CCTV 58,000 lf of main line pipe and 90 laterals

Reporting Period Activity: The City completed the rehabilitation of sanitary sewer pump stations at the following locations: Furlong Drive, Linehurst Road, North Marshall Street, Waitt Park, Dix Street & Marshview Terrace.

The City awarded a contract to Moriarty and Sons in March 2015 to rehabilitate a sewer pump station on Milano Ave.

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 \$10,130,900 allotted through the Program's Phases 1 - 10, the community has \$4,628,000 remaining in funding assistance.

30. SOMERVILLE: North System

Background Information:

- Miles of Sewer: 128
- Sewered Population: 75,754
- Three Year ('12 - '14) Annual Average I/I: 4.81 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 2009)
Citywide SSES/Capital Improvement Plan (CIP) (Ongoing)

Private Source Inflow Removal Program: City continues to enforce a 4 to 1 I/I Reduction policy with potential developers if the proposed project increases sanitary flows by more than 2000 gpd. All new development or redevelopment projects are required to separate sewer and stormwater flows leaving the project site. If a separate stormwater system is available in the public right-of-way, stormwater systems from those projects are tied directly into that storm water system.

I/I Rehabilitation Projects in Design or Construction: East Broadway Rehabilitation Project: Construction is continuing with completion expected by the Fall 2015. For the sewer rehabilitation portion of this project, the contractor has completed the lining of most of the 6,800 lf of sewer.

Beacon Street Water and Sewer Improvements Project: The construction was completed this past Summer. The sewer rehabilitation portion of this project included 500 LF of new sewer pipe of various sizes and cleaning & lining of approximately 13,100 LF of existing sewer of various sizes and all manholes.

Reporting Period Activity: The City has contracted with Weston & Sampson to develop a City-wide SSES/Capital Improvement Program (CIP) for the sewer, drain and combined systems. The CIP will create a plan to efficiently: inspect and assess sewer, drain and combined sewer systems city-wide (approximately 165 miles); design improvements for identified defects; construct the required infrastructure improvements. The focus will be on repairing existing infrastructure to improve system performance, reduce I/I, reduce IDDE and extend the systems useful life. Prior reports and available GIS information have been reviewed and assessed. To date, the Consultant has outlined a number of possible approaches

to assist in prioritization of sewer work. Next steps will include City selection of approach, followed by further investigation of existing infrastructure, cleaning and TV work (as needed), design and construction.

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority's funding assistance program. Of the \$15,515,800 allotted through the Program's Phases 1 - 10, the community has \$5,398,000 remaining in funding assistance.

31. STONEHAM: North System

Background Information:

- Miles of Sewer: 63
- Sewered Population: 21,269
- Three Year ('12 - '14) Annual Average I/I: 1.37 mgd
- MassDEP Administrative Actions: None
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-028 (August 2009)

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

Private Source Inflow Removal Program: In conjunction with the Town's stormwater program and contracts, as part of the Town's Phase 4 Illicit Discharge Detection and Elimination Program (IDDE), the Town continues to investigate illicit cross-connections between the sanitary and storm sewer systems. Over the past five years, this work has been successful at identifying and eliminating illicit connections between the systems.

I/I Rehabilitation Projects in Design or Construction: The Phase 4 Sanitary Sewer Rehabilitation Project warranty inspection was completed in the Fall of 2014. This project is now completed.

The Phase 5 Sanitary Sewer System Rehabilitation Design was completed in February 2015. Bids were accepted on March 11, 2015 and the Contract was awarded to Inland Waters. The sewer manhole rehabilitations started on June 15, 2015 and the CCTV work started on June 29, 2015.

The Town Meeting approval has been obtained for the MWRA Phase 10 I/I Local Financial Assistance Program funds. Arcadis will initiate the Design of phase 6 Sanitary Sewer Rehabilitations Project later this year.

Reporting Period Activity: In November 2014, funds were distributed for the Planning, Design & Construction of Phase 5 Sewer System I/I Rehabilitations. This project consists of the work associated with the final planning, design and construction of sewer rehabilitations as presented in the Contract Documents for the Phase 5 Sewer System I/I Rehabilitations Project including associated engineering administration and on-site services during construction. Under the final planning phase, prior studies, reports and inspection data performed throughout the Town's sewer system were reviewed with Town officials and evaluated to determine the sewer rehabilitations to be included under Phase 5 Sewer System I/I Rehabilitations Project. Consequently, the sewer rehabilitation work is located in multiple areas throughout the Town. Recommendations from previous investigations will be reviewed holistically and final rehabilitation recommendations will be made based on the severity of defects, their associated I/I contribution, and the cost effectiveness of rehabilitation for I/I removal. Rehabilitation methods will consist primarily of cured-in-place pipe lining, but may also include: testing and sealing of pipe joints and service connections, cured-in-place spot repairs, and open cut excavation repairs. Manhole rehabilitation methods may include lining manhole chimneys; chemical sealing of walls and joints, pipe connections, and bench and invert; as well as mono-lining and epoxy lining of manholes. (MWRA Project No. WRA-P9-31-3-905).

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 \$4,919,900 allotted through the Program's Phases 1 - 10, the community has \$814,000 remaining in funding assistance.

32. STOUGHTON: South System

Background Information:

- Miles of Sewer: 88
- Sewered Population: 18,937
- Three Year ('12 - '14) Annual Average I/I: 1.23 mgd
- MassDEP Administrative Actions: AO Docket No. 538 (June 1984)

Latest I/I or SSES Report: Flow Metering Report (June 2009)
Sewer System Evaluation (September 2009)
Hydraulic Model Report (December 2009)
Year 5 Rehabilitation Evaluation (December 2009)
Year 6 Rehabilitation Evaluation (March 2011)
Year 7 Rehabilitation Evaluation (December 2011)
Year 8 Rehabilitation Evaluation (May 2013)
Years 9 & 10 Rehabilitation Evaluation (February 2014)
Years 1 & 2 (Round 2) Sewer System I/I Investigation (Ongoing)

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

I/I Rehabilitation Projects in Design or Construction: Years 8/9/10 Infiltration Rehabilitation Construction (Stoughton Contract 15-1 / MWRA Project No. WRA-P9-32-3-902) is ongoing (estimated 0.19 mgd of peak I/I to be removed). Years 8/9/10 Infiltration Rehabilitation Design completed August 2014. Years 9 & 10 Sewer System Evaluation completed February 2014. Year 8 Sewer System Evaluation completed May 2013. Years 6 & 7 Infiltration Rehabilitation Construction (Stoughton Contract 12-2) completed March 2013 (estimated 0.14 mgd of peak I/I removed). Years 6 & 7 Infiltration Rehabilitation Design completed July 2012. Year 7 Sewer System Evaluation Report completed December 2011 (MWRA Project No. WRA-P7-32-1-750).

Reporting Period Activity: Years 1 & 2 (Round 2 of a Ten Year Annual I/I Identification Program) Sewer System I/I Investigation ongoing. Sewer extension of approximately 9000 LF off Daly Drive by private developer is ongoing. Sewer extension of approximately 3000 LF at Forest Green by private developer is ongoing.

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I reduction projects through the Authority's funding assistance program. Of the \$4,722,900 allotted through the Program's Phases 1 - 10, the community has \$1,051,700 remaining in funding assistance.

33. WAKEFIELD: North System

Background Information:

- Miles of Sewer: 93
- Sewered Population: 24,687
- Three Year ('12 - '14) Annual Average I/I: 2.17 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report:

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)

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)

2013 Infiltration & inflow Investigation – Gauging Areas 6 & 7 Final Report (January 2014)

2014 Smoke Testing Program – Gauging Areas 6 & 7 of Subarea 6 (January 2015)

Private Source Inflow Removal Program: The On-Call Sewer System Repair Program which was originally to be bid in the Summer 2014 has been delayed. The Town is now hoping to bid this project in 2015. The Town continues to require a 4 to 1 removal of flow from completed subdivisions/ developments.

I/I Rehabilitation Projects in Design or Construction: During the last year, under the Sewer Subarea 3 Rehabilitation Contract, sewer rehabilitation was completed in the following locations: North Ave (Route 128 to Broadway); Main St. (Lowell St. to Carriage Lane), Lowell St. (Quannapowitt Ave to Main Walden Rd), Albion Street (Tuttle to Byron St.), Salem St (Main St to Tobey Lane); Oak St; Greenwood St; Putnam, Griffin & Karen Rd Area; Pin St., Miriam St., Fell St., Plymouth Rd; Crystal, Gladstone & Lindbergh Area. This sewer rehabilitation consisted of 3,800 lf of cured-in-place lining of sewer, manhole rehabilitations and 4 point repairs of collapsed sewer. This work is expected to remove approximately 15,750 gpd of peak infiltration. It is estimated that an additional 28,000 gpd will be removed prior to October 1, 2015.

Reporting Period Activity: The smoke testing in Subarea 6, Gauging Areas 6 and 7 has been completed with the Report being submitted in January 2015. This smoke testing investigation identified 85,000 gpd of removable peak design storm I/I in these gauging areas.

Flow isolation will be performed in Sewer Subarea 6, Gauging Areas 6 and 7 during high groundwater conditions. The tentative schedule is for Fall of 2015.

Smoke testing and dye testing will be performed in Sewer Subarea 2 in the Summer of 2015. Flow isolation will be performed in Sewer Subarea 2 during high groundwater conditions. The tentative schedule is for Spring of 2016.

The testing, dye testing & flooding and flow isolation of sewers in specific portions of Sewer Subarea 6 – Gauging Areas 6 & 7 project will include performing: smoke testing of approximately 52,000 linear feet of sewer; dyed water testing of up to 10 suspected Inflow sources sites; dyed water flooding of up to 5 suspected Inflow sources sites in conjunction with television inspection of the sanitary sewer (up to 300 lf per dye flood); flow isolation of approximately 52,000 linear feet of 6” to 24” sewer.

In May 2015, funds were distributed for “Infiltration & Inflow Investigations in Sewer Subarea 2”. The Inflow investigations will consist of: smoke testing of up to 40,000 linear feet of sewer; dyed water testing of up to 10 sites; dyed water flooding of up to 5 sites in conjunction with television inspection of the sanitary sewer. The Infiltration investigations will consist of: flow isolation of up to 40,000 linear feet of 6-inch to 15-inch diameter sewer; topside inspection of as many as 250 sewer manholes; cleaning and television inspection of as much as 40,000 linear feet of sewer. The Report will include recommendation for rehabilitation of those sources of I/I which have been identified and a cost-effectiveness analysis. For those sources of I/I that have been located and quantified, the Report will include a plan and cost estimate for the design phase that will include the preparation bid documents for I/I rehabilitation. An opinion of probable construction cost will also be provided. For those sources of I/I that will require additional investigative work, the report will include a plan and cost estimate to conduct those investigations. (MWRA Project No. WRA-P9-33-1-922).

MWRA I/I Local Financial Assistance Program: The community has financed twenty-two (22) I/I reduction projects through the Authority’s funding assistance program. Of the \$5,966,900 allotted through the Program’s Phases 1 - 10, the community has \$2,156,100 remaining in funding assistance.

The Town has submitted a Financial Assistance Application for \$122,100 for the Lakeview Avenue, Plaza Road 7 Spaulding Street Pump Stations Replacement Project (Contract #2015-7). Funding is scheduled to be distributed during the MWRA August 2015 Distribution Period.

34. WALPOLE: South System

Background Information:

- Miles of Sewer: 59
- Sewered Population: 17,448
- Three Year ('12 - '14) Annual Average I/I: 0.66 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: I/I Investigation Program: Year 3 (February 2009)
Flow Metering Report (April 2010)
I/I Investigation Program: Year 4 (June 2011)
I/I Investigation Program: Year 5 (November 2011)
I/I Investigation Program: Year 6 (December 2012)
I/I Investigation Program: Year 7 (January 2014)
I/I Investigation Program: Year 8 (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: Years 4-7 I/I Rehabilitation Project (Walpole Contract 2015-30 / MWRA Project No. WRA-P9-34-3-914) bid May 2015. Construction began July 2015 and is scheduled for completion May 2106. It is estimated that the Years 4-7 project will remove 0.08 mgd of peak infiltration from the Town's sewer system. Years 4-7 Infiltration Rehabilitation Design complete April 2015. Year 7 I/I Investigation was completed January 2014. Project work was undertaken in Subareas 10 / 11 and included TV inspection of 73,614 LF of sewer main and 349 topside manholes inspections. Year 6 I/I Investigation was completed December 2012 (MWRA Project No. WRA-P7-34-1-759). Project work was undertaken in Subareas 3 / 12 and included TV inspection of 61,630 LF of sewer main and 295 topside manholes inspections.

Reporting Period Activity: Year 8 I/I Investigation (MWRA Project No. WRA-P9-34-3-914) work completed Spring 2015 (data review and report preparation is ongoing). There were a total of 70 new connections made to the sewer system over the past year.

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 \$3,680,000 allotted through the Program's Phases 1 - 10, the community has \$638,000 remaining in funding assistance.

35. WALTHAM: North System

Background Information:

- Miles of Sewer: 138
- Sewered Population: 61,120
- Three Year ('12 - '14) Annual Average I/I: 2.74 mgd
- MassDEP Administrative Actions: ACOP-NE-10-1N001 (February 2010)
ACOP-NE-04-1N004 (January 2005)
ACOP-NE-02-1003 (May 2003)
NON-NE-01-1066 (April 2001)

Latest I/I or SSES Report:

Updated Wastewater Facilities Plan (including Operations and Maintenance Plan) (April 2011)
Rangley Acres – I/I Removal Project Report (Spring 2012)
Polaroid Redevelopment Project Report (Summer 2013)
Inflow & Infiltration Improvements Section 5C (Lexington St - Trapelo Rd to Town Line) (March 2014)
Inflow & Infiltration Analysis Sewer System Section 12A-2 Lakeview Area (July 2014)
Inflow & Infiltration Improvements Phase 5.1, Section 6B6 - Pond End Lane Area (August 2014)

Private Source Inflow Removal Program: 13 Sump pumps are to be disconnected this fall as part of the Cedarwood SSO mitigation project. Waltham plans to disconnect 11 more in conjunction with the current City road / paving program. The remainder of the sump pumps will be removed as part of developers/applicants compliance with the City's ordinance for I/I Mitigation. They will be removed in conjunction with the paving / road or other capital improvement projects in future years.

I/I Rehabilitation Projects in Design or Construction: For Cedarwood Area 13/14A, SSO Mitigation Project, 3,200 lf of sewer was cleaned and TV inspected. The design of the SSO Mitigation Project – Area 1314A Cedarwood Area & Surrounding Neighborhoods was completed in December 2014. The Construction Contract was bid on January 8, 2015 and awarded to D'Allessandro Corp. Work started in April 2015. This sewer rehabilitation project is expected to remove 0.10 mgd of annual I/I.

Reporting Period Activity: In February 2015, funds were distributed for "Construction of SSO Mitigation Project – Area 1314 Cedarwood Area & Surrounding Neighborhoods Sanitary Sewer Rehabilitation". The specific location of the sewer rehabilitation work is in Area 1314A on the following streets: Caldwell Road, Cedarwood Avenue, Cunningham Circle, Dorchester Street, Elmwood Avenue, Fairview Avenue, Fairmont Avenue, Fiske Avenue, Flagg Circle, Florence Road, Hamilton Road, Harland Road, Livingstone Lane, Main Street, Milton Street, Pleasant Avenue, Rockridge Road, Stow Street, Summit Avenue, Thornton Road, Villa Street, Virginia Road, Weston Street & Wetherbee Road. The sewer rehabilitation work will include, but not be limited to: chemical root control of approximately 4,460 l.f. of sewer; removal of approximately 6,440 l.f. of roots and tuberculation; replacement of approximately 230 sewer service laterals; replacement of approximately 115 water services encountered in sewer trench; testing & sealing of approximately 330 sewer lateral connections; grinding of approximately 30 service connections; installing approximately 13,880 l.f. of cured in place pipe lining; cleaning & TV inspection of approximately 30 sewer service laterals; lining of approximately 880 v.f. of manholes; sealing of approximately 10 manhole pipe connections, rebuilding of approximately 50 manhole inverts; frame & cover replacement at approximately 33 manholes; reset frame & cover at approximately 40 manholes; cleaning & inspection of approximately 70 manholes; relocation of water blow-off from sewer manhole; relocation of water main at sewer manhole; removal of approximately 13 sump pumps from the sewer system; and all appurtenances including paving, curbing and earthwork items. The estimated annual I/I removal is 0.10 mgd. (MWRA Project No. WRA-P9-35-3-911).

MWRA I/I Local Financial Assistance Program: The community has financed eight (8) I/I investigation projects through the Authority's funding assistance program. Of the \$13,732,400 allotted through the Program's Phases 1 - 10, the community has \$2,355,000 remaining in funding assistance.

36. WATERTOWN: North System

Background Information:

- Miles of Sewer: 75
- Sewered Population: 32,248
- Three Year ('12 - '14) Annual Average I/I: 0.98 mgd
- MassDEP Administrative Actions: ACOP-NE-97-5004

Latest I/I or SSES Report:

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

Private Source Inflow Removal Program: Under the IDDE (Illicit Discharge Detection and Elimination) Plan, 49 homes were inspected and dye tested. No private inflow source removal was performed over the last year.

