

August 29, 2003

Ms. Linda Murphy
Director, Office of Ecosystem Protection
U.S. Environmental Protection Agency New England
P.O. Box 8127
Boston, MA 02114

Mr. Glenn Haas
Acting Assistant Commissioner
Bureau of Resource Protection
Department of Environmental Protection
One Winter Street
Boston, MA 02108

RE: Massachusetts Water Resources Authority NPDES Permit Number MA0103284

Dear Ms. Murphy and Mr. Haas:

In compliance with the requirements of MWRA's NPDES Permit MA0103284 - Part I, Item 18.bb (ii) "Infiltration/Inflow" (page 28 of 32), please find the enclosed Attachments:

Attachment 1 – Overview of MWRA Regional I/I Reduction Plan;

Attachment 2 – MWRA Regional Infiltration/Inflow Reduction Plan (September 2002);

Attachment 3 – MWRA Regional I/I Reduction Plan - FY03 Progress Update and Detailed Implementation Schedule for FY04 Activities;

Attachment 4 – MWRA Actions Taken to Reduce I/I During FY03;

Attachment 5 – Status Update on MWRA's I/I Local Financial Assistance Program;

Attachment 6 – I/I Reduction Status Update for Member Communities;

Attachment 7 – CY02 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: Eric Hall, US EPA
DEP-Regulatory Branch, Boston
Steven Lipman, DEP, Boston Harbor Coordinator
DEP – NERO, Boston
Richard Chretien, DEP, NERO
Grace Bigornia-Vitale, MWRA, NPDES Coordinator
Carl H. Leone, MWRA, Community Support Program

ATTACHMENT 1
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY03
Reporting Period – July 2002 Through June 2003

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 interim final plan (dated June 2001) was submitted to EPA and DEP under cover letter dated June 29, 2001. Following this submittal, MWRA received and responded to EPA and DEP comments through a variety of correspondence and meetings. DEP approved the final Regional I/I Reduction Plan (dated September 2002) in a letter dated November 19, 2002. A full copy of the final plan is included as Attachment 2.

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 FY03
Reporting Period – July 2002 Through June 2003

MWRA REGIONAL I/I REDUCTION PLAN
SEPTEMBER 2002

**MASSACHUSETTS WATER RESOURCES
AUTHORITY**



**REGIONAL INFILTRATION/INFLOW
REDUCTION PLAN**

SEPTEMBER 2002



REGIONAL INFILTRATION/INFLOW REDUCTION PLAN

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1. INTRODUCTION

1.1 BACKGROUND

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 Regional I/I Reduction Plan combines recommendations from the I/I Task Force Report with existing MWRA I/I reduction initiatives.

MWRA established its initial Regional I/I Reduction Strategy in 1990. The updated Regional Infiltration/Inflow Reduction Plan replaces the 1990 I/I Strategy. The 1990 I/I Strategy was approved by DEP (through an Interagency Agreement signed in April 1991) and served as the basis for MWRA interaction with member communities on I/I issues throughout the 1990s. The severe storm events in October 1996 and June 1998 led to the unusual circumstance of numerous sanitary sewer overflows (SSOs) from regional and local collection systems. In the aftermath of these events, EPA and DEP began an aggressive effort to require MWRA to regulate flows from community sewer systems. Alternatively, in an effort to define system problems, encourage dialogue, develop appropriate solutions and seek consensus, MWRA organized the regional I/I Task Force. The Regional I/I Reduction Plan combines recommendations from the I/I Task Force Report with existing MWRA I/I reduction initiatives.

1.2 DESCRIPTION OF THE REGIONAL I/I PROBLEM

Infiltration and inflow are groundwater and rainwater that enter the sewer systems of both MWRA and its member communities through a variety of defects. High levels of I/I consume capacity in the collection system that would otherwise be available to transport sanitary flow. During periods of high groundwater and large storm events, I/I entering the system causes sewer surcharging, wastewater backups into homes, and local overflows of untreated sewage, as well as increased operating costs.

The average annual wastewater flow contributed from the entire MWRA collection system varies, depending on annual precipitation, from about 335 to 425 mgd. I/I contributes more than half (55% to 65%) of the annual wastewater flow.

Infiltration and inflow are highest in the spring when: (1) rainfall is high (2) the groundwater table is high, (3) snowpack melts, (4) soil is generally more saturated (therefore a lower percentage of stormwater can infiltrate the ground), and (5) evapotranspiration is low. Infiltration and inflow are lowest in the late summer when: (1) rainfall is low (2) the groundwater table is low, (3) soil is generally dry (therefore a high percentage of stormwater can infiltrate the ground) and (4) evapotranspiration of surface and groundwater is high. Infiltration tends to increase and decrease gradually over the course of the year. Conversely, inflow causes a rapid increase in wastewater flow that occurs during and after storms leading to sewer system surcharging and sanitary sewer overflows (SSOs). The volume of inflow that enters the collection system typically depends on the magnitude and duration of a storm event, as



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well as related impacts such as snowmelt and storm tides. Few problems exist within the local and regional systems during dry weather or as a result of small and medium storm events (those below the DEP designated 1.7-inch–six hour “design” level). MWRA has a peak transport and treatment capacity of 1.2 billion gallons per day (more than 3 times the 380 mgd average flow).

1.3 MWRA INITIAL EFFORTS TOWARD I/I REDUCTION

The Enabling Act (Chapter 372, Acts of 1984) establishes as a goal of the MWRA the "reduction of infiltration and inflow for the service areas of the Authority..."; the Enabling Act further provides that the MWRA "shall also reasonably provide for abatement, reduction and prevention of infiltration and inflow of ground waters, surface waters or storm waters into the sewer system...." Additionally, the August 2000 NPDES Permit requires MWRA, in cooperation with its member communities, to eliminate excessive I/I to the MWRA sewer system.

MWRA’s Sewer Use Rules & Regulations (360 CMR 10.000) require new sewer systems and existing system replacements or extensions be designed and built to minimize I/I – “to the maximum extent possible.” The Sewer Rules also specifically prohibit the following discharges to the MWRA sewerage system: groundwater, storm water, surface waters, roof or surface runoff, tidewater, subsurface drainage (except as allowed by construction site dewatering permit in a CSO area), non-contact cooling or industrial process waters, and uncontaminated contact cooling or industrial process waters.