Five illicit discharges from the sewer system to the drain system were identified this year, of which, 4 have been removed as a result of the replacement of the sewer main and storm drain on Knowles Road. The fifth illicit discharge is from a building at 191 Arlington Street, which has a sink that drains to the storm drain. The owner of the building was sent a notice informing him of the illicit discharge and requirements for removal.

I/I Rehabilitation Projects in Design or Construction: All work associated with Contract No. 12-01S (Construction of Sewer & Drain Replacement in Hovey St) was completed and Costs finalized in August 2014.

Replaced 650 LF of 10-inch drain and 8-inch sewer on Knowles Road, which included one illicit connection and all associated sewer laterals to the property line.

Replaced 130 LF of 6-inch diameter sewer on Barnard Avenue.

Lined 275 LF of 12-inch diameter sewer with a cured-in-place liner on Common Street between Katherine Road and Columbia Street as part of an I/I offsite mitigation for the 20 Summer Street project.

Reporting Period Activity: Video inspected 165 LF of 6-inch diameter sewer on Keenan Street, 111 LF of 12-inch diameter sewer on Sycamore Street, and 4 LF of 8-inch diameter sewer at 218 Belmont Street.

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 \$6,285,800 allotted through the Program's Phases 1 - 10, the community has \$3,704,000 remaining in funding assistance.

The Town has submitted a Financial Assistance Application for the TV Inspection, Design & Construction of recommended Sewer Rehabilitations in the following 3 Areas; 1.) Nichols Ave & Boylston St; 2.) Portions of Subsystems 7 & 8; 3.) Madison Ave, Jefferson Ave & Chapman St Areas. Funding Distribution is expected in November 2015.

37. WELLESLEY: South System

Background Information:

- Miles of Sewer: 130
- Sewered Population: 27,420
- Three Year ('12 - '14) Annual Average I/I: 1.44 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: Based upon previous private source inflow studies, DPW is contacting the owners of identified illegal sump pumps. 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: Contract No. 13C-460-1482 (Sewer Inspection and Rehabilitation) work for CY14/15 - 19,795 LF of sewer main has been TV inspected, 3435 joints tested and 1912 joints sealed with grout. In addition, 6205 LF of VC sewer main was treated for root control and seven (7) short liners were applied. Estimated peak monthly removal is 25,331 gpd.

Contract No. 13C-460-1482 (Sewer Inspection and Rehabilitation) work for CY13/14 - 19,986 LF of sewer main has been TV inspected, 4031 joints tested and 715 joints sealed with grout. In addition, 11,917 LF of VC sewer main was treated for root control. Estimated peak monthly removal is 9126 gpd.

The first year of Contract No. 13C-460-1482 (Sewer Inspection and Rehabilitation) began in December 2012. Eight (8) cured-in-place short liners were installed. Approximately 40 LF of VC sewer pipe has been repaired. There have been fifty-three (53) sewer manholes sealed (totaling 405 VF). In addition, 11,937 LF of VC sewer main was treated for root control. Estimated peak monthly removal is 1281 gpd.

Reporting Period Activity: In FY15, the Town contracted for replacement design of the Sabrina Farm Road Sewer Lift Station. Also, the Pickerel Road Sewer Lift Station was reconstructed and placed back in service.

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 \$5,709,700 allotted through the Program's Phases 1 - 10, the community has \$2,960,892 remaining in funding assistance.

38. WESTWOOD: South System

Background Information:

- Miles of Sewer: 77
- Sewered Population: 13,985
- Three Year ('12 - '14) Annual Average I/I: 0.52 mgd
- MassDEP Administrative Actions: AO Docket No. 578 (May 1985)

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

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

I/I Rehabilitation Projects in Design or Construction: Sewer System Rehabilitation Project (Westwood Project No. 14D-102) is substantially complete. Project work included CIPP lining of 8 to 20-inch sewer main, cementitious interior manhole lining and grouting service laterals/mainline connections (minimum 20 inches up into lateral). Sewer System Rehabilitation Project (Westwood Project No. 4808 / MWRA Project No. WRA-P7-38-3-753) is complete. Warranty liner replacement work on Edgewater Street is complete. Project work included CIPP lining of 17,700 LF of 8 and 12-inch sewer main, 420 VF of cementitious interior manhole lining and grouting 247 service laterals/mainline connections.

Reporting Period Activity: Manhole rehabilitation/replacement work is substantially complete (Westwood Project No. 13-004). Construction of large retail/residential development on University Avenue is ongoing. Project involves installation of new 6 and 8-inch PVC sewer throughout the development. Construction of a private residential development added approximately 1000 LF of 8-inch PVC sewer main that will service up to ten (10) houses via 6-inch PVC connections.

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 \$2,532,300 allotted through the Program's Phases 1 - 10, the community has \$1,107,000 remaining in funding assistance.

39. WEYMOUTH: South System

Background Information:

- Miles of Sewer: 238
- Sewered Population: 52,276
- Three Year ('12 - '14) Annual Average I/I: 3.57 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)
Fall 2013 Inflow Investigation (January 2014)
Town-Wide Sewer Investigation - Year 3 (December 2014)
Town-Wide Sewer Investigation - Year 4 (Ongoing)

Private Source Inflow Removal Program: The Town has completed the redirection of 330 sump pumps (for an estimated 165,000 gpd of inflow removal). Six (6) sump pumps were redirected during FY13-15.

I/I Rehabilitation Projects in Design or Construction: The Year 3 Sewer System Infiltration Rehabilitation Design (Weymouth Contract PW-15-002-S / MWRA Project No. WRA-P9-39-3-909) was completed in June 2015. The Rehabilitation Project was bid July 2015. Rehabilitation Construction will begin Summer 2015 and be complete May 2016.

Work includes CIP lining of 3377 LF of 8 to 15-inch sewer main and 796 VF of cementitious interior manhole lining. Approximately 0.30 mgd of peak I/I will be removed through the project.

The Hinston Road/Neck Street Area Sewer Rehabilitation Project - Phase II Construction was completed September 2013 and an estimated 0.03 mgd of peak infiltration was removed through the project. The Hinston Road/Neck Street Area Sewer Rehabilitation Project (Contract PW-12-006-S / MWRA Project No. WRA-P7-39-3-749) was completed September 2012 and an estimated 0.43 mgd of peak infiltration was removed through the project. Work included CIP lining of 3587 LF of 15 to 24-inch sewer main and 105 VF of cementitious interior manhole lining.

Reporting Period Activity: The investigation phase of the Year 3 Town-Wide Sewer Investigation Program (MWRA Project No. WRA-P8-39-1-826) has been completed. Project Summary report submitted December 2014. The investigation identified approximately 0.17 mgd of infiltration. Year 4 Town-Wide Investigation Program (MWRA Project No. WRA-P9-39-3-909) began March 2015 (Subareas C-3 / D-1-1 / N-1 / N-7) and was completed May 2015. Project Summary report to be completed Fall 2015.

MWRA I/I Local Financial Assistance Program: The community has financed fourteen (14) I/I reduction projects through the Authority's funding assistance program. Of the \$11,480,900 allotted through the Program's Phases 1 - 10, the community has \$5,159,600 remaining in funding assistance.

40. WILMINGTON: North System

Background Information:

- Miles of Sewer: 20
- Sewered Population: 21,612
- Three Year ('12 - '14) Annual Average I/I: 0.42 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Draft Infrastructure Maintenance & Management Program (IMMP) Phase 2 Rpt (March 2005)

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

I/I Rehabilitation Projects in Design or Construction: Re-inspection of the Main Street Interceptor Sewer Rehabilitation Project was completed with one defect needing to be repaired.

Reporting Period Activity: The Town is currently developing an I/I project to hopefully bring to the Spring 2016 Town Meeting.

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 \$2,462,000 allotted through the Program's Phases 1 - 10, the community has \$1,074,000 remaining in funding assistance.

41. WINCHESTER: North System

Background Information:

- Miles of Sewer: 83
- Sewered Population: 21,572
- Three Year ('12 - '14) Annual Average I/I: 1.02 mgd
- MassDEP Administrative Actions: None (Draft ACO in 2001 was not finalized).

Latest I/I or SSES Report:

West Side Building Inspection Report (May 2009)

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

Stowell & Marshall Road Sewer System Evaluation (January 2014)

Sewer System Evaluation Survey (SSES) Phase II (ongoing)

Private Source Inflow Removal Program: The Town's Private Inflow Source Removal Program is ongoing. The Town removed one (1) sump pump from the sewer system during this period.

I/I Rehabilitation Projects in Design or Construction: The Construction of the Squire Road Sanitary Sewer Rehabilitation Project has been completed except for some dig & replace work. This work is expected to be completed in Summer 2015. The work completed consisted of: 8,148 lf of root treatment; 3,727 lf of cured-in-place pipe lining; 161 lf of cured-in-place short lining; sealing of 255 sewer service connections; and cementitious lining of 757 vf of manholes. Final inspection and retesting will be scheduled for Spring 2016.

The Design of the Stowell & Marshal Road Sewer Rehabilitations was completed in April 2015. Bids were accepted on May 14, 2015. The contract was awarded to N. Granese & Sons, Inc. The Notice to Proceed date is July 6, 2015.

Reporting Period Activity:

- The Phase II SSES Project is ongoing. Manhole inspections were completed on April 22, 2015. Flow Isolation and Television Inspection were completed on May 27, 2015. Review of the field data is underway and the Final Report will be issued in fall 2015.

In February 2015, funds were distributed for the following 2 projects: 1.) Phase II Sanitary Sewer Evaluation Survey which will identify and quantify sources of Infiltration and Inflow (I/I) in the sanitary sewer system in Meter Areas #1, 2, & 6 and the Leslie/Lawson tributary subarea. The expected field investigations associated with this project will include, but not be limited to: conducting top side physical survey of as many as 730 sewer manholes for sources of I/I; conducting flow isolation of as many as 116,500 l.f. of sanitary sewer; cleaning and internal TV inspection of as many as 116,500 l.f. of sewer which includes as many as 11,650 l.f. of heavy cleaning; updating of sewer mapping/GIS database; preparing a draft and final report on the results of the field investigations; 2.) Stowell & Marshall Road Sewer Rehabilitation Design & Construction Project consists of the design, construction and engineering construction services associated with the Sanitary Sewer Rehabilitation Project in the Stowell Road & Marshall Road area. This sewer rehabilitation project includes the repair of sewer defects and sewer rehabilitations identified in the Stowell and Marshall Road Sewer System Evaluation Report dated January 2014. The approximate scope of work includes but is not necessarily limited to: open-cut replacement of approximately 65 l.f. of 8" sewer; root treatment of approximately 1,427 l.f. of 8" & 10" sewers and 5 manholes; installation of approximately 2,275 l.f. of 8" & 10" cured-in-place pipe liners; grouting of approximately 29 sewer services; cementitious lining of approximately 109 v.f. of manholes; replacement of 2 manhole frames & covers; building 1 manhole bench & invert; furnishing & installing 1 manhole inflow dish; and all other related tasks and appurtenances including permanent and temporary pavement, police details and mobilization. The estimated annual I/I removal is 0.008mgd. (MWRA Project No. WRA-P9-41-3-910).

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 \$4,183,000 allotted through the Program's Phases 1 - 10, the community has \$735,000 remaining in funding assistance.

42. WINTHROP: North System

Background Information:

- Miles of Sewer: 36
- Sewered Population: 17,737
- Three Year ('12 - '14) Annual Average I/I: 0.81 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Sanitary Sewer Evaluation Report (April 2007)
Sewer System I/I Assessment (April 2014)

Private Source Inflow Removal Program: The DPW, in partnership with the Building & Plumbing Inspectors, continues to actively seek out illegal sump pump connections to the Town's sewer system.

I/I Rehabilitation Projects in Design or Construction: Contract 4 – Sewer, Water and Drain Improvements Project which includes reducing Infiltration and Inflow in the Cottage Hill Area and Pico Beach Area is underway. The sewer rehabilitation portion of this project will include replacing or performing spot repairs in the existing sewer in portions of Beacon Street, Crystal Avenue, Faunbar Avenue, Harbor View Avenue, Plummer Avenue, Prospect Avenue, Sunnyside Avenue & Terrace Avenue. This work includes the replacement of approximately 1,160 linear feet of 8-inch diameter sewer and associated manholes and 12 spot repairs in 8-inch diameter sewers ranging in length from 10 to 50 linear feet. Sewer service laterals in the area where sewer main replacement and spot repair is performed will be replaced from the sewer main to the property line to maximize the reduction of I/I. The Town has submitted a Financial Assistance Application for \$454,000 for this project. Funding is scheduled to be distributed during the MWRA August 2015 Distribution Period. His project is expected to remove 25,000 gpd of annual I/I from the sewer system.

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

MWRA I/I Local Financial Assistance Program: The community has financed eight (8) I/I reduction projects through the Authority’s funding assistance program. Of the \$3,393,400 allotted through the Program’s Phases 1 - 10, the community has \$1,467,000 remaining in funding assistance.

43. WOBURN: North System

Background Information:

- Miles of Sewer: 141
- Sewered Population: 37,364
- Three Year (‘12 - ‘14) Annual Average I/I: 2.55 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:

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)
East Woburn Sewer Collection System Capital Improvement Plan (October 2011)
CIP Smoke Testing – Project 1 Final Report (February 2014)
CIP Project 1 – Sewer Investigation and Evaluation Final Report (March 2014)
CIP Project 2 - Sewer Investigation and Evaluation Final Report (February 2015)
CIP Project 3 - Sewer Investigation and Evaluation Final Report (Ongoing – expected by November 2015)

Private Source Inflow Removal Program: Under the current ACO, a 10:1 flow reduction is required. Two (2) properties were repaired/upgraded to mitigate potential Infiltration.

I/I Rehabilitation Projects in Design or Construction: Design of Recommended Sewer Rehabilitations in CIP Project 2 Area which includes Sewer Mini-systems ES-01, ES-02, ES-03, ES-04, ES-05 & ES-06 is ongoing. The information collected during the CIP Project 2 Sewer Investigation & Evaluation Study will be used to design cost-effective sewer rehabilitations. Design of manhole and pipeline rehabilitations will include “Excavate and Replace” and “Trenchless” rehabilitation techniques such as root treatment, service connection testing & sealing, service connection lining, short liners, spot repairs, cured-in-place pipelining (CIPP), manhole grouting & sealing.

Reporting Period Activity:

Sewer blockages were repaired/cleared at 26 separate locations.

The CIP Project 2 Inspection & Evaluation Project was completed. This project included the cleaning and inspection of approx. 66,000 lf of sewer.

In May 2015, funds were distributed for the following 3 projects: 1.) Sewer Investigation & Evaluation in CIP Project 3 Area will identify sources of infiltration and inflow (I/I) in Sewer Mini-systems ES-18 and ES-20. The field work associated with this project will include, but not be limited to: conducting top side physical survey of approximately 254

sewer manholes for sources of I/I; conducting flow isolation in as much as 48,306 l.f. of sewer; cleaning and internal TV inspection of approximately 48,306 l.f. of sewer; providing as many as 20 hours of heavy cleaning; updating of sewer mapping/GIS database; preparing draft and final report on the results of the field work; 2.) Design of Recommended Sewer Rehabilitations in CIP Project 2 Area involves the design of the recommended sewer rehabilitations in Sewer Mini-systems ES-01, ES-02, ES-03, ES-04, ES-05 & ES-06. The information collected during the CIP Project 2 Sewer Investigation & Evaluation Study will be used to design cost-effective sewer rehabilitations. Design of manhole and pipeline rehabilitations will include “Excavate and Replace” and “Trenchless” rehabilitation techniques such as root treatment, service connection testing & sealing, service connection lining, short liners, spot repairs, cured-in-place pipelining (CIPP), manhole grouting & sealing. The preparation of Contract Documents and assistance during bidding will also be included; 3.) Construction of Recommended Sewer Rehabilitations in CIP Project 1 Area will be performed in Sewer Mini-Systems CS, GA & BR as outlined in the “CIP Project 1 – Sewer Investigation & Evaluation Report (March 2014)”. The scope of work includes but not limited to: various manhole repairs; cementitious lining of manholes; installing manhole inflow dishes; chemical root treatment of sewers & manholes; installing of cured-in-place pipeliners; installing cured-in-place short liners; cleaning, inspection, testing and sealing of sewers; open cut point repairs; cutting protruding service connections; testing & grouting service connections; and other related tasks and appurtenances. This project will also include the engineering services during construction which will include office engineering and resident field engineering services. (MWRA Project No. WRA-P9-43-3-918).

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I reduction projects through the Authority’s funding assistance program. Of the \$10,695,500 allotted through the Program’s Phases 1 - 10, the community has \$2,001,300 remaining in funding assistance.

ATTACHMENT 6
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY15
Reporting Period – July 2014 Through June 2015

CY14 COMMUNITY WASTEWATER FLOW DATA

This attachment contains calendar year 2014 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 CY14 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 CY14 MWRA Community Wastewater Flow Component Estimates. This data is developed through an engineering analysis by MWRA staff to estimate wastewater 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. The estimated average sanitary flow (non I/I flows) includes: residential, commercial, industrial, and institutional flows.

TABLE 3 (three pages - page numbers 4 through 6) presents the CY14 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 CY14. 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 within a community. The calculation is a weighted allocation of the Raw Estimated Infiltration to the portion of the sewer system that is MWRA-owned versus community-owned. The weighted allocation is based on inch-diameter miles of MWRA-owned and community-owned sewer. The data presented in TABLE 4 is also presented in TABLE 2 as an annual summary.

TABLE 1 - CY14 MWRA WASTEWATER METERING SYSTEM COMMUNITY FLOW ESTIMATES

Community	Total Population	Sewered Population	CY14 Average Daily Flow (ADF) By Calendar Month (MGD)												12 Month Average Daily Flow (MGD)
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
			Arlington	43,711	43,274	4.98	4.78	5.77	7.29	4.90	3.54	3.56	3.10	2.94	
Ashland	16,993	13,255	1.30	1.19	1.31	1.73	1.36	0.98	0.86	0.92	0.93	1.00	1.08	1.47	1.18
Bedford	13,765	12,664	2.59	2.41	3.11	3.84	2.99	2.33	2.05	1.89	1.86	1.97	2.22	3.40	2.56
Belmont	25,204	24,776	2.95	2.61	3.73	4.81	2.90	2.23	2.34	1.95	1.82	2.03	2.52	5.43	2.95
BWSC	636,479	635,843	95.03	94.14	95.07	103.62	85.71	78.47	84.44	71.14	66.33	84.84	89.71	114.60	88.59
Braintree	36,249	35,162	8.77	8.20	7.85	9.78	6.77	5.30	4.52	4.05	3.70	4.93	7.68	10.58	6.84
Brookline	59,115	59,056	10.92	10.99	11.78	13.17	9.21	7.61	7.48	6.19	5.27	6.47	8.47	14.04	9.29
Burlington	25,165	24,913	3.36	3.15	4.02	4.77	3.65	2.96	2.77	2.53	2.36	2.48	2.90	4.90	3.32
Cambridge	106,471	106,365	17.39	17.35	18.55	19.04	16.18	15.70	18.32	15.43	15.67	18.41	19.39	25.04	18.05
Canton	21,932	14,629	3.70	3.64	3.98	3.88	2.78	2.30	2.26	2.03	1.96	2.42	2.92	3.92	2.98
Chelsea	36,828	36,828	5.77	5.69	5.69	5.83	4.74	4.01	4.46	3.84	4.01	5.36	5.97	6.99	5.20
Dedham	24,974	23,226	4.34	4.23	4.84	6.15	3.88	2.88	2.69	2.16	1.86	2.51	3.66	6.31	3.79
Everett	42,567	42,567	5.61	5.57	5.28	6.09	4.27	4.73	4.49	3.94	3.26	4.02	4.81	7.71	4.98
Framingham	70,068	63,061	7.27	6.94	8.10	9.73	7.70	6.82	5.97	5.88	5.76	6.15	7.70	10.94	7.42
Hingham	7,279	6,720	1.66	1.77	1.54	2.24	1.35	1.01	0.89	0.73	0.68	0.90	1.47	2.43	1.39
Holbrook	10,899	9,599	1.03	1.03	1.04	1.17	0.88	0.72	0.67	0.64	0.64	0.75	0.96	1.27	0.90
Lexington	32,272	32,266	4.69	4.37	6.20	8.74	6.04	4.26	3.93	3.46	3.03	3.07	3.90	8.70	5.04
Malden	60,374	60,314	9.81	9.19	9.74	11.29	8.90	7.85	8.30	7.26	6.72	7.59	9.45	13.64	9.15
Medford	57,033	56,976	8.69	8.37	9.09	10.72	7.72	6.26	7.15	5.98	5.43	6.31	7.85	12.62	8.02
Melrose	27,435	27,408	5.01	4.49	4.79	6.68	4.44	3.64	4.09	3.48	2.85	3.52	4.71	9.05	4.73
Milton	27,158	25,257	4.04	3.77	4.22	5.47	3.01	2.11	1.84	1.48	1.33	2.06	3.57	6.54	3.28
Natick	33,760	30,013	3.36	3.08	3.89	4.58	3.43	2.75	2.42	2.32	2.18	2.35	2.73	4.06	3.10
Needham	29,366	28,426	4.12	3.45	4.42	5.62	3.84	2.82	2.44	2.16	2.13	2.41	3.00	5.41	3.49
Newton	86,307	85,271	15.30	14.45	18.16	23.50	16.27	12.28	11.25	9.57	8.85	10.11	12.94	24.53	14.77
Norwood	28,780	28,233	6.17	5.94	6.66	8.49	5.30	4.29	3.93	3.49	3.10	4.13	5.83	8.45	5.48
Quincy	93,027	93,027	15.18	14.81	14.92	18.65	13.48	11.70	11.38	10.12	10.09	11.54	14.19	20.02	13.83
Randolph	33,226	33,193	4.39	4.27	4.40	5.68	3.63	2.73	2.39	2.04	1.92	2.57	3.77	5.82	3.63
Reading	25,192	24,512	3.07	2.84	3.71	4.72	3.10	2.27	2.11	1.94	1.70	2.15	2.83	4.80	2.94
Revere	53,179	53,126	6.99	7.08	7.10	9.08	6.78	5.71	6.48	5.35	5.21	6.43	7.59	10.03	6.99
Somerville	77,104	77,104	10.91	10.77	11.50	12.41	9.77	7.93	10.36	7.67	7.26	9.84	11.54	17.70	10.65
Stoneham	21,605	21,216	3.49	2.97	3.71	4.48	2.94	2.44	2.69	2.42	2.10	2.49	2.99	5.92	3.22
Stoughton	18,849	18,937	3.04	2.92	3.10	5.10	3.60	2.65	2.14	1.88	1.77	2.28	3.42	5.14	3.09
Wakefield	25,613	25,101	3.97	3.60	5.65	6.40	4.30	3.14	3.19	2.89	2.34	2.88	4.02	8.28	4.23
Walpole	24,562	17,685	2.21	2.10	2.28	2.87	2.01	1.64	1.48	1.31	1.25	1.44	1.80	2.64	1.92
Waltham	61,918	61,051	9.30	8.59	10.21	11.62	9.43	7.52	7.90	6.87	6.76	7.25	8.24	13.33	8.93
Watertown	32,863	32,863	3.71	3.46	3.98	4.75	3.41	2.73	2.76	2.55	2.37	2.58	3.12	5.29	3.39
Wellesley	28,748	28,029	3.52	3.17	4.14	5.17	3.58	2.68	2.30	2.00	2.06	2.39	2.83	5.04	3.24
Westwood	14,768	14,030	1.65	1.55	1.76	1.97	1.10	0.89	0.82	0.82	0.92	1.16	1.47	2.23	1.36
Weymouth	54,906	53,094	9.18	9.50	8.40	10.83	7.12	5.09	4.36	4.01	3.70	5.57	8.29	12.81	7.39
Wilmington	22,936	4,266	1.27	1.20	1.39	1.55	1.30	1.15	1.13	1.16	1.21	1.26	1.28	1.63	1.29
Winchester	21,869	21,847	2.36	2.14	3.08	3.60	2.52	1.72	1.74	1.43	1.33	1.50	1.86	4.14	2.29
Winthrop	17,940	17,940	2.07	2.06	2.02	2.30	1.91	1.77	1.76	1.55	1.38	1.76	2.00	2.55	1.93
Woburn	38,949	37,781	8.51	8.29	9.07	10.16	7.87	6.30	6.68	5.22	4.70	5.43	6.09	10.22	7.38
Total/Average	2,236,438	2,160,904	332.68	322.12	349.25	409.57	306.07	257.91	264.79	226.85	212.74	259.52	306.81	457.43	308.83
Logan Airport Monthly Rainfall (in)			3.24	4.13	4.48	3.24	2.86	2.62	4.57	1.75	0.70	5.83	5.27	6.56	

TABLE 2 - 2014 MWRA COMMUNITY WASTEWATER FLOW COMPONENT ESTIMATES (CY14-12 MONTHS)

COMMUNITY						2014 Averages (1)			Components of Average Daily Flow (Estimated) (2)							
	Community Demographics		C No. of Connects to MWRA System	D Miles of Local Sewers (3)	E No. of Meters for Permanent System	F Average Daily Flow ADF (MGD)	G Percent Average Daily Flow (6)	H Selected Dry Day ADF (MGD)	I Average Daily Infiltration (MGD)	J Infiltration As a % of Average Daily Flow	K Average Sanitary Flow (MGD)	L Sanitary As a % of Average Daily Flow	M Average Daily Inflow (4) (MGD)	N Inflow As a % of Average Daily Flow	O Peak Month ADF (MGD)	P Percent Peak Month ADF (6)
	A Total Population	B Sewered Population														
Arlington	43,711	43,274	327	106	7	4.66	1.51%	4.15	1.55	33.3%	2.60	55.8%	0.51	10.9%	7.81	1.70%
Ashland	16,993	13,255	2	66	2	1.18	0.38%	1.11	0.31	26.3%	0.80	67.8%	0.06	5.1%	1.73	0.38%
Bedford	13,765	12,664	1	78	4	2.56	0.83%	2.42	1.12	43.8%	1.30	50.8%	0.14	5.5%	3.84	0.84%
Belmont	25,204	24,776	2	78	2	2.95	0.96%	2.53	0.93	31.5%	1.60	54.2%	0.42	14.2%	5.43	1.18%
BWSC (5)	636,479	635,843	255	858	33	88.59	28.69%	74.47	16.47	18.6%	58.00	65.5%	14.12	15.9%	114.60	24.95%
Braintree	36,249	35,162	21	140	8	6.84	2.21%	5.98	2.78	40.6%	3.20	46.8%	0.85	12.4%	10.58	2.30%
Brookline (5)	59,115	59,056	10	111	13	9.29	3.01%	7.86	3.36	36.2%	4.50	48.4%	1.43	15.4%	14.04	3.06%
Burlington	25,165	24,913	1	115	1	3.32	1.08%	3.10	1.10	33.1%	2.00	60.2%	0.23	6.9%	4.90	1.07%
Cambridge (5)	106,471	106,365	127	148	10	18.05	5.84%	14.69	3.69	20.4%	11.00	60.9%	3.36	18.6%	25.04	5.45%
Canton	21,932	14,629	65	62	6	2.98	0.96%	2.70	1.30	43.6%	1.40	47.0%	0.28	9.4%	3.98	0.87%
Chelsea (5)	36,828	36,828	47	41	8	5.20	1.68%	4.08	1.28	24.6%	2.80	53.8%	1.11	21.3%	6.99	1.52%
Dedham	24,974	23,226	30	95	8	3.79	1.23%	3.32	1.52	40.1%	1.80	47.5%	0.47	12.4%	6.31	1.37%
Everett	42,567	42,567	21	57	7	4.98	1.61%	4.31	0.84	16.9%	3.47	69.7%	0.67	13.5%	7.71	1.68%
Framingham	70,068	63,061	2	275	4	7.42	2.40%	6.97	2.47	33.3%	4.50	60.6%	0.45	6.1%	10.94	2.38%
Hingham	7,279	6,720	1	33	1	1.39	0.45%	1.18	0.68	48.9%	1.18	36.0%	0.20	14.4%	2.43	0.53%
Holbrook	10,899	9,599	2	31	2	0.90	0.29%	0.83	0.33	36.7%	0.50	55.6%	0.07	7.8%	1.27	0.28%
Lexington	32,272	32,266	17	170	6	5.04	1.63%	4.61	2.41	47.8%	2.20	43.7%	0.42	8.3%	8.74	1.90%
Malden	60,374	60,314	242	100	6	9.15	2.96%	8.24	3.04	33.2%	5.20	56.8%	0.90	9.8%	13.64	2.97%
Medford	57,033	56,976	74	113	6	8.02	2.60%	6.71	2.21	27.6%	4.50	56.1%	1.31	16.3%	12.62	2.75%
Melrose	27,435	27,408	188	74	5	4.73	1.53%	4.00	2.10	44.4%	1.90	40.2%	0.74	15.6%	9.05	1.97%
Milton	27,158	25,257	56	83	13	3.28	1.06%	2.77	1.38	42.1%	1.39	42.4%	0.52	15.9%	6.54	1.42%
Natick	33,760	30,013	30	135	4	3.10	1.00%	2.85	1.05	33.9%	1.80	58.1%	0.24	7.7%	4.58	1.00%
Needham	29,366	28,426	21	132	2	3.49	1.13%	3.12	1.12	32.1%	2.00	57.3%	0.36	10.3%	5.62	1.22%
Newton	86,307	85,271	52	271	7	14.77	4.78%	13.29	6.29	42.6%	7.00	47.4%	1.49	10.1%	24.53	5.34%
Norwood	28,780	28,233	31	83	6	5.48	1.77%	4.80	2.40	43.8%	2.40	43.8%	0.68	12.4%	8.49	1.85%
Quincy	93,027	93,027	56	202	6	13.83	4.48%	12.45	4.25	30.7%	8.20	59.3%	1.38	10.0%	20.02	4.36%
Randolph	33,226	33,193	2	101	2	3.63	1.18%	3.26	1.26	34.7%	1.99	54.8%	0.37	10.2%	5.82	1.27%
Reading	25,192	24,512	2	96	2	2.94	0.95%	2.66	1.26	42.9%	1.40	47.6%	0.28	9.5%	4.80	1.04%
Revere	53,179	53,126	3	98	2	6.99	2.26%	5.81	2.21	31.6%	3.60	51.5%	1.17	16.7%	10.03	2.18%
Somerville (5)	77,104	77,104	43	128	8	10.65	3.45%	7.53	2.23	20.9%	5.30	49.8%	3.12	29.3%	17.70	3.85%
Stoneham	21,605	21,216	27	63	7	3.22	1.04%	2.77	1.17	36.3%	1.60	49.7%	0.46	14.3%	5.92	1.29%
Stoughton	27,849	18,937	1	85	2	3.09	1.00%	2.82	1.42	46.0%	1.40	45.3%	0.26	8.4%	5.14	1.12%
Wakefield	25,613	25,101	11	93	2	4.23	1.37%	3.73	2.23	52.7%	1.50	35.5%	0.50	11.8%	8.28	1.80%
Walpole	24,562	17,685	1	59	2	1.92	0.62%	1.80	0.60	31.3%	1.20	62.5%	0.11	5.7%	2.87	0.62%
Waltham	61,918	61,051	5	138	4	8.93	2.89%	8.27	2.47	27.7%	5.80	64.9%	0.65	7.3%	13.33	2.90%
Watertown	32,863	32,863	14	75	3	3.39	1.10%	3.08	0.78	23.0%	2.30	67.8%	0.31	9.1%	5.29	1.15%
Wellesley	28,748	28,029	2	130	3	3.24	1.05%	2.93	1.23	38.0%	1.70	52.5%	0.31	9.6%	5.17	1.13%
Westwood	14,768	14,030	3	77	3	1.36	0.44%	1.25	0.45	33.1%	0.80	58.8%	0.11	8.1%	2.23	0.49%
Weymouth	54,906	53,094	19	238	4	7.39	2.39%	6.42	2.73	36.9%	3.69	49.9%	0.97	13.1%	12.81	2.79%
Wilmington	22,936	4,266	2	20	1	1.29	0.42%	1.24	0.44	34.1%	0.80	62.0%	0.06	4.7%	1.63	0.35%
Winchester	21,869	21,847	102	83	7	2.29	0.74%	2.07	0.97	42.4%	1.10	48.0%	0.22	9.6%	4.14	0.90%
Winthrop	17,940	17,940	22	36	4	1.93	0.62%	1.65	0.55	28.5%	1.10	57.0%	0.28	14.5%	2.55	0.56%
Woburn	38,949	37,781	18	141	13	7.38	2.39%	6.89	2.39	32.4%	4.50	61.0%	0.49	6.6%	10.22	2.22%
Totals/Averages	2,236,438	2,160,904	1,958	5,318		308.83	100.00%	266.72	90.37	29.3%	176.34	57.1%	42.08	13.6%	459.36	100.00%

FOOTNOTES:

- (1) Figures tabulated using data from the MWRA Wastewater Metering System for Calendar Year 2014.
- (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 2014 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 - 2014 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)	II (GPD Per IDM)	Infiltration (GPD Per IDM)	Inflow (GPD Per IDM)	Inflow (GPD Per Sewer Mile)	Average Sanitary (GPD Per Sew. Pop.)
Arlington	43,274	106	954	4.66	1.55	0.51	2.60	4,885	2,159	1,625	535	4,811	60
Ashland	13,255	66	594	1.18	0.31	0.06	0.80	1,987	623	522	101	909	60
Bedford	12,664	78	738	2.56	1.12	0.14	1.30	3,469	1,707	1,518	190	1,795	103
Belmont	24,776	78	708	2.95	0.93	0.42	1.60	4,167	1,907	1,314	593	5,385	65
BWSC	635,843	858	14,024	88.59	16.47	14.12	58.00	6,317	2,181	1,174	1,007	16,457	91
Braintree	35,162	140	1,300	6.84	2.78	0.85	3.20	5,262	2,792	2,138	654	6,071	91
Brookline	59,056	111	1,332	9.29	3.36	1.43	4.50	6,974	3,596	2,523	1,074	12,883	76
Burlington	24,913	115	1,150	3.32	1.10	0.23	2.00	2,887	1,157	957	200	2,000	80
Cambridge	106,365	148	2,368	18.05	3.69	3.36	11.00	7,622	2,977	1,558	1,419	22,703	103
Canton	14,629	62	567	2.98	1.30	0.28	1.40	5,256	2,787	2,293	494	4,516	96
Chelsea	36,828	41	618	5.20	1.28	1.11	2.80	8,414	3,867	2,071	1,796	27,073	76
Dedham	23,226	95	832	3.79	1.52	0.47	1.80	4,555	2,392	1,827	565	4,947	77
Everett	42,567	57	686	4.98	0.84	0.67	3.47	7,259	2,201	1,224	977	11,754	82
Frammingham	63,061	275	2,750	7.42	2.47	0.45	4.50	2,698	1,062	898	164	1,636	71
Hingham	6,720	33	297	1.39	0.68	0.20	0.50	4,680	2,963	2,290	673	6,061	74
Holbrook	9,599	31	312	0.90	0.33	0.07	0.50	2,885	1,282	1,058	224	2,258	52
Lexington	32,266	170	1,763	5.04	2.41	0.42	2.20	2,859	1,605	1,367	238	2,471	68
Malden	60,314	100	1,000	9.15	3.04	0.90	5.20	9,150	3,940	3,040	900	9,000	86
Medford	56,976	113	1,130	8.02	2.21	1.31	4.50	7,097	3,115	1,956	1,159	11,593	79
Melrose	27,408	74	641	4.73	2.10	0.74	1.90	7,379	4,431	3,276	1,154	10,061	69
Milton	25,257	83	747	3.28	1.38	0.52	1.39	4,391	2,544	1,847	696	6,265	55
Natick	30,013	135	1,180	3.10	1.05	0.24	1.80	2,627	1,093	890	203	1,778	60
Needham	28,426	132	1,232	3.49	1.12	0.36	2.00	2,833	1,201	909	292	2,727	70
Newton	85,271	271	2,710	14.77	6.29	1.49	7.00	5,450	2,871	2,321	550	5,498	82
Norwood	28,233	83	763	5.48	2.40	0.68	2.40	7,182	4,037	3,145	891	8,193	85
Quincy	93,027	202	2,020	13.83	4.25	1.38	8.20	6,847	2,787	2,104	683	6,832	88
Randolph	33,193	101	1,138	3.63	1.26	0.37	1.99	3,190	1,432	1,107	325	3,663	60
Reading	24,512	96	864	2.94	1.26	0.28	1.40	3,403	1,782	1,458	324	2,917	57
Revere	53,126	98	1,434	6.99	2.21	1.17	3.60	4,874	2,357	1,541	816	11,939	68
Somerville	77,104	128	1,920	10.65	2.23	3.12	5.30	5,547	2,786	1,161	1,625	24,375	69
Stoneham	21,216	63	567	3.22	1.17	0.46	1.60	5,679	2,875	2,063	811	7,302	75
Stoughton	18,937	85	864	3.09	1.42	0.26	1.40	3,576	1,944	1,644	301	3,059	74
Wakefield	25,101	93	888	4.23	2.23	0.50	1.50	4,764	3,074	2,511	563	5,376	60
Walpole	17,685	59	577	1.92	0.60	0.11	1.20	3,328	1,231	1,040	191	1,864	68
Waltham	61,051	138	1,380	8.93	2.47	0.65	5.80	6,471	2,261	1,790	471	4,710	95
Watertown	32,863	75	675	3.39	0.78	0.31	2.30	5,022	1,615	1,156	459	4,133	70
Wellesley	28,029	130	1,300	3.24	1.23	0.31	1.70	2,492	1,185	946	238	2,385	61
Westwood	14,030	77	693	1.36	0.45	0.11	0.80	1,962	808	649	159	1,429	57
Weymouth	53,094	238	2,380	7.39	2.73	0.97	3.69	3,105	1,555	1,147	408	4,076	69
Wilmington	4,266	20	280	1.29	0.44	0.06	0.80	4,607	1,786	1,571	214	3,000	188
Winchester	21,847	83	747	2.29	0.97	0.22	1.10	3,066	1,593	1,299	295	2,651	50
Winthrop	17,940	36	324	1.93	0.55	0.28	1.10	5,957	2,562	1,698	864	7,778	61
Woburn	37,781	141	1,410	7.38	2.39	0.49	4.50	5,234	2,043	1,695	348	3,475	119
Total	2,160,904	5,318	59,857	308.9	90.4	42.1	176.3						
Average	50,254	124	1,392	7.2	2.1	1.0	4.1	4,823	2,236	1,635	601	6,740	77

TABLE 3 - 2014 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	635,843	BWSC	858	BWSC	14,024	BWSC	88.59	BWSC	16.47	BWSC	14.12	BWSC	58.00
Cambridge	106,365	Framingham	275	Framingham	2,750	Cambridge	18.05	Newton	6.29	Cambridge	3.36	Cambridge	11.00
Quincy	93,027	Newton	271	Newton	2,710	Newton	14.77	Quincy	4.25	Somerville	3.12	Quincy	8.20
Newton	85,271	Weymouth	238	Weymouth	2,380	Quincy	13.83	Cambridge	3.69	Newton	1.49	Newton	7.00
Somerville	77,104	Quincy	202	Cambridge	2,368	Somerville	10.65	Brookline	3.36	Brookline	1.43	Waltham	5.80
Framingham	63,061	Lexington	170	Quincy	2,020	Brookline	9.29	Malden	3.04	Quincy	1.38	Somerville	5.30
Waltham	61,051	Cambridge	148	Somerville	1,920	Malden	9.15	Braintree	2.78	Medford	1.31	Malden	5.20
Malden	60,314	Woburn	141	Lexington	1,763	Waltham	8.93	Weymouth	2.73	Revere	1.17	Brookline	4.50
Brookline	59,056	Braintree	140	Revere	1,434	Medford	8.02	Framingham	2.47	Chelsea	1.11	Framingham	4.50
Medford	56,976	Waltham	138	Woburn	1,410	Framingham	7.42	Waltham	2.47	Weymouth	0.97	Medford	4.50
Revere	53,126	Natick	135	Waltham	1,380	Weymouth	7.39	Lexington	2.41	Malden	0.90	Woburn	4.50
Weymouth	53,094	Needham	132	Brookline	1,332	Woburn	7.38	Norwood	2.40	Braintree	0.85	Weymouth	3.69
Arlington	43,274	Wellesley	130	Braintree	1,300	Revere	6.99	Woburn	2.39	Melrose	0.74	Revere	3.60
Everett	42,567	Somerville	128	Wellesley	1,300	Braintree	6.84	Somerville	2.23	Norwood	0.68	Everett	3.47
Woburn	37,781	Burlington	115	Needham	1,232	Norwood	5.48	Wakefield	2.23	Everett	0.67	Braintree	3.20
Chelsea	36,828	Medford	113	Natick	1,180	Chelsea	5.20	Medford	2.21	Waltham	0.65	Waltham	2.80
Braintree	35,162	Brookline	111	Burlington	1,150	Lexington	5.04	Revere	2.21	Milton	0.52	Arlington	2.60
Randolph	33,193	Arlington	106	Randolph	1,138	Everett	4.98	Melrose	2.10	Arlington	0.51	Norwood	2.40
Watertown	32,863	Randolph	101	Medford	1,130	Melrose	4.73	Arlington	1.55	Wakefield	0.50	Watertown	2.30
Lexington	32,266	Malden	100	Malden	1,000	Arlington	4.66	Dedham	1.52	Woburn	0.49	Lexington	2.20
Natick	30,013	Revere	98	Arlington	954	Wakefield	4.23	Stoughton	1.42	Dedham	0.47	Burlington	2.00
Needham	28,426	Reading	96	Wakefield	888	Dedham	3.79	Milton	1.38	Stoneham	0.46	Needham	2.00
Norwood	28,233	Dedham	95	Reading	864	Randolph	3.63	Canton	1.30	Framingham	0.45	Randolph	1.99
Wellesley	28,029	Wakefield	93	Stoughton	864	Needham	3.49	Chelsea	1.28	Belmont	0.42	Melrose	1.90
Melrose	27,408	Stoughton	85	Dedham	832	Watertown	3.39	Randolph	1.26	Lexington	0.42	Dedham	1.80
Milton	25,257	Milton	83	Norwood	763	Burlington	3.32	Reading	1.26	Randolph	0.37	Natick	1.80
Wakefield	25,101	Norwood	83	Milton	747	Milton	3.28	Wellesley	1.23	Needham	0.36	Wellesley	1.70
Burlington	24,913	Winchester	83	Winchester	747	Wellesley	3.24	Stoneham	1.17	Watertown	0.31	Belmont	1.60
Belmont	24,776	Bedford	78	Bedford	738	Stoneham	3.22	Bedford	1.12	Wellesley	0.31	Stoneham	1.60
Reading	24,512	Belmont	78	Belmont	708	Natick	3.10	Needham	1.12	Canton	0.28	Wakefield	1.50
Dedham	23,226	Westwood	77	Westwood	693	Stoughton	3.09	Burlington	1.10	Reading	0.28	Canton	1.40
Winchester	21,847	Watertown	75	Everett	686	Canton	2.98	Natick	1.05	Winthrop	0.28	Reading	1.40
Stoneham	21,216	Melrose	74	Watertown	675	Belmont	2.95	Winchester	0.97	Stoughton	0.26	Stoughton	1.40
Stoughton	18,937	Ashland	66	Melrose	641	Reading	2.94	Belmont	0.93	Natick	0.24	Milton	1.39
Winthrop	17,940	Stoneham	63	Chelsea	618	Bedford	2.56	Everett	0.84	Burlington	0.23	Bedford	1.30
Walpole	17,685	Canton	62	Ashland	594	Winchester	2.29	Watertown	0.78	Winchester	0.22	Walpole	1.20
Canton	14,629	Walpole	59	Walpole	577	Winthrop	1.93	Hingham	0.68	Hingham	0.20	Winchester	1.10
Westwood	14,030	Everett	57	Canton	567	Winthrop	1.92	Walpole	0.60	Bedford	0.14	Winthrop	1.10
Ashland	13,255	Chelsea	41	Stoneham	567	Hingham	1.39	Walpole	0.55	Walpole	0.11	Ashland	0.80
Bedford	12,664	Winthrop	36	Winthrop	324	Westwood	1.36	Westwood	0.45	Westwood	0.11	Westwood	0.80
Holbrook	9,599	Hingham	33	Holbrook	312	Wilmington	1.29	Wilmington	0.44	Holbrook	0.07	Wilmington	0.80
Hingham	6,720	Holbrook	31	Hingham	297	Ashland	1.18	Holbrook	0.33	Ashland	0.06	Hingham	0.50
Wilmington	4,266	Wilmington	20	Wilmington	280	Holbrook	0.90	Ashland	0.31	Wilmington	0.06	Holbrook	0.50
Total	2,160,904	Total	5,318	Total	59,857	Total	309	Total	90	Total	42	Total	176
Average	50,254	Average	124	Average	1,392	Average	7	Average	2	Average	1	Average	4

TABLE 3 - 2014 Final Community Wastewater Flow Component Estimates (Ranked Detail page 3 of 3)

Community	ADF (GPD Per IDM)	Community	I/I (GPD Per IDM)	Community	Infiltration (GPD Per IDM)	Community	Inflow (GPD Per IDM)	Community	Inflow (GPD Per Sewer Mile)	Community	Average Sanitary (GPD Per Sew. Pop.)
Malden	9,150	Melrose	4,431	Melrose	3,276	Chelsea	1,796	Chelsea	27,073	Wilmington	188
Chelsea	8,414	Norwood	4,037	Norwood	3,145	Somerville	1,625	Somerville	24,375	Woburn	119
Cambridge	7,622	Malden	3,940	Malden	3,040	Cambridge	1,419	Cambridge	22,703	Cambridge	103
Melrose	7,379	Chelsea	3,867	Brookline	2,523	Medford	1,159	BWSC	16,457	Bedford	103
Everett	7,259	Brookline	3,596	Wakefield	2,511	Melrose	1,154	Brookline	12,883	Canton	96
Norwood	7,182	Medford	3,115	Newton	2,321	Brookline	1,074	Revere	11,939	Waltham	95
Medford	7,097	Wakefield	3,074	Canton	2,293	BWSC	1,007	Everett	11,754	BWSC	91
Brookline	6,974	Cambridge	2,977	Hingham	2,290	Everett	977	Medford	11,593	Braintree	91
Quincy	6,847	Hingham	2,963	Braintree	2,138	Malden	900	Melrose	10,061	Quincy	88
Waltham	6,471	Stoneham	2,875	Quincy	2,104	Norwood	891	Malden	9,000	Malden	86
BWSC	6,317	Newton	2,871	Chelsea	2,071	Winthrop	864	Norwood	8,193	Norwood	85
Winthrop	5,957	Braintree	2,792	Stoneham	2,063	Revere	816	Winthrop	7,778	Newton	82
Stoneham	5,679	Quincy	2,787	Medford	1,956	Stoneham	811	Stoneham	7,302	Everett	82
Somerville	5,547	Canton	2,787	Milton	1,847	Milton	696	Quincy	6,832	Burlington	80
Newton	5,450	Somerville	2,786	Dedham	1,827	Quincy	683	Milton	6,265	Medford	79
Braintree	5,262	Winthrop	2,562	Waltham	1,790	Hingham	673	Braintree	6,071	Dedham	77
Canton	5,256	Milton	2,544	Winthrop	1,698	Braintree	654	Hingham	6,061	Brookline	76
Woburn	5,234	Dedham	2,392	Woburn	1,695	Belmont	593	Newton	5,498	Chelsea	76
Watertown	5,022	Revere	2,357	Stoughton	1,644	Dedham	565	Belmont	5,385	Stoneham	75
Arlington	4,885	Waltham	2,261	Arlington	1,625	Wakefield	563	Wakefield	5,376	Hingham	74
Revere	4,874	Everett	2,201	Wilmington	1,571	Newton	550	Dedham	4,947	Stoughton	74
Wakefield	4,764	BWSC	2,181	Cambridge	1,558	Arlington	535	Arlington	4,811	Framingham	71
Hingham	4,680	Arlington	2,159	Revere	1,541	Canton	494	Waltham	4,710	Needham	70
Wilmington	4,607	Woburn	2,043	Bedford	1,518	Waltham	471	Canton	4,516	Watertown	70
Dedham	4,555	Stoughton	1,944	Reading	1,458	Watertown	459	Watertown	4,133	Weymouth	69
Milton	4,391	Belmont	1,907	Lexington	1,367	Weymouth	408	Weymouth	4,076	Melrose	69
Belmont	4,167	Wilmington	1,786	Belmont	1,314	Woburn	348	Randolph	3,663	Somerville	69
Stoughton	3,576	Reading	1,782	Winchester	1,299	Randolph	325	Woburn	3,475	Lexington	68
Bedford	3,469	Bedford	1,707	Everett	1,224	Reading	324	Stoughton	3,059	Walpole	68
Reading	3,403	Watertown	1,615	BWSC	1,174	Stoughton	301	Wilmington	3,000	Revere	68
Walpole	3,328	Lexington	1,605	Somerville	1,161	Winchester	295	Reading	2,917	Belmont	65
Randolph	3,190	Winchester	1,593	Watertown	1,156	Watertown	292	Needham	2,727	Winthrop	61
Weymouth	3,105	Weymouth	1,555	Weymouth	1,147	Wellesley	238	Winchester	2,651	Wellesley	61
Winchester	3,066	Randolph	1,432	Randolph	1,107	Lexington	238	Lexington	2,471	Ashland	60
Burlington	2,887	Holbrook	1,282	Holbrook	1,058	Holbrook	224	Wellesley	2,385	Arlington	60
Holbrook	2,885	Walpole	1,231	Walpole	1,040	Wilmington	214	Holbrook	2,258	Natick	60
Lexington	2,859	Needham	1,201	Burlington	957	Natick	203	Burlington	2,000	Randolph	60
Needham	2,833	Wellesley	1,185	Wellesley	946	Burlington	200	Walpole	1,864	Wakefield	60
Framingham	2,698	Burlington	1,157	Needham	909	Walpole	191	Bedford	1,795	Reading	57
Natick	2,627	Natick	1,093	Framingham	898	Bedford	190	Natick	1,778	Westwood	57
Wellesley	2,492	Framingham	1,062	Natick	890	Framingham	164	Framingham	1,636	Milton	55
Ashland	1,987	Westwood	808	Westwood	649	Westwood	159	Westwood	1,429	Holbrook	52
Westwood	1,962	Ashland	623	Ashland	522	Ashland	101	Ashland	909	Winchester	50
Average	4,821	Average	2,236	Average	1,635	Total	601	Average	6,742	Average	77