1.4 MWRA’s 1990 I/I REDUCTION STRATEGY

On August 1, 1990, the Board of Directors approved a regional I/I reduction strategy that (1) established MWRA as the lead agency to coordinate local I/I issues in the service area, and (2) focussed on I/I reduction and sewer system rehabilitation projects within the 43 member community systems. This management approach was intended to require relatively low capital investment by the MWRA through a best management practices approach. The following items were incorporated: design and construction of the wastewater metering system (completed in 1994), flow-based rate parameters (instituted in FY96), financial assistance for local I/I projects (initiated in 1993), technical and information assistance programs to support community efforts, assistance in establishment of local sewer enterprise funds, and agreement with DEP on minimum I/I reduction requirements for MWRA relief sewer projects. The strategy was developed to meet specific short, mid, and long-term goals, as detailed below.

Short-term goals were based on DEP required I/I reductions for MWRA southern sewer system relief projects. MWRA submitted final I/I reduction plans for each project to DEP in October 1995. Each submittal detailed I/I reduction projects implemented by member

communities and MWRA and identified that the minimum I/I reduction requirements had been achieved and that additional I/I efforts were ongoing. MWRA’s short-term goals were successfully completed.



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Mid-term goals were based on DEP required removal of 53 mgd of peak inflow from the southern collection system. In December 1995, MWRA submitted a final inflow reduction plan to DEP that detailed I/I reduction projects implemented by member communities and MWRA and identified that more than 53 mgd of peak inflow had been removed for the southern collection system. Also noted in the inflow reduction plan were additional projects that were being performed. MWRA's mid-term goals were successfully completed.

Long-term goals included the elimination of excessive I/I (i.e. I/I that is cost-effective or value-effective to remove per DEP's Guidelines for Performing I/I Analyses) from the regional collection system and ongoing repair/replacement of the local collection system. Significant progress has been made to establish programs aimed at meeting these long-term goals, including wastewater metering, flow-based rate parameters, local financial assistance, technical assistance, etc. These programs, as well as the goal of eliminating excessive I/I, are carried forward into the updated Regional I/I Reduction Plan.



2. I/I TASK FORCE

2.1 BACKGROUND

The Infiltration/Inflow (I/I) Task Force was a broad based coalition consisting of representatives of all 43 MWRA member sewer communities, MWRA Advisory Board, the Wastewater Advisory Committee to the MWRA, Charles River Watershed Association, Fore River Watershed Association, Mystic River Watershed Association, Neponset River Watershed Association, South Shore Chamber of Commerce, Massachusetts DEP, United States EPA, and MWRA. The I/I Task Force was organized by MWRA following discussions with EPA and DEP regarding regional I/I problems. MWRA believed a comprehensive approach to define regional I/I problems and to flesh out appropriate solutions (developed cooperatively by local collection system operators, as well as regulators and environmental advocates) would be more effective than a prescriptive, enforcement based approach. In December 1998 and February 1999, MWRA organized separate South and North System I/I Workshops that were attended by over 200 participants. Consensus was reached that a regional task force was the most effective way to move forward while allowing a broad range of stakeholders to be involved. As a result, MWRA organized the regional I/I Task Force to accomplish two objectives:

- A working group of all stakeholders was established to define system problems, encourage dialog, develop appropriate solutions, and seek consensus.
- Community-based recommendations for I/I and SSO reduction planning were documented in the March 2001 I/I Task Force Report, and were used as a basis to update/revise MWRA's Regional I/I Reduction Plan.

2.2 I/I TASK FORCE APPROACH

The Task Force Report outlines a regional I/I reduction plan based on specific goals and implementation strategies. The report is a guidance document for use by local communities, MWRA, DEP, as well as other regional stakeholders, who may tailor appropriate aspects of the report recommendations to their unique situations. Three important conclusions emerged from early Task Force discussions. First, in regard to regulation of the SSO "problem" by DEP and EPA, more information needed to be developed on the location and frequency of SSOs and backups, especially in community owned collection systems. Second, the establishment of numerical I/I reduction requirements and minimum operation and maintenance performance standards was not appropriate. Instead, the Task Force agreed to cooperatively develop a regional guidance document with recommended implementation strategies to fulfill specific goals. Third, the Task Force concluded that a "one size fits all" program to address varied local collection system problems is impractical; alternatively, the Task Force recommended each community tailor the most appropriate program elements to its specific situation.



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This approach is consistent with EPA's proposed national SSO Rules. EPA's proposed regulation on Capacity, Management, Operation and Maintenance (CMOM) of collection systems lists general standards that communities must consider. The draft regulation states: "If you believe that any element of this section is not appropriate or applicable to your CMOM program, your program does not need to address it, but your written summary must explain why that element is not applicable." The Task Force report provides communities and MWRA direction for meeting EPA's proposed SSO Rules.

2.3 MISSION STATEMENT, GOALS, AND IMPLEMENTATION STRATEGIES

The Task Force voted the following mission statement:

The I/I Task Force will develop goals and implementation strategies that will reduce Infiltration/Inflow to optimize local and regional sewer service. The Task Force will make recommendations for cooperative implementation of the goals and strategies by local communities, MWRA, DEP, EPA, and others.

Seven overall goals were identified and approved:

1. Eliminate all sewer system backups;
2. Minimize, with a long-term goal of eliminating, health and environmental impacts of sewer system overflows related to I/I;
3. Remove all (and prevent new) inflow sources from separate sanitary systems;
4. Minimize system-wide infiltration;
5. Educate and involve the public;
6. Develop an operation and maintenance program; and,
7. Improve funding mechanisms for identifying and removing I/I.

The first four goals are listed in order of highest to lowest priority. It is recommended that available resources be targeted to eliminate (or minimize) human health threats and loss of property due to sewer system backups and overflows. For instance, it is appropriate to construct interim measures (such as an emergency, manually operated SSO that directs sewage away from homes or a water supply) while long-term solutions (such as I/I reduction or relief sewers) are implemented. Goals 5 through 7 address critical issues that, because of their importance, were organized into individual goals.

The Task Force Report includes a summary of the discussion related to each of the seven goals. Also, for each goal, a list of specific implementation strategies is recommended. Each strategy details: (1) a recommended activity or action item, (2) who should be responsible for performing the activity; and (3) a recommended implementation schedule.