Table 4 - Estimated Community Wastewater Flow Components for 2014

9-Jun-15

PAGE 1

Annual Average (MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Ashland	Average Daily Flow	1.30	1.19	1.31	1.73	1.36	0.98	0.86	0.92	0.93	1.00	1.08	1.47	1.18
	Dry Day Average Daily Flow	1.25	1.16	1.24	1.56	1.27	0.91	0.85	0.91	0.91	0.99	0.97	1.34	1.11
	Estimated Infiltration	0.45	0.36	0.44	0.76	0.47	0.11	0.05	0.11	0.11	0.19	0.17	0.54	0.31
	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	0.07	0.17	0.09	0.07	0.01	0.01	0.01	0.02	0.01	0.11	0.13
Boston (South Only)	Raw Average Daily Flow	24.16	18.23	21.72	27.17	19.98	14.16	15.06	12.43	10.25	15.44	19.07	33.47	19.29
	Raw Dry Day Average Daily Flow	21.38	13.13	16.72	24.72	17.44	9.83	11.50	11.03	9.69	12.25	15.78	28.57	16.04
	Raw Estimated Infiltration	13.38	5.13	8.72	16.72	9.44	1.83	3.50	3.03	1.69	4.25	7.78	20.57	8.04
	MWRA Estimated Infiltration	5.59	2.14	3.64	6.99	3.94	0.76	1.46	1.27	0.71	1.78	3.25	8.60	3.36
	Final Average Daily Flow	18.57	16.09	18.08	20.18	16.04	13.40	13.60	11.16	9.54	13.66	15.82	24.87	15.93
	Final Dry Day Average Daily Flow	15.79	10.99	13.08	17.73	13.50	9.07	10.04	9.76	8.98	10.47	12.53	19.97	12.68
	Final Estimated Infiltration	7.79	2.99	5.08	9.73	5.50	1.07	2.04	1.76	0.98	2.47	4.53	11.97	4.68
	Estimated Sanitary Flow	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Estimated Inflow	2.78	5.10	5.00	2.45	2.54	4.33	3.56	1.40	0.56	3.19	3.29	4.90	3.25	
Braintree	Raw Average Daily Flow	9.57	8.72	8.49	10.85	7.34	5.61	4.72	4.16	3.78	5.13	8.24	11.70	7.35
	Raw Dry Day Average Daily Flow	8.32	6.53	7.32	10.03	6.82	5.20	4.48	3.91	3.73	4.45	6.81	10.36	6.50
	Raw Estimated Infiltration	5.12	3.33	4.12	6.83	3.62	2.00	1.28	0.71	0.53	1.25	3.61	7.16	3.30
	MWRA Estimated Infiltration	0.80	0.52	0.64	1.07	0.57	0.31	0.20	0.11	0.08	0.20	0.56	1.12	0.52
	Final Average Daily Flow	8.77	8.20	7.85	9.78	6.77	5.30	4.52	4.05	3.70	4.93	7.68	10.58	6.84
	Final Dry Day Average Daily Flow	7.52	6.01	6.68	8.96	6.25	4.89	4.28	3.80	3.65	4.25	6.25	9.24	5.98
	Final Estimated Infiltration	4.32	2.81	3.48	5.76	3.05	1.69	1.08	0.60	0.45	1.05	3.05	6.04	2.78
	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
Estimated Inflow	1.25	2.19	1.17	0.82	0.52	0.41	0.24	0.25	0.05	0.68	1.43	1.34	0.85	
Brookline (South Only)	Average Daily Flow	7.74	7.06	8.11	9.26	5.77	4.17	3.82	3.28	2.52	3.43	5.25	10.00	5.86
	Dry Day Average Daily Flow	6.42	5.27	6.53	8.26	5.42	3.43	3.07	2.95	2.29	2.71	4.06	7.08	4.79
	Estimated Infiltration	4.22	3.07	4.33	6.06	3.22	1.23	0.87	0.75	0.09	0.51	1.86	4.88	2.59
	Estimated Sanitary Flow	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
	Estimated Inflow	1.32	1.79	1.58	1.00	0.35	0.74	0.75	0.33	0.23	0.72	1.19	2.92	1.07
Canton	Raw Average Daily Flow	3.98	3.88	4.28	4.19	2.96	2.42	2.37	2.12	2.04	2.52	3.09	4.21	3.17
	Raw Dry Day Average Daily Flow	3.64	3.28	3.77	3.83	2.80	2.38	2.25	2.08	2.01	2.22	2.70	3.68	2.89
	Raw Estimated Infiltration	2.24	1.88	2.37	2.43	1.40	0.98	0.85	0.68	0.61	0.82	1.30	2.28	1.49
	MWRA Estimated Infiltration	0.28	0.24	0.30	0.31	0.18	0.12	0.11	0.09	0.08	0.10	0.17	0.29	0.19
	Final Average Daily Flow	3.70	3.64	3.98	3.88	2.78	2.30	2.26	2.03	1.96	2.42	2.92	3.92	2.98
	Final Dry Day Average Daily Flow	3.36	3.04	3.47	3.52	2.62	2.26	2.14	1.99	1.93	2.12	2.53	3.39	2.70
	Final Estimated Infiltration	1.96	1.64	2.07	2.12	1.22	0.86	0.74	0.59	0.53	0.72	1.13	1.99	1.30
	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	0.34	0.60	0.51	0.36	0.16	0.04	0.12	0.04	0.03	0.30	0.39	0.53	0.28	
Dedham	Average Daily Flow	4.34	4.23	4.84	6.15	3.88	2.88	2.69	2.16	1.86	2.51	3.66	6.31	3.79
	Dry Day Average Daily Flow	3.89	3.31	4.10	5.56	3.69	2.72	2.41	2.01	1.82	2.13	3.03	5.18	3.32
	Estimated Infiltration	2.09	1.51	2.30	3.76	1.89	0.92	0.61	0.21	0.02	0.33	1.23	3.38	1.52
	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	0.45	0.92	0.74	0.59	0.19	0.16	0.28	0.15	0.04	0.38	0.63	1.13	0.47

Table 4 - Estimated Community Wastewater Flow Components for 2014													9-Jun-15	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	7.29	6.96	8.13	9.78	7.73	6.84	5.98	5.89	5.77	6.16	7.73	11.00	7.44	
	Raw Dry Day Average Daily Flow	6.61	6.41	7.06	9.00	7.59	6.60	5.89	5.65	5.65	5.92	7.30	10.22	6.99	
	Raw Estimated Infiltration	2.11	1.91	2.56	4.50	3.09	2.10	1.39	1.15	1.15	1.42	2.80	5.72	2.49	
	MWRA Estimated Infiltration	0.02	0.02	0.03	0.05	0.03	0.02	0.01	0.01	0.01	0.01	0.03	0.06	0.03	
	Final Average Daily Flow	7.27	6.94	8.10	9.73	7.70	6.82	5.97	5.88	5.76	6.15	7.70	10.94	7.42	
	Final Dry Day Average Daily Flow	6.59	6.39	7.03	8.95	7.56	6.58	5.88	5.64	5.64	5.91	7.27	10.16	6.97	
	Final Estimated Infiltration	2.09	1.89	2.53	4.45	3.06	2.08	1.38	1.14	1.14	1.41	2.77	5.66	2.47	
	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	0.68	0.55	1.07	0.78	0.14	0.24	0.09	0.24	0.12	0.24	0.43	0.78	0.45	
Hingham	Average Daily Flow	1.66	1.77	1.54	2.24	1.35	1.01	0.89	0.73	0.68	0.90	1.47	2.43	1.39	
	Dry Day Average Daily Flow	1.37	1.13	1.28	1.99	1.26	0.94	0.84	0.72	0.66	0.80	1.15	2.04	1.18	
	Estimated Infiltration	0.87	0.63	0.78	1.49	0.76	0.44	0.34	0.22	0.16	0.30	0.65	1.54	0.68	
	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	0.29	0.64	0.26	0.25	0.09	0.07	0.05	0.01	0.02	0.10	0.32	0.39	0.20	
Holbrook	Average Daily Flow	1.03	1.03	1.04	1.17	0.88	0.72	0.67	0.64	0.64	0.75	0.96	1.27	0.90	
	Dry Day Average Daily Flow	0.92	0.84	0.91	1.10	0.85	0.71	0.65	0.64	0.64	0.70	0.83	1.15	0.83	
	Estimated Infiltration	0.42	0.34	0.41	0.60	0.35	0.21	0.15	0.14	0.14	0.20	0.33	0.65	0.33	
	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	0.11	0.19	0.13	0.07	0.03	0.01	0.02	0.00	0.00	0.05	0.13	0.12	0.07	
Milton (South Only)	Average Daily Flow	3.81	3.55	3.97	5.10	2.77	1.93	1.67	1.32	1.16	1.86	3.36	6.11	3.05	
	Dry Day Average Daily Flow	3.39	2.63	3.18	4.45	2.57	1.73	1.50	1.26	1.11	1.54	2.57	4.65	2.55	
	Estimated Infiltration	2.14	1.38	1.93	3.20	1.32	0.48	0.25	0.01	0.01	0.29	1.32	3.40	1.31	
	Estimated Sanitary Flow	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.10	1.25	1.25	1.25	1.24	
	Estimated Inflow	0.42	0.92	0.79	0.65	0.20	0.20	0.17	0.06	0.05	0.32	0.79	1.46	0.50	
Natick	Average Daily Flow	3.36	3.08	3.89	4.58	3.43	2.75	2.42	2.32	2.18	2.35	2.73	4.06	3.10	
	Dry Day Average Daily Flow	3.05	2.72	3.38	4.20	3.28	2.59	2.38	2.27	2.07	2.22	2.56	3.52	2.85	
	Estimated Infiltration	1.25	0.92	1.58	2.40	1.48	0.79	0.58	0.47	0.27	0.42	0.76	1.72	1.05	
	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	0.31	0.36	0.51	0.38	0.15	0.16	0.04	0.05	0.11	0.13	0.17	0.54	0.24	
Needham	Average Daily Flow	4.12	3.45	4.42	5.62	3.84	2.82	2.44	2.16	2.13	2.41	3.00	5.41	3.49	
	Dry Day Average Daily Flow	3.41	2.91	3.77	5.14	3.67	2.62	2.33	2.06	2.04	2.23	2.66	4.63	3.12	
	Estimated Infiltration	1.41	0.91	1.77	3.14	1.67	0.62	0.33	0.06	0.04	0.23	0.66	2.63	1.12	
	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	0.71	0.54	0.65	0.48	0.17	0.20	0.11	0.10	0.09	0.18	0.34	0.78	0.36	
Newton (South Only)	Average Daily Flow	9.37	8.50	10.80	13.80	9.37	6.15	5.72	4.10	3.67	5.37	7.79	15.22	8.33	
	Dry Day Average Daily Flow	7.97	6.57	8.84	11.65	9.07	6.00	4.98	3.88	3.48	4.41	6.52	12.62	7.17	
	Estimated Infiltration	4.87	3.47	5.74	8.55	5.97	2.90	1.88	0.78	0.38	1.31	3.42	9.52	4.07	
	Estimated Sanitary Flow	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	
	Estimated Inflow	1.40	1.93	1.96	2.15	0.30	0.15	0.74	0.22	0.19	0.96	1.27	2.60	1.15	

Table 4 - Estimated Community Wastewater Flow Components for 2014

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Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Norwood	Raw Average Daily Flow	6.71	6.37	7.24	9.37	5.80	4.58	4.17	3.68	3.22	4.38	6.31	9.31	5.93	
	Raw Dry Day Average Daily Flow	5.86	5.12	6.12	7.99	5.57	4.26	3.94	3.59	3.17	3.99	5.49	7.87	5.25	
	Raw Estimated Infiltration	3.46	2.72	3.72	5.59	3.17	1.86	1.54	1.19	0.77	1.59	3.09	5.47	2.85	
	MWRA Estimated Infiltration	0.54	0.43	0.58	0.88	0.50	0.29	0.24	0.19	0.12	0.25	0.48	0.86	0.45	
	Final Average Daily Flow	6.17	5.94	6.66	8.49	5.30	4.29	3.93	3.49	3.10	4.13	5.83	8.45	5.48	
	Final Dry Day Average Daily Flow	5.32	4.69	5.54	7.11	5.07	3.97	3.70	3.40	3.05	3.74	5.01	7.01	4.80	
	Final Estimated Infiltration	2.92	2.29	3.14	4.71	2.67	1.57	1.30	1.00	0.65	1.34	2.61	4.61	2.40	
	Estimated Sanitary Flow	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
	Estimated Inflow	0.85	1.25	1.12	1.38	0.23	0.32	0.23	0.09	0.05	0.39	0.82	1.44	0.68	
Quincy	Average Daily Flow	15.18	14.81	14.92	18.65	13.48	11.70	11.38	10.12	10.09	11.54	14.19	20.02	13.83	
	Dry Day Average Daily Flow	13.50	11.78	12.99	17.15	12.97	11.16	10.44	9.91	9.80	10.42	12.12	17.12	12.45	
	Estimated Infiltration	5.30	3.58	4.79	8.95	4.77	2.96	2.24	1.71	1.60	2.22	3.92	8.92	4.25	
	Estimated Sanitary Flow	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	
	Estimated Inflow	1.68	3.03	1.93	1.50	0.51	0.54	0.94	0.21	0.29	1.12	2.07	2.90	1.38	
Randolph	Average Daily Flow	4.39	4.27	4.40	5.68	3.63	2.73	2.39	2.04	1.92	2.57	3.77	5.82	3.63	
	Dry Day Average Daily Flow	4.05	3.33	3.81	5.24	3.42	2.51	2.22	2.01	1.91	2.23	3.10	5.24	3.26	
	Estimated Infiltration	2.05	1.33	1.81	3.24	1.42	0.51	0.22	0.01	0.01	0.23	1.10	3.24	1.26	
	Estimated Sanitary Flow	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.90	2.00	2.00	1.99	
	Estimated Inflow	0.34	0.94	0.59	0.44	0.21	0.22	0.17	0.03	0.01	0.34	0.67	0.58	0.37	
Stoughton	Raw Average Daily Flow	3.05	2.93	3.11	5.13	3.62	2.66	2.15	1.88	1.77	2.29	3.43	5.16	3.10	
	Raw Dry Day Average Daily Flow	2.83	2.40	2.74	4.81	3.51	2.37	2.10	1.80	1.74	2.11	2.98	4.61	2.84	
	Raw Estimated Infiltration	1.43	1.00	1.34	3.41	2.11	0.97	0.70	0.40	0.34	0.71	1.58	3.21	1.44	
	MWRA Estimated Infiltration	0.01	0.01	0.01	0.03	0.02	0.01	0.01	0.00	0.00	0.01	0.01	0.02	0.01	
	Final Average Daily Flow	3.04	2.92	3.10	5.10	3.60	2.65	2.14	1.88	1.77	2.28	3.42	5.14	3.09	
	Final Dry Day Average Daily Flow	2.82	2.39	2.73	4.78	3.49	2.36	2.09	1.80	1.74	2.10	2.97	4.59	2.82	
	Final Estimated Infiltration	1.42	0.99	1.33	3.38	2.09	0.96	0.69	0.40	0.34	0.70	1.57	3.19	1.42	
	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	0.22	0.53	0.37	0.32	0.11	0.29	0.05	0.08	0.03	0.18	0.45	0.55	0.26	
Walpole	Average Daily Flow	2.21	2.10	2.28	2.87	2.01	1.64	1.48	1.31	1.25	1.44	1.80	2.64	1.92	
	Dry Day Average Daily Flow	2.19	1.90	1.99	2.64	1.94	1.60	1.40	1.25	1.22	1.31	1.73	2.48	1.80	
	Estimated Infiltration	0.99	0.70	0.79	1.44	0.74	0.40	0.20	0.05	0.02	0.11	0.53	1.28	0.60	
	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	0.02	0.20	0.29	0.23	0.07	0.04	0.08	0.06	0.03	0.13	0.07	0.16	0.11	
Wellesley	Average Daily Flow	3.52	3.17	4.14	5.17	3.58	2.68	2.30	2.00	2.06	2.39	2.83	5.04	3.24	
	Dry Day Average Daily Flow	3.23	2.79	3.54	4.70	3.40	2.45	2.11	1.90	1.96	2.24	2.59	4.22	2.93	
	Estimated Infiltration	1.53	1.09	1.84	3.00	1.70	0.75	0.41	0.20	0.26	0.54	0.89	2.52	1.23	
	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	0.29	0.38	0.60	0.47	0.18	0.23	0.19	0.10	0.10	0.15	0.24	0.82	0.31	
Westwood	Average Daily Flow	1.65	1.55	1.76	1.97	1.10	0.89	0.82	0.82	0.92	1.16	1.47	2.23	1.36	
	Dry Day Average Daily Flow	1.50	1.27	1.56	1.91	1.07	0.83	0.80	0.80	0.88	1.07	1.34	1.92	1.25	
	Estimated Infiltration	0.70	0.47	0.76	1.11	0.27	0.03	0.00	0.00	0.08	0.27	0.54	1.12	0.45	
	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	0.15	0.28	0.20	0.06	0.03	0.06	0.02	0.02	0.04	0.09	0.13	0.31	0.11	

Table 4 - Estimated Community Wastewater Flow Components for 2014													9-Jun-15	PAGE 4	Average (MGD)
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Weymouth	Average Daily Flow	9.18	9.50	8.40	10.83	7.12	5.09	4.36	4.01	3.70	5.57	8.29	12.81	7.39	
	Dry Day Average Daily Flow	8.04	6.90	7.22	9.91	6.65	4.59	4.08	4.00	3.63	4.79	6.57	10.73	6.42	
	Estimated Infiltration	4.34	3.20	3.52	6.21	2.95	0.89	0.38	0.30	0.03	1.09	2.87	7.03	2.73	
	Estimated Sanitary Flow	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.60	3.70	3.70	3.69	
	Estimated Inflow	1.14	2.60	1.18	0.92	0.47	0.50	0.28	0.01	0.07	0.78	1.72	2.08	0.97	
Subtotal (Southern System)	Raw Average Daily Flow	127.62	116.35	128.79	161.31	111.00	84.41	78.36	68.09	62.54	81.17	109.52	175.69	108.72	
	Raw Dry Day Average Daily Flow	112.82	91.38	108.07	145.84	104.26	75.43	70.22	64.63	60.41	70.73	92.86	149.23	95.54	
	Raw Estimated Infiltration	60.37	38.93	55.62	93.39	51.81	22.98	17.77	12.18	8.31	18.28	40.41	96.78	43.12	
	MWRA Estimated Infiltration	7.24	3.36	5.20	9.33	5.24	1.51	2.03	1.67	1.00	2.35	4.50	10.95	4.55	
	Final Average Daily Flow	120.38	112.99	123.59	151.98	105.76	82.90	76.33	66.42	61.54	78.82	105.02	164.74	104.18	
	Final Dry Day Average Daily Flow	105.58	88.02	102.87	136.51	99.02	73.92	68.19	62.96	59.41	68.38	88.36	138.28	91.00	
	Final Estimated Infiltration	53.13	35.57	50.42	84.06	46.57	21.47	15.74	10.51	7.31	15.93	35.91	85.83	38.58	
	Estimated Sanitary Flow	52.45	52.45	52.45	52.45	52.45	52.45	52.45	52.45	52.10	52.45	52.45	52.45	52.42	
	Estimated Inflow	14.80	24.97	20.72	15.47	6.74	8.98	8.14	3.46	2.13	10.44	16.66	26.46	13.18	
South System Pump Station as Reported by NPDES	Average Daily Flow	130.80	122.90	136.40	170.30	116.90	92.30	85.70	73.20	67.70	85.80	113.20	178.20	114.42	

Table 4 - Estimated Community Wastewater Flow Components for 2014

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Annual
Average
(MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)		
Arlington	Raw Average Daily Flow	5.06	4.84	5.86	7.45	4.99	3.56	3.58	3.11	2.95	3.23	4.08	7.97	4.72		
	Raw Dry Day Average Daily Flow	4.64	4.19	4.93	6.75	4.80	3.19	3.09	2.88	2.85	3.01	3.63	6.61	4.22		
	Raw Estimated Infiltration	2.04	1.59	2.33	4.15	2.20	0.59	0.49	0.28	0.25	0.41	1.03	4.01	1.62		
	MWRA Estimated Infiltration	0.08	0.06	0.09	0.16	0.09	0.02	0.02	0.01	0.01	0.02	0.04	0.16	0.06		
	Final Average Daily Flow	4.98	4.78	5.77	7.29	4.90	3.54	3.56	3.10	2.94	3.21	4.04	7.81	4.66		
	Final Dry Day Average Daily Flow	4.56	4.13	4.84	6.59	4.71	3.17	3.07	2.87	2.84	2.99	3.59	6.45	4.15		
	Final Estimated Infiltration	1.96	1.53	2.24	3.99	2.11	0.57	0.47	0.27	0.24	0.39	0.99	3.85	1.55		
	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	0.42	0.65	0.93	0.70	0.19	0.37	0.49	0.23	0.10	0.22	0.45	1.36	0.51			
Bedford	Average Daily Flow	2.59	2.41	3.11	3.84	2.99	2.33	2.05	1.89	1.86	1.97	2.22	3.40	2.56		
	Dry Day Average Daily Flow	2.42	2.31	2.86	3.56	2.87	2.18	1.94	1.83	1.81	1.92	2.17	3.14	2.42		
	Estimated Infiltration	1.12	1.01	1.56	2.26	1.57	0.88	0.64	0.53	0.51	0.62	0.87	1.84	1.12		
	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	0.17	0.10	0.25	0.28	0.12	0.15	0.11	0.06	0.05	0.05	0.05	0.26	0.14		
Belmont	Average Daily Flow	2.95	2.61	3.73	4.81	2.90	2.23	2.34	1.95	1.82	2.03	2.52	5.43	2.95		
	Dry Day Average Daily Flow	2.53	2.04	2.97	4.51	2.68	2.08	2.11	1.73	1.73	1.80	2.05	4.11	2.53		
	Estimated Infiltration	0.93	0.44	1.37	2.91	1.08	0.48	0.51	0.13	0.13	0.20	0.45	2.51	0.93		
	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	0.42	0.57	0.76	0.30	0.22	0.15	0.23	0.22	0.09	0.23	0.47	1.32	0.42		
Boston (North Only)	Charlestown	Raw Average Daily Flow	3.49	3.42	2.74	3.53	3.17	2.73	2.88	2.54	2.28	3.07	2.97	4.36	3.10	
		Raw Dry Day Average Daily Flow	2.79	2.62	1.95	2.80	2.54	2.06	1.94	2.41	2.02	2.12	1.93	2.87	2.34	
		Raw Estimated Infiltration	1.09	0.92	0.25	1.10	0.84	0.36	0.24	0.71	0.32	0.42	0.23	1.17	0.64	
		MWRA Estimated Infiltration	0.17	0.14	0.04	0.17	0.13	0.06	0.04	0.11	0.05	0.07	0.04	0.18	0.10	
		Final Average Daily Flow	3.32	3.28	2.70	3.36	3.04	2.67	2.84	2.43	2.23	3.00	2.93	4.18	3.00	
		Final Dry Day Average Daily Flow	2.62	2.48	1.91	2.63	2.41	2.00	1.90	2.30	1.97	2.05	1.89	2.69	2.24	
		Final Estimated Infiltration	0.92	0.78	0.21	0.93	0.71	0.30	0.20	0.60	0.27	0.35	0.19	0.99	0.54	
		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	0.70	0.80	0.79	0.73	0.63	0.67	0.94	0.13	0.26	0.95	1.04	1.49	0.76	
		Columbus Park	Raw Average Daily Flow	35.24	34.71	34.50	37.28	29.80	28.62	32.26	26.57	23.75	31.35	33.33	41.73	32.43
			Raw Dry Day Average Daily Flow	29.14	27.16	28.18	31.34	25.73	27.19	27.17	24.53	22.89	23.18	26.09	31.55	27.01
Raw Estimated Infiltration	9.14		7.16	8.18	11.34	5.73	7.19	7.17	4.53	2.89	3.18	6.09	11.55	7.01		
MWRA Estimated Infiltration	0.29		0.22	0.26	0.35	0.18	0.22	0.22	0.14	0.09	0.10	0.19	0.36	0.22		
Final Average Daily Flow	34.95		34.49	34.24	36.93	29.62	28.40	32.04	26.43	23.66	31.25	33.14	41.37	32.21		
Final Dry Day Average Daily Flow	28.85		26.94	27.92	30.99	25.55	26.97	26.95	24.39	22.80	23.08	25.90	31.19	26.79		
Final Estimated Infiltration	8.85		6.94	7.92	10.99	5.55	6.97	6.95	4.39	2.80	3.08	5.90	11.19	6.79		
Estimated Sanitary Flow	20.00		20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00		
Estimated Inflow	6.10	7.55	6.32	5.94	4.07	1.43	5.09	2.04	0.86	8.17	7.24	10.18	5.42			
East Boston	Raw Average Daily Flow	6.48	6.40	6.11	6.43	5.89	5.43	5.10	3.74	3.45	4.97	5.35	7.20	5.54		
	Raw Dry Day Average Daily Flow	5.28	4.87	4.73	5.26	5.59	4.97	4.57	3.59	3.40	3.34	3.63	5.09	4.53		
	Raw Estimated Infiltration	1.98	1.57	1.43	1.96	2.29	1.67	1.27	0.29	0.10	0.04	0.33	1.79	1.23		
	MWRA Estimated Infiltration	0.18	0.15	0.13	0.18	0.21	0.15	0.12	0.03	0.01	0.00	0.03	0.17	0.11		
	Final Average Daily Flow	6.30	6.25	5.98	6.25	5.68	5.28	4.98	3.71	3.44	4.97	5.32	7.03	5.43		
	Final Dry Day Average Daily Flow	5.10	4.72	4.60	5.08	5.38	4.82	4.45	3.56	3.39	3.34	3.60	4.92	4.41		
	Final Estimated Infiltration	1.80	1.42	1.30	1.78	2.08	1.52	1.15	0.26	0.09	0.04	0.30	1.62	1.11		
	Estimated Sanitary Flow	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30		
Estimated Inflow	1.20	1.53	1.38	1.17	0.30	0.46	0.53	0.15	0.05	1.63	1.72	2.11	1.02			

Table 4 - Estimated Community Wastewater Flow Components for 2014											9-Jun-15		PAGE 6	Annual Average (MGD)
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Ward Street	Raw Average Daily Flow	32.86	34.82	35.13	38.56	32.11	28.83	31.07	27.48	27.48	32.52	32.90	37.93	32.63
	Raw Dry Day Average Daily Flow	31.30	30.13	31.89	35.83	30.11	25.71	25.57	25.47	25.11	28.63	27.64	30.09	28.95
	Raw Estimated Infiltration	6.30	5.13	6.89	10.83	5.11	0.71	0.57	0.47	0.11	3.63	2.64	5.09	3.95
	MWRA Estimated Infiltration	0.97	0.79	1.06	1.66	0.78	0.11	0.09	0.07	0.02	0.56	0.40	0.78	0.61
	Final Average Daily Flow	31.89	34.03	34.07	36.90	31.33	28.72	30.98	27.41	27.46	31.96	32.50	37.15	32.02
	Final Dry Day Average Daily Flow	30.33	29.34	30.83	34.17	29.33	25.60	25.48	25.40	25.09	28.07	27.24	29.31	28.34
	Final Estimated Infiltration	5.33	4.34	5.83	9.17	4.33	0.60	0.48	0.40	0.09	3.07	2.24	4.31	3.34
	Estimated Sanitary Flow	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
	Estimated Inflow	1.56	4.69	3.24	2.73	2.00	3.12	5.50	2.01	2.37	3.89	5.26	7.84	3.68
Boston (North Total)	Raw Average Daily Flow	78.07	79.35	78.48	85.80	70.97	65.61	71.31	60.33	56.96	71.91	74.55	91.22	73.70
	Raw Dry Day Average Daily Flow	68.51	64.78	66.75	75.23	63.97	59.93	59.25	56.00	53.42	57.27	59.29	69.60	62.83
	Raw Estimated Infiltration	18.51	14.78	16.75	25.23	13.97	9.93	9.25	6.00	3.42	7.27	9.29	19.60	12.83
	MWRA Estimated Infiltration	1.61	1.30	1.49	2.36	1.30	0.54	0.47	0.35	0.17	0.73	0.66	1.49	1.04
	Final Average Daily Flow	76.46	78.05	76.99	83.44	69.67	65.07	70.84	59.98	56.79	71.18	73.89	89.73	72.66
	Final Dry Day Average Daily Flow	66.90	63.48	65.26	72.87	62.67	59.39	58.78	55.65	53.25	56.54	58.63	68.11	61.79
	Final Estimated Infiltration	16.90	13.48	15.26	22.87	12.67	9.39	8.78	5.65	3.25	6.54	8.63	18.11	11.79
	Estimated Sanitary Flow	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
	Estimated Inflow	9.56	14.57	11.73	10.57	7.00	5.68	12.06	4.33	3.54	14.64	15.26	21.62	10.87
Brookline (North Only)	Average Daily Flow	3.18	3.93	3.67	3.91	3.44	3.44	3.66	2.91	2.75	3.04	3.22	4.04	3.43
	Dry Day Average Daily Flow	2.54	3.01	3.29	3.59	3.33	3.36	3.34	2.75	2.66	2.73	2.97	3.27	3.07
	Estimated Infiltration	0.24	0.71	0.99	1.29	1.03	1.06	1.04	0.45	0.36	0.43	0.67	0.97	0.77
	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	0.64	0.92	0.38	0.32	0.11	0.08	0.32	0.16	0.09	0.31	0.25	0.77	0.36
Burlington	Average Daily Flow	3.36	3.15	4.02	4.77	3.65	2.96	2.77	2.53	2.36	2.48	2.90	4.90	3.32
	Dry Day Average Daily Flow	3.14	2.94	3.56	4.37	3.55	2.75	2.58	2.39	2.27	2.37	2.78	4.44	3.10
	Estimated Infiltration	1.14	0.94	1.56	2.37	1.55	0.75	0.58	0.39	0.27	0.37	0.78	2.44	1.10
	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	0.22	0.21	0.46	0.40	0.10	0.21	0.19	0.14	0.09	0.11	0.12	0.46	0.23
Cambridge	Raw Average Daily Flow	17.96	17.75	19.22	19.99	16.71	16.20	18.91	15.98	16.29	19.10	20.13	26.14	18.71
	Raw Dry Day Average Daily Flow	14.75	13.61	15.42	17.25	14.47	14.30	14.88	14.60	15.09	15.57	15.86	18.26	15.35
	Raw Estimated Infiltration	3.75	2.61	4.42	6.25	3.47	3.30	3.88	3.60	4.09	4.57	4.86	7.26	4.35
	MWRA Estimated Infiltration	0.57	0.40	0.67	0.95	0.53	0.50	0.59	0.55	0.62	0.69	0.74	1.10	0.66
	Final Average Daily Flow	17.39	17.35	18.55	19.04	16.18	15.70	18.32	15.43	15.67	18.41	19.39	25.04	18.05
	Final Dry Day Average Daily Flow	14.18	13.21	14.75	16.30	13.94	13.80	14.29	14.05	14.47	14.88	15.12	17.16	14.69
	Final Estimated Infiltration	3.18	2.21	3.75	5.30	2.94	2.80	3.29	3.05	3.47	3.88	4.12	6.16	3.69
	Estimated Sanitary Flow	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
	Estimated Inflow	3.21	4.14	3.80	2.74	2.24	1.90	4.03	1.38	1.20	3.53	4.27	7.88	3.36
Chelsea	Raw Average Daily Flow	5.99	5.85	5.88	6.06	4.89	4.08	4.56	3.93	4.14	5.50	6.14	7.22	5.35
	Raw Dry Day Average Daily Flow	4.81	4.29	4.51	4.94	4.20	3.43	3.69	3.65	3.95	4.10	4.38	4.93	4.24
	Raw Estimated Infiltration	2.01	1.49	1.71	2.14	1.40	0.63	0.89	0.85	1.15	1.30	1.58	2.13	1.44
	MWRA Estimated Infiltration	0.22	0.16	0.19	0.23	0.15	0.07	0.10	0.09	0.13	0.14	0.17	0.23	0.16
	Final Average Daily Flow	5.77	5.69	5.69	5.83	4.74	4.01	4.46	3.84	4.01	5.36	5.97	6.99	5.20
	Final Dry Day Average Daily Flow	4.59	4.13	4.32	4.71	4.05	3.36	3.59	3.56	3.82	3.96	4.21	4.70	4.08
	Final Estimated Infiltration	1.79	1.33	1.52	1.91	1.25	0.56	0.79	0.76	1.02	1.16	1.41	1.90	1.28
	Estimated Sanitary Flow	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
	Estimated Inflow	1.18	1.56	1.37	1.12	0.69	0.65	0.87	0.28	0.19	1.40	1.76	2.29	1.11