Copies of the I/I Task Force Report can be obtained from Kristen Hall, Project Manager, MWRA Community Support Program, (617) 788-4831 (email: Kristen.Hall@mwra.state.ma.us).



3. REGIONAL I/I REDUCTION PLAN

3.1 BOARD OF DIRECTORS' APPROVAL

The MWRA Board of Directors approved the Regional Infiltration/Inflow 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 Regional I/I Reduction Plan combines recommendations from the I/I Task Force Report with existing MWRA I/I reduction initiatives. The Staff Summary presented to the board of Directors is provided as Appendix A.

3.2 OVERVIEW OF THE PLAN

Under the updated 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:

- GOAL 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.*
- GOAL 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.*
- GOAL 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.*
- GOAL 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.*
- GOAL 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.*



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Details of each of the five goals and implementation schedules are presented in the sections that follow.

3.3 ROLES AND RESPONSIBILITIES FOR REGIONAL STAKEHOLDERS

Appropriate roles and responsibilities for MWRA regarding regional I/I reduction activities are those detailed within this Plan. Appropriate roles and responsibilities for service area communities are detailed within the March 2001 I/I Task Force Report. Consistent with I/I Task Force recommendations, the roles and responsibilities listed below are unsuitable for MWRA or local communities, but are appropriate for DEP and/or other state or federal agencies.

- Management and oversight of local sewer system planning, master planning, comprehensive water resources planning, planning for growth, local sewer extension and connection permitting, mitigation of new sanitary flows, interbasin transfer permitting, etc.
- Regulatory and enforcement regarding SSOs from community-owned sewers (administrative orders, consent orders, etc.) that are not related to an MWRA operation and maintenance problem.
- Issuance of regulations or guidance documents covering statewide sewer system issues, including: I/I reduction guidelines, threshold limits for acceptable or excessive I/I, sewer system operation and maintenance guidelines, sewer inspection and/or testing standards, sewer construction standards, regulatory/enforcement measures to remove private inflow sources, plumbing code revisions, etc.

3.4 IMPLEMENTATION SCHEDULE

The I/I Task Force established an implementation schedule for each I/I reduction strategy recommended in the report utilizing “short-term”, “mid-term”, and “long-term” time frames. MWRA has established a similar implementation schedule for I/I reduction strategies in the Regional I/I Reduction Plan. The implementation schedule is defined as follows:

- Short-term: Strategies defined as “short-term” are expected to be completed not more than one to two years after the MWRA Regional I/I Reduction Plan is approved by EPA and MADEP.
- Mid-term: Strategies defined as “mid-term” are expected to be completed not more than two to four years after the MWRA Regional I/I Reduction Plan is approved by EPA and MADEP.
- Long-term: Strategies defined as “long-term” are expected to be completed not more than four to five years after the MWRA Regional I/I Reduction Plan is approved by EPA and MADEP.



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- Ongoing: Strategies defined as “ongoing” are recommended to be accomplished on an annual basis or are expected to continue to be accomplished over an extended period after completion of an initial project component. This schedule is dependent on the approval of the MWRA Regional I/I Reduction Plan by EPA and MADEP.

This implementation schedule utilizing “short-term”, “mid-term”, “long-term”, and “ongoing” time frames has been developed to provide some flexibility in establishing priorities as the various strategies under the Regional I/I Reduction Plan are completed. Included within the written description of each I/I reduction strategy is the descriptive implementation schedule.

A more detailed implementation schedule that expands on the “short-term”, “mid-term”, “long-term”, and “ongoing” time frames has been developed and is presented as Appendix B. The implementation schedule for each I/I reduction strategy is presented as a bar graph with specific start and completion points noted. This more detailed implementation schedule assumes EPA and MADEP approve the MWRA Regional I/I Reduction Plan on or about January 2003. Progress on implementing each strategy will be reported by MWRA to EPA and MADEP within the I/I reduction summary report submitted annually (by September 1), as required under the NPDES Permit.

3.5 GOAL 1 – O&M PROGRAM FOR THE MWRA-OWNED INTERCEPTOR SYSTEM

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.

This effort will consist of:

- Continuing appropriately phased manhole and internal TV inspection programs of 100 percent of the MWRA-owned interceptor system and a priority ranking system for scheduling rehabilitation of identified problems.
- Continuing a suitable annual budget to fund rehabilitation of priority projects.

Some of the specific strategies to accomplish this goal are detailed within MWRA’s Collection System O&M Manual and include:

Strategy A: Utilize MWRA’s state of the art internal TV inspection equipment that currently includes three fully outfitted internal TV inspection vehicles equipped with 6000 feet of multi-conductor cable. MWRA has also recently purchased 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.



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Strategy B: Utilize MWRA's state of the art 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.

3.6 GOAL 2 – ELIMINATE SEWER SYSTEM BACKUPS INTO HOMES AND OTHER BUILDINGS AND MINIMIZE HEALTH AND ENVIRONMENTAL IMPACTS OF SSOs RELATED TO I/I

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.

This effort will consist of:

- Providing technical assistance to DEP to develop a uniform format for use by MWRA and its member communities for reporting and recordkeeping of sewer backups and SSOs. The database from this effort may be linked to MWRA's GIS mapping to better define chronic problem areas.
- Prioritizing areas "at risk" for backups and SSOs, analyzing existing health and environmental impacts, and evaluating potential interim mitigation measures (such as emergency overflow structures) and long-term improvements (I/I reduction and/or relief sewer projects) to the MWRA-owned interceptor system. Also, providing technical assistance to member communities (in coordination with watershed groups, plumbing inspectors, etc.) as they perform the same type of activities for their local systems.

Some of the specific strategies to accomplish this goal include:

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.



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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)

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 which 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)

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)

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)

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)

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



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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)

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)

3.7 GOAL 3 – REDUCE I/I IN THE REGIONAL COLLECTION SYSTEM

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.

This effort will consist of:

- Continuing to analyze wastewater metering data to estimate community I/I and provide this information to member communities. Also, increasing coordination with member communities before and during extreme storms and consider expanding the existing metering - emergency notification system.
- Continuing to provide technical assistance to member communities to establish local I/I removal programs, prioritize projects, evaluate rehabilitation options, etc.
- Continuing to fund the I/I Local Financial Assistance Program and providing assistance to member communities for emergency sewer services (such as cleaning, bypass pumping, TV inspection, etc.).
- As required under MWRA's NPDES Permit, staff have considered the merits of revisions to the current flow-based sewer rate methodology developed by the Advisory Board Rates Committee in 1994-95. The current sewer charge system is efficient and effective, therefore, staff recommend no modifications.



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Some of the specific strategies to accomplish this goal include:

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)

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)

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)

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)



REGIONAL INFILTRATION/INFLOW REDUCTION PLAN

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. Through June 2001, MWRA has authorized a total budget of \$100.75 million to fund this program. As of July 2001, an additional \$40 million in 45 percent grants and 55 percent interest-free loans has been authorized by the Board of Directors, bringing the total program budget to \$140.75 million. The program is approved 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)

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)

3.8 GOAL 4 – EDUCATE AND INVOLVE THE PUBLIC

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

This effort will consist of:

- Continuing to act as a “clearinghouse” to develop, collect and distribute educational materials; posting educational material on the MWRA web site; developing press releases; organizing (jointly with DEP) periodic demonstration projects and/or workshops; providing information to regional groups, local organizations, and plumbing inspectors; developing links between stakeholder internet sites; developing school education program materials; and informing regional stakeholders on progress to increase state and federal funding; etc.

Some of the specific strategies to accomplish this goal include:

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.



REGIONAL INFILTRATION/INFLOW REDUCTION PLAN

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)

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)

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 are currently organizing a joint workshop on private source inflow reduction. 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)

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)

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



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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)

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)

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)

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)

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)



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3.9 GOAL 5 – PROVIDE TECHNICAL ASSISTANCE AND WORK COOPERATIVELY WITH MEMBER COMMUNITIES, DEP, AND EPA REGARDING GUIDANCE ON LOCAL OPERATION AND MAINTENANCE AND CAPITAL IMPROVEMENT PROGRAMS

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.

This effort will consist of:

- Providing review comments when the current DEP sewer operation and maintenance guidelines are updated.
- Providing the I/I Task Force Report (which includes recommendations for sewer system operation and maintenance) to all member communities, reviewing local sewer use regulations, and recommending improvements.
- Providing member communities a generic wastewater collection system operation and maintenance manual and SSO response plan that can be used as a template to meet pending EPA SSO Rules.

Some of the specific strategies to accomplish this goal include:

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.

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)

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.



REGIONAL INFILTRATION/INFLOW REDUCTION PLAN

APPENDIX A

May 23, 2001 Staff Summary on Updated Regional I/I Reduction Plan

WWA.1
IV A.3
5/23/01

STAFF SUMMARY


TO: Board of Directors
FROM: Barbara S. Gottschalk, Interim Executive Director
DATE: May 23, 2001
SUBJECT: Updated Regional I/I Reduction Plan



COMMITTEE: Wastewater Policy and Oversight

INFORMATION

CHL Carl H. Leone, Senior Program Manager, Community Support
Preparer/Title


Michael J. Hornbrook
Chief Operating Officer

RECOMMENDATION:

That the Board of Directors approve the Updated Regional Infiltration/Inflow (I/I) Reduction Plan and authorize staff to submit the Plan to EPA and DEP (by the end of June 2001) as required under MWRA's NPDES Permit and to authorize staff to negotiate with DEP on an Interagency Agreement concerning regional I/I reduction and SSO issues. Staff are directed to report to the Board on progress concerning these negotiations.

BACKGROUND:

Introduction

MWRA established its current Regional I/I Reduction Strategy in 1990. The 1990 I/I Strategy was approved by DEP (through an Interagency Agreement signed in April 1991) and served as the basis for MWRA interaction with member communities on I/I issues throughout the 1990s. The severe storm events in October 1996 and June 1998 led to the unusual circumstance of numerous sanitary sewer overflows (SSOs) from regional and local collection systems. In the aftermath of these events, EPA and DEP began an aggressive effort to require MWRA to regulate flows from community sewer systems. Alternatively, in an effort to define system problems, encourage dialogue, develop appropriate solutions and seek consensus, MWRA organized the regional I/I Task Force. The proposed Updated Regional I/I Reduction Plan combines recommendations from the I/I Task Force Report with existing MWRA I/I reduction initiatives.

Description of the Regional I/I Problem

Infiltration and inflow are groundwater and rainwater that enter the sewer systems of both MWRA and its member communities through a variety of defects. High levels of I/I consume capacity in the collection system that would otherwise be available to transport sanitary flow. During periods of high groundwater and large storm events, I/I entering the system causes sewer surcharging, wastewater backups into homes, and local overflows of untreated sewage, as well as increased operating costs.

The average annual wastewater flow contributed from the entire MWRA collection system varies, depending on annual precipitation, from about 335 to 425 mgd. I/I contributes more than half (55% to 65%) of the annual wastewater flow.

Infiltration and inflow are highest in the spring when the groundwater table is high, soil is generally more saturated, and a lower percentage of stormwater can infiltrate the ground. Infiltration and inflow are lowest in the late summer when the groundwater table is low, soil is generally dry, and a high percentage of stormwater can infiltrate the ground or be lost through evapotranspiration. Infiltration tends to increase and decrease gradually over the course of the year. Conversely, inflow causes a rapid increase in wastewater flow that occurs during and after storms leading to sewer system surcharging and sanitary sewer overflows (SSOs). The volume of inflow that enters the collection system typically depends on the magnitude and duration of a storm event, as well as related impacts such as snowmelt and storm tides.

Few problems exist within the local and regional systems during dry weather or as a result of small and medium storm events (those below the 1.7-inch "design" level). MWRA has a peak transport and treatment capacity of 1.2 billion gallons per day (more than 3 times the 380 mgd average flow).

MWRA Initial Efforts Toward I/I Reduction

The Enabling Act establishes as a goal of the MWRA the "reduction of infiltration and inflow for the service areas of the Authority..."; the Enabling Act further provides that the MWRA "shall also reasonably provide for abatement, reduction and prevention of infiltration and inflow of ground waters, surface waters or storm waters into the sewer system..." Additionally, the July 2000 NPDES Permit requires MWRA, in cooperation with its member communities, to eliminate "excessive" I/I.