Table 4 - Estimated Community Wastewater Flow Components for 2014

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Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average (MGD)
Everett	Average Daily Flow	5.61	5.57	5.28	6.09	4.27	4.73	4.49	3.94	3.26	4.02	4.81	7.71	4.98
	Dry Day Average Daily Flow	4.91	4.21	4.49	5.52	3.89	4.32	3.87	3.70	3.25	3.44	3.96	6.09	4.31
	Estimated Infiltration	1.41	0.71	0.99	2.02	0.39	0.82	0.37	0.20	0.05	0.04	0.46	2.59	0.84
	Estimated Sanitary Flow	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.20	3.40	3.50	3.50	3.47
	Estimated Inflow	0.70	1.36	0.79	0.57	0.38	0.41	0.62	0.24	0.01	0.58	0.85	1.62	0.67
Lexington	Raw Average Daily Flow	4.97	4.58	6.60	9.46	6.47	4.46	4.10	3.58	3.12	3.16	4.07	9.42	5.34
	Raw Dry Day Average Daily Flow	4.73	4.08	5.85	8.71	6.10	3.99	3.72	3.29	2.99	2.99	3.78	8.67	4.92
	Raw Estimated Infiltration	2.53	1.88	3.65	6.51	3.90	1.79	1.52	1.09	0.79	0.79	1.58	6.47	2.72
	MWRA Estimated Infiltration	0.28	0.21	0.40	0.72	0.43	0.20	0.17	0.12	0.09	0.09	0.17	0.72	0.30
	Final Average Daily Flow	4.69	4.37	6.20	8.74	6.04	4.26	3.93	3.46	3.03	3.07	3.90	8.70	5.04
	Final Dry Day Average Daily Flow	4.45	3.87	5.45	7.99	5.67	3.79	3.55	3.17	2.90	2.90	3.61	7.95	4.61
	Final Estimated Infiltration	2.25	1.67	3.25	5.79	3.47	1.59	1.35	0.97	0.70	0.70	1.41	5.75	2.41
	Estimated Sanitary Flow	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
	Estimated Inflow	0.24	0.50	0.75	0.75	0.37	0.47	0.38	0.29	0.13	0.17	0.29	0.75	0.42
Malden	Raw Average Daily Flow	10.26	9.49	10.15	11.96	9.30	8.11	8.55	7.47	6.88	7.80	9.84	14.39	9.52
	Raw Dry Day Average Daily Flow	9.31	7.96	8.96	11.32	8.88	7.59	7.51	7.10	6.64	7.17	8.77	12.12	8.62
	Raw Estimated Infiltration	4.11	2.76	3.76	6.12	3.68	2.39	2.31	1.90	1.44	1.97	3.57	6.92	3.42
	MWRA Estimated Infiltration	0.45	0.30	0.41	0.67	0.40	0.26	0.25	0.21	0.16	0.21	0.39	0.75	0.37
	Final Average Daily Flow	9.81	9.19	9.74	11.29	8.90	7.85	8.30	7.26	6.72	7.59	9.45	13.64	9.15
	Final Dry Day Average Daily Flow	8.86	7.66	8.55	10.65	8.48	7.33	7.26	6.89	6.48	6.96	8.38	11.37	8.24
	Final Estimated Infiltration	3.66	2.46	3.35	5.45	3.28	2.13	2.06	1.69	1.28	1.76	3.18	6.17	3.04
	Estimated Sanitary Flow	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20
Estimated Inflow	0.95	1.53	1.19	0.64	0.42	0.52	1.04	0.37	0.24	0.63	1.07	2.27	0.90	
Medford	Raw Average Daily Flow	9.11	8.68	9.57	11.52	8.12	6.46	7.33	6.12	5.52	6.47	8.16	13.17	8.35
	Raw Dry Day Average Daily Flow	7.69	6.84	8.10	10.50	7.53	6.01	5.85	5.58	5.17	5.72	6.87	8.67	7.04
	Raw Estimated Infiltration	3.19	2.34	3.60	6.00	3.03	1.51	1.35	1.08	0.67	1.22	2.37	4.17	2.54
	MWRA Estimated Infiltration	0.42	0.31	0.48	0.80	0.40	0.20	0.18	0.14	0.09	0.16	0.31	0.55	0.34
	Final Average Daily Flow	8.69	8.37	9.09	10.72	7.72	6.26	7.15	5.98	5.43	6.31	7.85	12.62	8.02
	Final Dry Day Average Daily Flow	7.27	6.53	7.62	9.70	7.13	5.81	5.67	5.44	5.08	5.56	6.56	8.12	6.71
	Final Estimated Infiltration	2.77	2.03	3.12	5.20	2.63	1.31	1.17	0.94	0.58	1.06	2.06	3.62	2.21
	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	1.42	1.84	1.47	1.02	0.59	0.45	1.48	0.54	0.35	0.75	1.29	4.50	1.31	
Melrose	Raw Average Daily Flow	5.58	4.85	5.27	7.72	5.00	3.98	4.41	3.75	3.06	3.77	5.19	10.22	5.24
	Raw Dry Day Average Daily Flow	4.84	3.75	4.35	7.27	4.77	3.65	3.56	3.30	3.00	3.20	4.36	7.89	4.50
	Raw Estimated Infiltration	2.94	1.85	2.45	5.37	2.87	1.75	1.66	1.40	1.10	1.30	2.46	5.99	2.60
	MWRA Estimated Infiltration	0.57	0.36	0.48	1.04	0.56	0.34	0.32	0.27	0.21	0.25	0.48	1.17	0.51
	Final Average Daily Flow	5.01	4.49	4.79	6.68	4.44	3.64	4.09	3.48	2.85	3.52	4.71	9.05	4.73
	Final Dry Day Average Daily Flow	4.27	3.39	3.87	6.23	4.21	3.31	3.24	3.03	2.79	2.95	3.88	6.72	4.00
	Final Estimated Infiltration	2.37	1.49	1.97	4.33	2.31	1.41	1.34	1.13	0.89	1.05	1.98	4.82	2.10
	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	0.74	1.10	0.92	0.45	0.23	0.33	0.85	0.45	0.06	0.57	0.83	2.33	0.74	
Milton (North Only)	Average Daily Flow	0.23	0.22	0.25	0.37	0.24	0.18	0.17	0.16	0.17	0.20	0.21	0.43	0.24
	Dry Day Average Daily Flow	0.21	0.19	0.21	0.35	0.22	0.17	0.16	0.16	0.17	0.18	0.19	0.39	0.22
	Estimated Infiltration	0.06	0.04	0.06	0.20	0.07	0.02	0.01	0.01	0.02	0.03	0.04	0.24	0.07
	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	0.04	0.02	0.02	0.01	0.01	0.00	0.00	0.02	0.02	0.04	0.02

Table 4 - Estimated Community Wastewater Flow Components for 2014

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Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Newton (North Only)	Average Daily Flow	5.93	5.95	7.36	9.70	6.90	6.13	5.53	5.47	5.18	4.74	5.15	9.31	6.45
	Dry Day Average Daily Flow	5.76	5.23	6.65	9.18	6.66	6.03	5.20	5.26	5.16	4.63	4.85	8.70	6.11
	Estimated Infiltration	1.86	1.33	2.75	5.28	2.76	2.13	1.30	1.36	1.26	0.73	0.95	4.80	2.21
	Estimated Sanitary Flow	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
	Estimated Inflow	0.17	0.72	0.71	0.52	0.24	0.10	0.33	0.21	0.02	0.11	0.30	0.61	0.33
Reading	Average Daily Flow	3.07	2.84	3.71	4.72	3.10	2.27	2.11	1.94	1.70	2.15	2.83	4.80	2.94
	Dry Day Average Daily Flow	2.75	2.49	3.14	4.35	2.94	2.08	1.90	1.76	1.63	2.00	2.68	4.17	2.66
	Estimated Infiltration	1.35	1.09	1.74	2.95	1.54	0.68	0.50	0.36	0.23	0.60	1.28	2.77	1.26
	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	0.32	0.35	0.57	0.37	0.16	0.19	0.21	0.18	0.07	0.15	0.15	0.63	0.28
Revere	Average Daily Flow	6.99	7.08	7.10	9.08	6.78	5.71	6.48	5.35	5.21	6.43	7.59	10.03	6.99
	Dry Day Average Daily Flow	5.80	5.25	6.04	7.92	6.05	5.37	5.34	5.04	4.96	5.21	5.78	6.98	5.81
	Estimated Infiltration	2.20	1.65	2.44	4.32	2.45	1.77	1.74	1.44	1.36	1.61	2.18	3.38	2.21
	Estimated Sanitary Flow	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
	Estimated Inflow	1.19	1.83	1.06	1.16	0.73	0.34	1.14	0.31	0.25	1.22	1.81	3.05	1.17
Somerville	Raw Average Daily Flow	11.10	10.91	11.69	12.72	9.96	8.04	10.46	7.73	7.35	9.93	11.69	18.02	10.81
	Raw Dry Day Average Daily Flow	8.17	7.43	8.13	9.83	8.05	6.90	6.73	6.18	6.64	6.63	7.47	10.10	7.69
	Raw Estimated Infiltration	2.87	2.13	2.83	4.53	2.75	1.60	1.43	0.88	1.34	1.33	2.17	4.80	2.39
	MWRA Estimated Infiltration	0.19	0.14	0.19	0.31	0.19	0.11	0.10	0.06	0.09	0.09	0.15	0.32	0.06
	Final Average Daily Flow	10.91	10.77	11.50	12.41	9.77	7.93	10.36	7.67	7.26	9.84	11.54	17.70	10.65
	Final Dry Day Average Daily Flow	7.98	7.29	7.94	9.52	7.86	6.79	6.63	6.12	6.55	6.54	7.32	9.78	7.53
	Final Estimated Infiltration	2.68	1.99	2.64	4.22	2.56	1.49	1.33	0.82	1.25	1.24	2.02	4.48	2.23
	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	2.93	3.48	3.56	2.89	1.91	1.14	3.73	1.55	0.71	3.30	4.22	7.92	3.12
Stoneham	Raw Average Daily Flow	3.82	3.17	4.06	5.05	3.24	2.57	2.81	2.53	2.20	2.62	3.19	6.66	3.50
	Raw Dry Day Average Daily Flow	3.32	2.65	3.44	4.60	3.18	2.30	2.24	2.20	2.14	2.26	2.66	5.46	3.04
	Raw Estimated Infiltration	1.72	1.05	1.84	3.00	1.58	0.70	0.64	0.60	0.54	0.66	1.06	3.86	1.44
	MWRA Estimated Infiltration	0.33	0.20	0.35	0.57	0.30	0.13	0.12	0.11	0.10	0.13	0.20	0.74	0.27
	Final Average Daily Flow	3.49	2.97	3.71	4.48	2.94	2.44	2.69	2.42	2.10	2.49	2.99	5.92	3.22
	Final Dry Day Average Daily Flow	2.99	2.45	3.09	4.03	2.88	2.17	2.12	2.09	2.04	2.13	2.46	4.72	2.77
	Final Estimated Infiltration	1.39	0.85	1.49	2.43	1.28	0.57	0.52	0.49	0.44	0.53	0.86	3.12	1.17
	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	0.50	0.52	0.62	0.45	0.06	0.27	0.57	0.33	0.06	0.36	0.53	1.20	0.46
Wakefield	Raw Average Daily Flow	3.98	3.61	5.66	6.42	4.31	3.15	3.20	2.89	2.34	2.88	4.03	8.30	4.24
	Raw Dry Day Average Daily Flow	3.57	3.07	4.92	5.86	4.09	2.85	2.75	2.55	2.19	2.55	3.46	6.87	3.73
	Raw Estimated Infiltration	2.07	1.57	3.42	4.36	2.59	1.35	1.25	1.05	0.69	1.05	1.96	5.37	2.23
	MWRA Estimated Infiltration	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.01
	Final Average Daily Flow	3.97	3.60	5.65	6.40	4.30	3.14	3.19	2.89	2.34	2.88	4.02	8.28	4.23
	Final Dry Day Average Daily Flow	3.56	3.06	4.91	5.84	4.08	2.84	2.74	2.55	2.19	2.55	3.45	6.85	3.73
	Final Estimated Infiltration	2.06	1.56	3.41	4.34	2.58	1.34	1.24	1.05	0.69	1.05	1.95	5.35	2.23
	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	0.41	0.54	0.74	0.56	0.22	0.30	0.45	0.34	0.15	0.33	0.57	1.43	0.50

Table 4 - Estimated Community Wastewater Flow Components for 2014											9-Jun-15		PAGE 9		Annual Average (MGD)
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Waltham	Raw Average Daily Flow	9.44	8.68	10.39	11.88	9.59	7.58	7.96	6.91	6.79	7.30	8.33	13.62	9.05	
	Raw Dry Day Average Daily Flow	8.83	7.80	9.67	11.32	9.22	7.05	7.10	6.58	6.53	6.77	7.72	12.07	8.40	
	Raw Estimated Infiltration	3.03	2.00	3.87	5.52	3.42	1.25	1.30	0.78	0.73	0.97	1.92	6.27	2.60	
	MWRA Estimated Infiltration	0.14	0.09	0.18	0.26	0.16	0.06	0.06	0.04	0.03	0.05	0.09	0.29	0.12	
	Final Average Daily Flow	9.30	8.59	10.21	11.62	9.43	7.52	7.90	6.87	6.76	7.25	8.24	13.33	8.93	
	Final Dry Day Average Daily Flow	8.69	7.71	9.49	11.06	9.06	6.99	7.04	6.54	6.50	6.72	7.63	11.78	8.27	
	Final Estimated Infiltration	2.89	1.91	3.69	5.26	3.26	1.19	1.24	0.74	0.70	0.92	1.83	5.98	2.47	
	Estimated Sanitary Flow	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	
	Estimated Inflow	0.61	0.88	0.72	0.56	0.37	0.53	0.86	0.33	0.26	0.53	0.61	1.55	0.65	
Watertown	Average Daily Flow	3.71	3.46	3.98	4.75	3.41	2.73	2.76	2.55	2.37	2.58	3.12	5.29	3.39	
	Dry Day Average Daily Flow	3.36	2.90	3.75	4.30	3.23	2.62	2.51	2.46	2.33	2.40	2.81	4.29	3.08	
	Estimated Infiltration	1.06	0.60	1.45	2.00	0.93	0.32	0.21	0.16	0.03	0.10	0.51	1.99	0.78	
	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	0.35	0.56	0.23	0.45	0.18	0.11	0.25	0.09	0.04	0.18	0.31	1.00	0.31	
Wilmington	Average Daily Flow	1.27	1.20	1.39	1.55	1.30	1.15	1.13	1.16	1.21	1.26	1.28	1.63	1.29	
	Dry Day Average Daily Flow	1.26	1.18	1.34	1.45	1.27	1.10	0.99	1.12	1.19	1.19	1.26	1.50	1.24	
	Estimated Infiltration	0.46	0.38	0.54	0.65	0.47	0.30	0.19	0.32	0.39	0.39	0.46	0.70	0.44	
	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	0.01	0.02	0.05	0.10	0.03	0.05	0.14	0.04	0.02	0.07	0.02	0.13	0.06	
Winchester	Average Daily Flow	2.36	2.14	3.08	3.60	2.52	1.72	1.74	1.43	1.33	1.50	1.86	4.14	2.29	
	Dry Day Average Daily Flow	2.16	1.90	2.63	3.25	2.42	1.61	1.51	1.33	1.32	1.39	1.70	3.58	2.07	
	Estimated Infiltration	1.06	0.80	1.53	2.15	1.32	0.51	0.41	0.23	0.22	0.29	0.60	2.48	0.97	
	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	0.20	0.24	0.45	0.35	0.10	0.11	0.23	0.10	0.01	0.11	0.16	0.56	0.22	
Winthrop	Average Daily Flow	2.07	2.06	2.02	2.30	1.91	1.77	1.76	1.55	1.38	1.76	2.00	2.55	1.93	
	Dry Day Average Daily Flow	1.70	1.60	1.70	1.99	1.77	1.65	1.53	1.52	1.32	1.45	1.59	1.99	1.65	
	Estimated Infiltration	0.60	0.50	0.60	0.89	0.67	0.55	0.43	0.42	0.22	0.35	0.49	0.89	0.55	
	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	0.37	0.46	0.32	0.31	0.14	0.12	0.23	0.03	0.06	0.31	0.41	0.56	0.28	
Woburn	Raw Average Daily Flow	9.14	8.81	9.67	10.94	8.41	6.59	6.87	5.28	4.73	5.52	6.34	11.01	7.77	
	Raw Dry Day Average Daily Flow	8.91	8.14	8.73	9.96	8.29	6.52	5.86	4.93	4.68	5.12	6.25	10.03	7.28	
	Raw Estimated Infiltration	4.41	3.64	4.23	5.46	3.79	2.02	1.36	0.43	0.18	0.62	1.75	5.53	2.78	
	MWRA Estimated Infiltration	0.63	0.52	0.60	0.78	0.54	0.29	0.19	0.06	0.03	0.09	0.25	0.79	0.40	
	Final Average Daily Flow	8.51	8.29	9.07	10.16	7.87	6.30	6.68	5.22	4.70	5.43	6.09	10.22	7.38	
	Final Dry Day Average Daily Flow	8.28	7.62	8.13	9.18	7.75	6.23	5.67	4.87	4.65	5.03	6.00	9.24	6.89	
	Final Estimated Infiltration	3.78	3.12	3.63	4.68	3.25	1.73	1.17	0.37	0.15	0.53	1.50	4.74	2.39	
	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	0.23	0.67	0.94	0.98	0.12	0.07	1.01	0.35	0.05	0.40	0.09	0.98	0.49	