MWRA's Sewer Use Rules & Regulations require new sewer systems and existing system replacements or extensions be designed and built to minimize I/I – "to the maximum extent possible." The Sewer Rules also specifically prohibit the following discharges to the MWRA sewerage system: groundwater, storm water, surface waters, roof or surface runoff, tidewater, subsurface drainage (except as allowed by construction site dewatering permit in a CSO area), non-contact cooling or industrial process waters, and uncontaminated contact cooling or industrial process waters.

MWRA's 1990 I/I Reduction Strategy

On August 1, 1990, the Board of Directors approved a regional I/I reduction strategy that (1) established MWRA as the lead agency to coordinate local I/I issues, and (2) focussed on I/I reduction and sewer system rehabilitation projects within the 43 member community systems. This management approach was intended to require relatively low capital investment by the MWRA through a best management practices approach. The following items were incorporated: design and construction of the wastewater metering system (constructed in 1994), flow-based rate parameters (instituted in FY96), financial assistance for local I/I projects (initiated in 1994), technical and information assistance programs to support community efforts, assistance in establishment of local sewer enterprise funds, and agreement with DEP on minimum I/I

reduction requirements for MWRA relief sewer projects. The strategy was developed to meet specific short, mid, and long-term goals, many of which have been substantially completed.

Short-term goals were based on DEP required I/I reductions for MWRA southern sewer system relief projects. MWRA submitted final I/I reduction plans for each project to DEP in October 1995. Each submittal detailed I/I reduction projects implemented by member communities and MWRA and identified that the minimum I/I reduction requirements had been achieved and that additional I/I efforts were ongoing.

Mid-term goals were based on DEP required removal of 53 mgd of peak inflow from the southern collection system. In December 1995, MWRA submitted a final inflow reduction plan to DEP that detailed I/I reduction projects implemented by member communities and MWRA and identified that more than 53 mgd of peak inflow had been removed for the southern collection system. Also noted in the inflow reduction plan were additional projects that were being performed.

Long-term goals included the elimination of excessive (i.e. cost-effective) I/I from the regional collection system and ongoing repair/replacement of the local collection system. Significant progress has been made to establish programs aimed at meeting these long-term goals, including wastewater metering, flow-based rate parameters, local financial assistance, technical assistance, etc. These programs, as well as the goal of eliminating excessive I/I, are carried forward into the Updated Regional I/I Reduction Plan.

DISCUSSION:

Updated Regional I/I Reduction Plan

The proposed Updated Regional I/I Reduction Plan combines recommendations from the recent I/I Task Force Report with existing MWRA I/I reduction initiatives. Under the updated 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 Updated 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. This program consists of:

Continuing appropriately phased manhole and internal TV inspection programs of 100 percent of the MWRA-owned interceptor system and a priority ranking system for scheduling rehabilitation of identified problems.

- Continuing a suitable annual budget to fund rehabilitation of priority projects.

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. This effort will consist of:

Providing technical assistance to DEP to develop a uniform format for use by MWRA and its member communities for reporting and recordkeeping of sewer backups and SSOs. The database from this effort may be linked to MWRA's GIS mapping to better define chronic problem areas.

Prioritizing areas "at risk" for backups and SSOs, analyzing existing health and environmental impacts, and evaluating potential interim mitigation measures (such as emergency overflow structures) and long-term improvements (I/I reduction and/or relief sewer projects) to the MWRA-owned interceptor system. Also, providing technical assistance to member communities (in coordination with watershed groups, plumbing inspectors, etc.) as they perform the same type of activities for their local systems.

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. MWRA efforts will consist of:

- Continuing to analyze wastewater metering data to estimate community I/I and provide this information to member communities. Also, increase coordination with member communities before and during extreme storms and consider expanding the existing emergency notification metering system.
- Continuing to provide technical assistance to member communities to establish local I/I removal programs, prioritize projects, evaluate rehabilitation options, etc.

Continuing to fund the I/I Local Financial Assistance Program and to provide assistance to member communities for emergency services (such as cleaning, bypass pumping, TV inspection, etc.). To support this program, a recommendation for an additional \$40 million is included in the proposed FY02-04 CIP. MWRA staff will continue to work with the Advisory Board to explore alternatives to maximize the efficient use of community assistance resources.

- As required under MWRA's NPDES Permit, staff have considered the merits of revisions to the current flow-based sewer rate methodology developed by the Advisory Board Rates Committee in 1994-95. The current sewer charge system is efficient and effective, therefore, staff recommend no modifications.

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, including:

Continuing to act as a "clearinghouse" to develop, collect and distribute educational materials; posting educational material on the MWRA web site; developing press

releases; organizing (jointly with DEP) periodic demonstration projects and/or workshops; providing information to regional groups, local organizations, and plumbing inspectors; developing links between stakeholder internet sites; developing school education program materials; and informing regional stakeholders on progress to increase state and federal funding; etc.

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. This effort will consist of:

Providing review comments when the current DEP sewer operation and maintenance guidelines are updated.

- Providing the I/I Task Force Report (which includes recommendations for sewer system operation and maintenance) to all member communities, reviewing local sewer use regulations, and recommending improvements.

Providing member communities a generic wastewater collection system operation and maintenance manual and SSO response plan that can be used as a template to meet pending EPA SSO Rules.

Interagency Agreement Between DEP and MWRA

As noted in the February 1999 Braintree/Weymouth Administrative Consent Order and the MWRA's July 2000 NPDES Permit, DEP and MWRA have agreed to enter into an Interagency Agreement concerning regional I/I reduction and SSO issues (by July 31, 2001). Negotiations leading to an Interagency Agreement are expected to include discussion of appropriate roles and responsibilities among member communities, MWRA and DEP, including regulatory and enforcement issues. As negotiations with DEP progress, staff will provide updates to the Board.

Staff will propose to DEP that the appropriate roles and responsibilities for MWRA are those outlined within the Updated Regional I/I Reduction Plan. Staff will further propose to DEP that, consistent with I/I Task Force recommendations, the roles and responsibilities listed below are unsuitable for MWRA, but appropriate for DEP and/or other state or federal agencies.

RECOMMENDATIONS FOR DEP/EPA RESPONSIBILITIES

- Management and oversight of local sewer system planning, master planning, comprehensive water resources planning, planning for growth, local sewer extension and connection permitting, mitigation of new sanitary flows, interbasin transfer permitting, etc.
- Regulatory and enforcement issues regarding SSOs from community-owned sewers (including 19 existing DEP Administrative Orders) that are not related to an MWRA operation and maintenance problem.
- Issuance of regulations or guidance documents covering statewide sewer system issues, including: I/I reduction guidelines, threshold limits for acceptable or excessive I/I, sewer system operation and maintenance guidelines, sewer inspection and/or testing standards, sewer construction standards, new enforcement measures to remove private inflow sources, plumbing codes, etc.
- Increases to funding available for I/I and SSO reduction projects under the SRF program.

BUDGET/FISCAL IMPACT:

The proposed Updated Regional I/I Reduction Plan is intended to continue the best management practices approach requiring a relatively low capital investment by the MWRA beyond the current level. However, it is likely that DEP will request MWRA implement and/or fund additional I/I reduction activities over and above those recommended by the I/I Task Force and incorporated in the proposed Plan.

Two existing Programs within the CIP directly involve regional I/I reduction planning:

- The \$100 million I/I Local Financial Assistance Program provides grant and loan funding for local I/I reduction projects. A total of \$65 million has been distributed, and an additional \$40 million is recommended in the FY02 – 04 CIP.
- The \$500,000 Regional I/I Management Planning Project will develop documents for submittal to EPA to satisfy portions of the Authority's NPDES permit conditions.

These programs are managed by the Community Support Program within the Planning Department. This group has 8 staff members. Approximately 40% of staff time, or the equivalent of three full time employees, is spent administering the I/I Local Financial Assistance Program and the Regional I/I Management Planning Project. At this time, no substantial increase in level of effort is expected over the long term.



REGIONAL INFILTRATION/INFLOW REDUCTION PLAN

APPENDIX B

Implementation Schedule for MWRA Regional I/I Reduction Plan

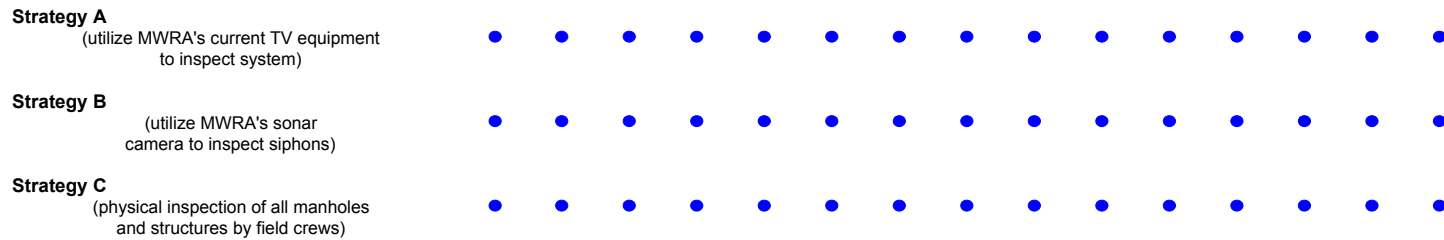
Implementation Schedule for MWRA Regional I/I Reduction Plan

This detailed implementation schedule assumes EPA and MA DEP approve the MWRA Regional I/I Reduction Plan on or about January 2003

Short-Term
 Mid-Term
 Long-Term
 Previously Initiated
 Start
 Complete
 Ongoing

Jul-01 Jan-02 Jul-02 Jan-03 Jul-03 Jan-04 Jul-04 Jan-05 Jul-05 Jan-06 Jul-06 Jan-07 Jul-07 Jan-08 Jul-08

Goal 1 O&M Program for the MWRA-Owned Interceptor System

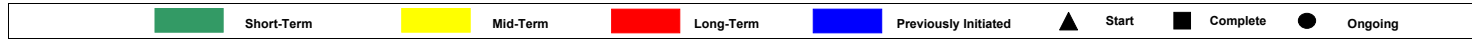


Goal 2 Eliminate Sewer System Backups Into Homes and Other Buildings and Minimize Health and Environmental Impacts of SSOs Related to I/I



Implementation Schedule for MWRA Regional I/I Reduction Plan

This detailed implementation schedule assumes EPA and MA DEP approve the MWRA Regional I/I Reduction Plan on or about January 2003



Jul-01 Jan-02 Jul-02 Jan-03 Jul-03 Jan-04 Jul-04 Jan-05 Jul-05 Jan-06 Jul-06 Jan-07 Jul-07 Jan-08 Jul-08

Strategy G
(assist DEP in educating plumbing inspectors of priority of eliminating backups)



Goal 3 Reduce I/I in the Regional Collection System

Strategy A
(continue to analyze metering data to estimate community I/I rates)



Strategy B
(evaluate feasibility of developing & operating an expanded emergency notification system)



Strategy C
(provide tech assistance to communities re: written I/I identification & removal programs)



Strategy D
(provide tech assistance to communities to emphasize infiltration removal that impacts water resource areas)



Strategy E
(continue to fund the I/I Local Financial Assistance Program)



Strategy F
(continue to provide emergency assistance to communities for sewer services)



Goal 4 Educate and Involve the Public

Strategy A
(act as a "clearinghouse" for info on I/I and SSOs)



Strategy B
(develop and distribute summary of previously distributed information)