Table 4 - Estimated Community Wastewater Flow Components for 2014													9-Jun-15	PAGE 10	Annual Average (MGD)
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Subtotal (Northern System)	Raw Average Daily Flow	217.80	213.19	231.20	266.46	205.37	177.74	191.04	162.44	152.93	183.35	205.45	301.02	209.06	
	Raw Dry Day Average Daily Flow	190.62	173.84	196.39	237.88	188.43	163.03	159.21	149.89	145.09	153.07	169.29	233.93	180.12	
	Raw Estimated Infiltration	66.67	49.89	72.44	113.93	64.48	39.08	35.26	25.94	21.44	29.22	45.34	109.98	56.20	
	MWRA Estimated Infiltration	5.50	4.06	5.54	8.87	5.06	2.73	2.58	2.01	1.73	2.65	3.66	8.33	4.40	
	Final Average Daily Flow	212.30	209.13	225.66	257.59	200.31	175.01	188.46	160.43	151.20	180.70	201.79	292.69	204.66	
	Final Dry Day Average Daily Flow	185.12	169.78	190.85	229.01	183.37	160.30	156.63	147.88	143.36	150.42	165.63	225.60	175.72	
	Final Estimated Infiltration	61.17	45.83	66.90	105.06	59.42	36.35	32.68	23.93	19.71	26.57	41.68	101.65	51.81	
	Estimated Sanitary Flow	123.95	123.95	123.95	123.95	123.95	123.95	123.95	123.95	123.95	123.85	123.95	123.95	123.92	
	Estimated Inflow	27.18	39.35	34.81	28.58	16.94	14.71	31.83	12.55	7.84	30.28	36.16	67.09	28.94	
Total (North and South)	Raw Average Daily Flow	345.42	329.54	359.99	427.77	316.37	262.15	269.40	230.53	215.47	264.52	314.97	476.71	317.78	
	Raw Dry Day Average Daily Flow	303.44	265.22	304.46	383.72	292.69	238.46	229.43	214.52	205.50	223.80	262.15	383.16	275.66	
	Raw Estimated Infiltration	127.04	88.82	128.06	207.32	116.29	62.06	53.03	38.12	29.75	47.50	85.75	206.76	99.33	
	MWRA Estimated Infiltration	12.74	7.42	10.74	18.20	10.30	4.24	4.61	3.68	2.73	5.00	8.16	19.28	8.94	
	Final Average Daily Flow	332.68	322.12	349.25	409.57	306.07	257.91	264.79	226.85	212.74	259.52	306.81	457.43	308.83	
	Final Dry Day Average Daily Flow	290.70	257.80	293.72	365.52	282.39	234.22	224.82	210.84	202.77	218.80	253.99	363.88	266.72	
	Final Estimated Infiltration	114.30	81.40	117.32	189.12	105.99	57.82	48.42	34.44	27.02	42.50	77.59	187.48	90.38	
	Estimated Sanitary Flow	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40	175.75	176.30	176.40	176.40	176.34	
	Estimated Inflow	41.98	64.32	55.53	44.05	23.68	23.69	39.97	16.01	9.97	40.72	52.82	93.55	42.11	
North System as Reported by NPDES	Average Daily Flow	220.60	216.60	238.10	272.60	205.90	183.90	198.90	170.30	159.80	192.10	210.60	308.70	214.92	
Total System as Reported by NPDES	Average Daily Flow	351.40	339.50	374.50	442.90	322.80	276.20	284.60	243.50	227.50	277.90	323.80	486.90	329.34	

Table 4 - Estimated Community Wastewater Flow Components for 2014											9-Jun-15		PAGE 11		Annual Average (MGD)
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Chelsea Creek	Average Daily Flow	100.66	94.05	110.67	133.58	97.00	80.75	87.63	73.08	68.64	81.55	93.31	154.95	98.06	
	Dry Day Average Daily Flow	84.50	75.06	89.36	115.82	87.74	72.47	70.05	67.01	63.77	67.79	75.85	120.05	82.52	
	Estimated Infiltration	35.80	26.36	40.66	67.12	39.04	23.77	21.35	18.31	15.37	19.19	27.15	71.35	33.86	
	Estimated Sanitary Flow	48.70	48.70	48.70	48.70	48.70	48.70	48.70	48.70	48.70	48.40	48.60	48.70	48.70	
	Estimated Inflow	16.16	18.99	21.31	17.76	9.26	8.28	17.58	6.07	4.87	13.76	17.46	34.90	15.54	
Columbus Park	Average Daily Flow	35.93	35.42	35.20	38.32	30.39	29.13	32.79	26.89	24.42	32.58	34.49	43.18	33.23	
	Dry Day Average Daily Flow	29.48	27.46	28.57	31.92	26.13	27.47	27.37	24.75	23.56	23.80	26.83	32.61	27.50	
	Estimated Infiltration	9.33	7.31	8.42	11.77	5.98	7.32	7.22	4.60	3.41	3.65	6.68	12.46	7.35	
	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	6.45	7.96	6.63	6.40	4.26	1.66	5.42	2.14	0.86	8.78	7.66	10.57	5.73	
Ward Street	Average Daily Flow	65.13	66.93	71.91	80.91	65.61	58.88	61.82	54.81	53.96	60.33	63.31	84.10	65.65	
	Dry Day Average Daily Flow	62.35	57.82	63.98	75.00	62.12	55.29	53.14	51.38	51.15	54.24	56.04	68.41	59.25	
	Estimated Infiltration	16.75	12.22	18.38	29.40	16.52	9.69	7.54	5.78	5.55	8.64	10.44	22.81	13.65	
	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	2.78	9.11	7.93	5.91	3.49	3.59	8.68	3.43	2.81	6.09	7.27	15.69	6.39	
Winthrop Terminal	Average Daily Flow	19.22	20.11	18.24	20.34	16.29	15.67	17.20	15.61	14.00	18.14	19.23	27.06	18.42	
	Dry Day Average Daily Flow	16.31	16.14	14.70	17.62	14.70	14.36	14.57	14.31	13.47	14.02	15.00	19.67	15.40	
	Estimated Infiltration	6.81	6.64	5.20	8.12	5.20	4.86	5.07	4.81	3.97	4.52	5.50	10.17	5.90	
	Estimated Sanitary Flow	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	
	Estimated Inflow	2.91	3.97	3.54	2.72	1.59	1.31	2.63	1.30	0.53	4.12	4.23	7.39	3.02	
Subtotal - Northern Headworks	Average Daily Flow	220.94	216.51	236.02	273.15	209.29	184.43	199.44	170.39	161.02	192.60	210.34	309.29	215.36	
	Dry Day Average Daily Flow	192.64	176.48	196.61	240.36	190.69	169.59	165.13	157.45	151.95	159.85	173.72	240.74	184.68	
	Estimated Infiltration	68.69	52.53	72.66	116.41	66.74	45.64	41.18	33.50	28.30	36.00	49.77	116.79	60.76	
	Estimated Sanitary Flow	123.95	123.95	123.95	123.95	123.95	123.95	123.95	123.95	123.65	123.85	123.95	123.95	123.92	
	Estimated Inflow	28.30	40.03	39.41	32.79	18.60	14.84	34.31	12.94	9.07	32.75	36.62	68.55	30.69	
Headworks as Reported by NPDES	SUM of ADF's	220.60	216.60	238.10	272.60	205.90	183.90	198.90	170.30	159.80	192.10	210.60	308.70	214.92	
Chelsea Creek	Average Daily Flow	100.30	93.90	111.70	132.60	95.30	80.20	87.10	72.70	67.70	81.10	93.30	154.30	97.59	
Columbus Park	Average Daily Flow	36.10	35.70	35.70	38.90	29.90	29.40	33.00	27.20	24.60	32.80	34.70	43.40	33.45	
Ward Street	Average Daily Flow	65.10	66.90	72.30	81.00	64.70	58.70	61.70	54.80	53.60	60.20	63.30	84.00	65.53	
Winthrop Terminal	Average Daily Flow	19.10	20.10	18.40	20.10	16.00	15.60	17.10	15.60	13.90	18.00	19.30	27.00	18.35	
Total System Flow (Southern Collection System Plus Northern Headworks)	Raw Average Daily Flow	348.56	332.86	364.81	434.46	320.29	268.84	277.80	238.48	223.56	273.77	319.86	484.98	324.09	
	Raw Dry Day Average Daily Flow	305.46	267.86	304.68	386.20	294.95	245.02	235.35	222.08	212.36	230.58	266.58	389.97	280.22	
	Raw Estimated Infiltration	129.06	91.46	128.28	209.80	118.55	68.62	58.95	45.68	36.61	54.28	90.18	213.57	103.88	
	MWRA Estimated Infiltration	7.24	3.36	5.20	9.33	5.24	1.51	2.03	1.67	1.00	2.35	4.50	10.95	4.55	
	Final Average Daily Flow	341.32	329.50	359.61	425.13	315.05	267.33	275.77	236.81	222.56	271.42	315.36	474.03	319.54	
	Final Dry Day Average Daily Flow	298.22	264.50	299.48	376.87	289.71	243.51	233.32	220.41	211.36	228.23	262.08	379.02	275.67	
	Final Estimated Infiltration	121.82	88.10	123.08	200.47	113.31	67.11	56.92	44.01	35.61	51.93	85.68	202.62	99.34	
	Estimated Sanitary Flow	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40	175.75	176.30	176.40	176.40	176.34	
	Estimated Inflow	43.10	65.00	60.13	48.26	25.34	23.82	42.45	16.40	11.20	43.19	53.28	95.01	43.87	

Table 4 - Estimated Community Wastewater Flow Components for 2014													9-Jun-15	PAGE 12	Annual Average (MGD)
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Boston (Total)	Raw Average Daily Flow	102.23	97.58	100.20	112.97	90.95	79.77	86.37	72.76	67.21	87.35	93.62	124.69	92.99	
	Raw Dry Day Average Daily Flow	89.89	77.91	83.47	99.95	81.41	69.76	70.75	67.03	63.11	69.52	75.07	98.17	78.86	
	Raw Estimated Infiltration	31.89	19.91	25.47	41.95	23.41	11.76	12.75	9.03	5.11	11.52	17.07	40.17	20.86	
	MWRA Estimated Infiltration	7.20	3.44	5.13	9.35	5.24	1.30	1.93	1.62	0.88	2.51	3.91	10.09	4.40	
	Final Average Daily Flow	95.03	94.14	95.07	103.62	85.71	78.47	84.44	71.14	66.33	84.84	89.71	114.60	88.59	
	Final Dry Day Average Daily Flow	82.69	74.47	78.34	90.60	76.17	68.46	68.82	65.41	62.23	67.01	71.16	88.08	74.47	
	Final Estimated Infiltration	24.69	16.47	20.34	32.60	18.17	10.46	10.82	7.41	4.23	9.01	13.16	30.08	16.47	
	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	12.34	19.67	16.73	13.02	9.54	10.01	15.62	5.73	4.10	17.83	18.55	26.52	14.12	
Brookline (Total)	Average Daily Flow	10.92	10.99	11.78	13.17	9.21	7.61	7.48	6.19	5.27	6.47	8.47	14.04	9.29	
	Dry Day Average Daily Flow	8.96	8.28	9.82	11.85	8.75	6.79	6.41	5.70	4.95	5.44	7.03	10.35	7.86	
	Estimated Infiltration	4.46	3.78	5.32	7.35	4.25	2.29	1.91	1.20	0.45	0.94	2.53	5.85	3.36	
	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	1.96	2.71	1.96	1.32	0.46	0.82	1.07	0.49	0.32	1.03	1.44	3.69	1.43	
Milton (Total)	Average Daily Flow	4.04	3.77	4.22	5.47	3.01	2.11	1.84	1.48	1.33	2.06	3.57	6.54	3.28	
	Dry Day Average Daily Flow	3.60	2.82	3.39	4.80	2.79	1.90	1.66	1.42	1.28	1.72	2.76	5.04	2.77	
	Estimated Infiltration	2.20	1.42	1.99	3.40	1.39	0.50	0.26	0.02	0.03	0.32	1.36	3.64	1.38	
	Estimated Sanitary Flow	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.25	1.40	1.40	1.40	1.39	
	Estimated Inflow	0.44	0.95	0.83	0.67	0.22	0.21	0.18	0.06	0.05	0.34	0.81	1.50	0.52	
Newton (Total)	Average Daily Flow	15.30	14.45	18.16	23.50	16.27	12.28	11.25	9.57	8.85	10.11	12.94	24.53	14.77	
	Dry Day Average Daily Flow	13.73	11.80	15.49	20.83	15.73	12.03	10.18	9.14	8.64	9.04	11.37	21.32	13.29	
	Estimated Infiltration	6.73	4.80	8.49	13.83	8.73	5.03	3.18	2.14	1.64	2.04	4.37	14.32	6.29	
	Estimated Sanitary Flow	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	
	Estimated Inflow	1.57	2.65	2.67	2.67	0.54	0.25	1.07	0.43	0.21	1.07	1.57	3.21	1.49	

Table 4 - Estimated Community Wastewater Flow Components for 2014											9-Jun-15	PAGE 13	Annual Average	
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	(MGD)
Subtotal Northern System CSO Communities Only: [Sum of Boston (North), Cambridge, Chelsea, and Somerville]	Raw Average Daily Flow	113.12	113.86	115.27	124.57	102.53	93.93	105.24	87.97	84.74	106.44	112.51	142.60	108.57
	Raw Dry Day Average Daily Flow	96.24	90.11	94.81	107.25	90.69	84.56	84.55	80.43	79.10	83.57	87.00	102.89	90.11
	Raw Estimated Infiltration	27.14	21.01	25.71	38.15	21.59	15.46	15.45	11.33	10.00	14.47	17.90	33.79	21.01
	MWRA Estimated Infiltration	2.59	2.00	2.54	3.85	2.17	1.22	1.26	1.05	1.01	1.65	1.72	3.14	2.02
	Final Average Daily Flow	110.53	111.86	112.73	120.72	100.36	92.71	103.98	86.92	83.73	104.79	110.79	139.46	106.55
	Final Dry Day Average Daily Flow	93.65	88.11	92.27	103.40	88.52	83.34	83.29	79.38	78.09	81.92	85.28	99.75	88.09
	Final Estimated Infiltration	24.55	19.01	23.17	34.30	19.42	14.24	14.19	10.28	8.99	12.82	16.18	30.65	18.99
	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	16.88	23.75	20.46	17.32	11.84	9.37	20.69	7.54	5.64	22.87	25.51	39.71	18.47	
Subtotal Northern System Without North CSO Communities:	Raw Average Daily Flow	104.68	99.33	115.93	141.89	102.84	83.81	85.80	74.47	68.19	76.91	92.94	158.42	100.48
	Raw Dry Day Average Daily Flow	94.38	83.73	101.58	130.63	97.74	78.47	74.66	69.46	65.99	69.50	82.29	131.04	90.01
	Raw Estimated Infiltration	39.53	28.88	46.73	75.78	42.89	23.62	19.81	14.61	11.44	14.75	27.44	76.19	35.20
	MWRA Estimated Infiltration	2.91	2.06	3.00	5.02	2.89	1.51	1.32	0.96	0.72	1.00	1.94	5.19	2.38
	Final Average Daily Flow	101.77	97.27	112.93	136.87	99.95	82.30	84.48	73.51	67.47	75.91	91.00	153.23	98.10
	Final Dry Day Average Daily Flow	91.47	81.67	98.58	125.61	94.85	76.96	73.34	68.50	65.27	68.50	80.35	125.85	87.63
	Final Estimated Infiltration	36.62	26.82	43.73	70.76	40.00	22.11	18.49	13.65	10.72	13.75	25.50	71.00	32.82
	Estimated Sanitary Flow	54.85	54.85	54.85	54.85	54.85	54.85	54.85	54.85	54.85	54.85	54.85	54.85	54.85
Estimated Inflow	10.30	15.60	14.35	11.26	5.10	5.34	11.14	5.01	2.20	7.41	10.65	27.38	10.47	
Subtotal North/South Systems Without North CSO Communities:	Raw Average Daily Flow	232.30	215.68	244.72	303.20	213.84	168.22	164.16	142.56	130.73	158.08	202.46	334.11	209.21
	Raw Dry Day Average Daily Flow	207.20	175.11	209.65	276.47	202.00	153.90	144.88	134.09	126.40	140.23	175.15	280.27	185.56
	Raw Estimated Infiltration	99.90	67.81	102.35	169.17	94.70	46.60	37.58	26.79	19.75	33.03	67.85	172.97	78.32
	MWRA Estimated Infiltration	10.15	5.42	8.20	14.35	8.13	3.02	3.35	2.63	1.72	3.35	6.44	16.14	6.93
	Final Average Daily Flow	222.15	210.26	236.52	288.85	205.71	165.20	160.81	139.93	129.01	154.73	196.02	317.97	202.28
	Final Dry Day Average Daily Flow	197.05	169.69	201.45	262.12	193.87	150.88	141.53	131.46	124.68	136.88	168.71	264.13	178.63
	Final Estimated Infiltration	89.75	62.39	94.15	154.82	86.57	43.58	34.23	24.16	18.03	29.68	61.41	156.83	71.39
	Estimated Sanitary Flow	107.30	107.30	107.30	107.30	107.30	107.30	107.30	107.30	107.30	106.65	107.20	107.30	107.24
Estimated Inflow	25.10	40.57	35.07	26.73	11.84	14.32	19.28	8.47	4.33	17.85	27.31	53.84	23.65	