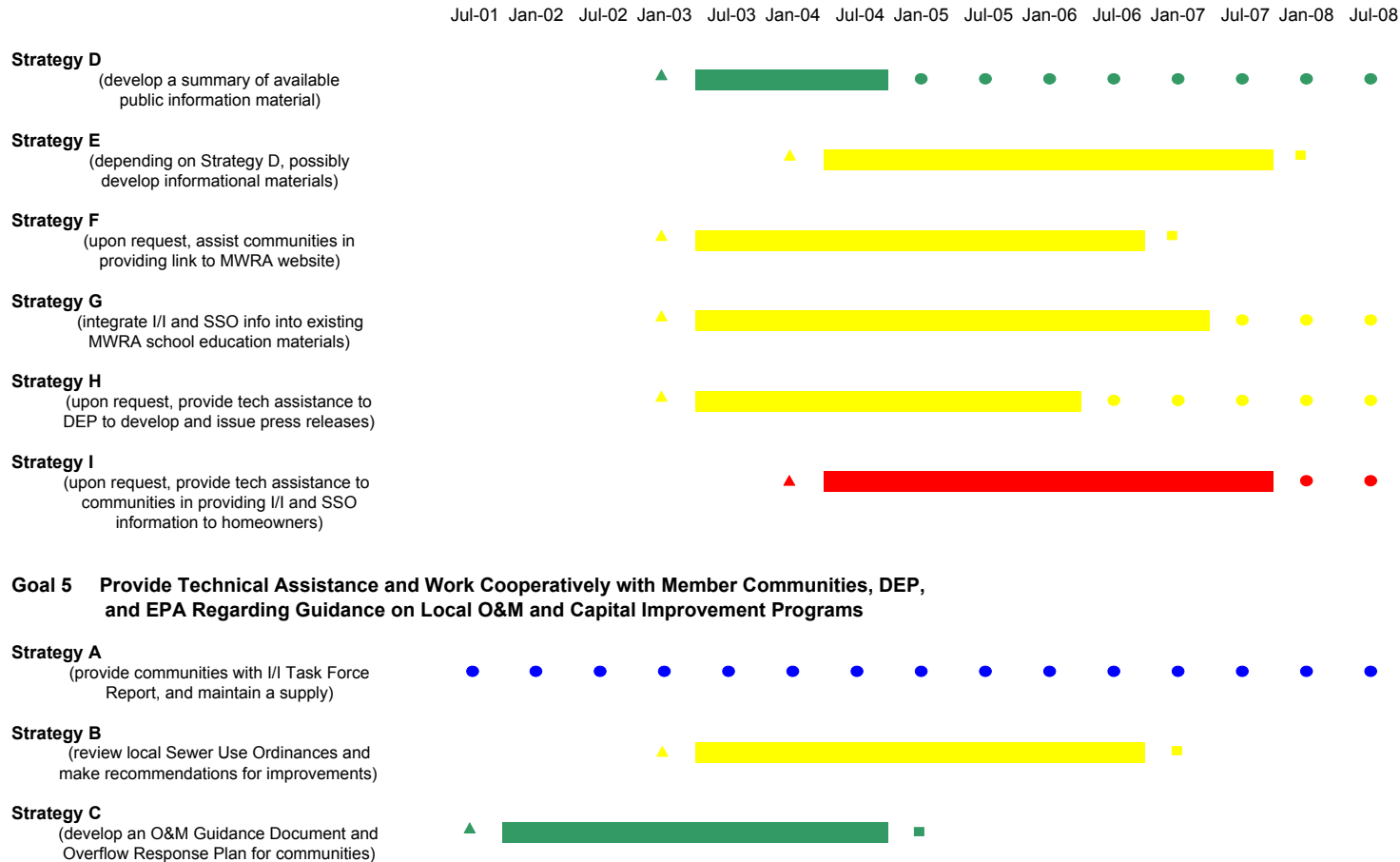
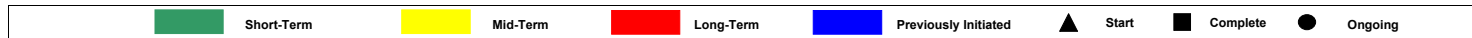


Strategy C
(together with DEP, organize periodic demonstrations and/or workshops)



Implementation Schedule for MWRA Regional I/I Reduction Plan

This detailed implementation schedule assumes EPA and MA DEP approve the MWRA Regional I/I Reduction Plan on or about January 2003



ATTACHMENT 3
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY03
Reporting Period – July 2002 Through June 2003

**MWRA REGIONAL I/I REDUCTION PLAN -
FY03 PROGRESS UPDATE AND DETAILED
IMPLEMENTATION SCHEDULE FOR FY04 ACTIVITIES**

This document provides a progress update for FY03 accomplishments and a description of the activities to be accomplished during FY04 for each of the I/I reduction strategies proposed in the MWRA I/I Reduction Plan. The update appears in bold type directly below each I/I reduction strategy. This document can be cross-referenced to the graphic implementation schedule attached to the MWRA Regional I/I Reduction Plan. 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 three fully outfitted internal TV inspection vehicles equipped with 6000 feet of multi-conductor cable. MWRA also utilizes an OZ-camera that has a 200X zoom capability. Annual inspection schedules are outlined in MWRA's Collection System O&M Manual. This strategy has an ongoing schedule that has been initiated.

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

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

During FY03, MWRA properly operated and maintained the MWRA-owned interceptor system. Specific activities undertaken by MWRA are detailed in Attachment 4. MWRA's new sonar camera was used extensively to evaluate many inverted sewer siphons without the need for shutdown and bypass pumping. Follow-up maintenance/cleaning was then scheduled on an as-needed basis. Additional information on MWRA's FY03 maintenance activities is provided under separate submittal - NPDES Part I.18.g Annual Maintenance Status Sheets.

During FY04, MWRA will continue to properly operate and maintain the MWRA-owned interceptor system including review of operational targets for the specific activities noted in Strategies A, B, and C, above.

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)

During FY03, MWRA efforts under this strategy were placed on hold awaiting DEP action. During spring 2001 MWRA provided DEP 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 DEP. A follow-up letter dated June 20, 2001 requested DEP identify the format for finalizing the SSO reporting/record keeping electronic database. DEP, in conjunction with staff in the Massachusetts Information Technology Division, are developing a new format SSO electronic database package. This project is part of statewide efforts to upgrade computerized resources and electronic access.

During FY04, this project may be substantially completed and may be rolled-out at part of the planned November 2003 DEP/MWRA joint workshop.

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)

During FY03, no progress was made on this strategy due to DEP's not completing its portion of work as described in Strategy A, above.

During FY04, MWRA will begin this strategy looking at existing MWRA SSO sites in MWRA's south collection system. The specific SSO sites will include those listed in the MWRA's Collection System Operation and Maintenance Manual.

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)

During FY03, most MWRA efforts under this strategy were be on hold awaiting DEP's development of the central information database. As an interim measure, MWRA requested and received from DEP community SSO records from 1996 through 2001. MWRA began compiling this historic information into a spreadsheet format that can be used to sort the data.

During FY04, MWRA will complete the data entry of historic SSO data and will evaluate what efforts can be made during the remainder of FY04 under this strategy.

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)

During FY03, no progress was made on this strategy.

During FY04, MWRA will begin this strategy looking at existing SSO sites in MWRA's south collection system. The specific SSO sites will include those listed in the MWRA's Collection System Operation and Maintenance Manual.

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)

During FY03, MWRA continued ongoing planning/design/construction on a variety of relief sewer and sewer rehabilitation projects that will reduce existing SSOs. Progress on these projects is detailed in Attachment 4.

During FY04 (in conjunction with the implementation of Strategy D, above), MWRA will begin evaluating the existing SSO sites in MWRA's south collection system. The specific SSO sites will include those listed in the MWRA's Collection System Operation and Maintenance Manual. The detailed hydraulic analyses performed for each existing capital project will be used in the summary report on the potential to eliminate each overflow.

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)

This strategy will be performed in conjunction with MWRA's Wastewater Hydraulic Optimization study. Under this study, an "Extreme Event Management Plan" will be developed. Some of the work under this Strategy should overlap/complement efforts under the Optimization study.

During FY03, MWRA continued progress on the Wastewater Hydraulic Optimization Study, a consultant contract being performed by Metcalf & Eddy. A significant portion of the work under this project during FY03 was the development of alternatives for the Extreme Event Management Plan. The goal of this portion of the project is to develop and evaluate relief and/or diversion alternatives and operational strategies under an extreme storm event. In June 2003, the consultant held a workshop with MWRA field operations and engineering staff to develop alternatives and review preliminary hydraulic modeling analyses.

During FY04, the Wastewater Hydraulic Optimization Study – Extreme Event Management Plan should be finalized. When complete, a copy of the technical memorandum will be provided to DEP. MWRA will then looking at existing SSO sites in MWRA's south collection system. The specific SSO sites will include those listed in the MWRA's Collection System Operation and Maintenance Manual.

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 under this strategy is intended to follow-up on discussions with local plumbing inspectors who attended the November 2001 joint DEP/MWRA workshop on Private Inflow Removal. During FY03, no progress was made on this strategy.

During FY04, MWRA will send an informational letter to all service area community plumbing inspectors and Health Departments (Boards of Health). The timing of distribution of the letter will be coordinated with DEP rollout of the updated collection system OM&R guidelines and the electronic SSO reporting form. Timing will also be coordinated with the planned November 2003 DEP/MWRA workshop on collection system OM&R.

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

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

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

During FY03, MWRA continued to estimate community infiltration and inflow rates on a bimonthly basis. Community wastewater flow data for CY02 is included as Attachment 7. The wastewater flow data tables included as Attachment 7 were distributed to member communities on July 15, 2003. Community wastewater flow rate basis data is distributed to member communities throughout the year on a bimonthly basis.

During FY04, 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 DEP 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)

During FY03, MWRA completed the request for proposals phase of the Wastewater Meter Replacement project.

During FY04, MWRA will select the contractor and begin the Wastewater Meter Replacement project. Construction of this project will run through FY05. No action under this Strategy will commence during FY04/FY05. This Strategy will be initiated in FY06, following completion of the Wastewater Meter Replacement project.

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

During FY03, no progress was made on this Strategy. This Strategy will be initiated in FY04/FY05.

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)

During FY03, MWRA began preparation of GIS mapping information that identifies water resource areas and provides an overlay of local and regional sewers.

During FY04, MWRA will continue work on this strategy by beginning to coordinate with community staff on review of the mapping information. Technical assistance to

communities within the Boston Harbor Basin (Neponset and Weymouth/Weir River Watersheds) and Ipswich Basin (Ipswich River Watershed) will be prioritized.

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)

During FY03, MWRA continue to provide grants and loans to member sewer communities to fund local I/I reduction and sewer system rehabilitation projects. A total of \$16.2 million was distributed during FY03. Since inception of the program in May 1993, over \$93 million has been distributed to fund local projects. A detailed status update on MWRA’s I/I Local Financial Assistance program is included as Attachment 5.

During FY04, MWRA will continue to fund the I/I Local Financial Assistance Program.

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

During FY03, MWRA continued to provide emergency assistance to member communities, as requested. These efforts included internal TV inspection of 4 miles of local sewers.

During FY04, 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)

In July 2003, MWRA distributed technical information to wastewater system operators, including:

- 1. MWRA Regional Infiltration/Inflow Reduction Plan, September 2002.**
- 2. Generic Standards for Design and Construction of Building Sewers. These standards for service connections were adapted from the Town of Stoughton Standards as enacted by the Town in March 2003.**
- 3. AMSA Weather Survey Final Report, dated May 2003.**
- 4. Two versions of the Water Environment Federation (WEF) publication "Fat Free Sewers" and information for purchase.**

During FY04, MWRA will continue to coordinate with EPA and MADEP to identify information on I/I and SSO issues to be distributed within the region.

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)

During FY03, MWRA began development of the summary of previous information/technology distributions regarding I/I reduction and SSOs.

During FY04, MWRA will provide EPA and MADEP a draft copy of the information summary so that the agencies can provide input prior to distribution to regional stakeholders.

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)

The first joint DEP/MWRA workshop – “Private Inflow Removal” - was held during November 2001. In November 2002, the second joint DEP/MWRA workshop – “Managing Wastewater Flows and Capacity” was held.

During FY04, MWRA will continue to work cooperatively with DEP on this strategy. A joint workshop on sewer system OM&R is being planned for November 2003.

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)

During FY03, MWRA began compiling available materials. MWRA distributed the Fat-Free Sewers brochure to wastewater system operators in July 2003.

During FY04, MWRA will continue work on this strategy. MWRA will provide EPA and MADEP a draft copy of the information summary so the agencies can provide input prior to distribution to regional stakeholders.

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)

During FY03, no progress was made on this Strategy.

During FY04, this Strategy will be initiated.

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)

During FY03, MWRA compiled a list of all member community web sites and began compiling a list of web sites from other appropriate agencies.

During FY04, MWRA will continue work on this strategy. An informational letter will be distributed to all member communities.

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)

During FY03, no progress was made on this Strategy.

During FY04, MWRA Community Support Program staff will coordinate with MWRA School Education Program staff to discuss what actions may be appropriate under this strategy.

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

During FY03, no assistance from MWRA was requested by MADEP.

During FY04, any action under this strategy will be initiated jointly with MADEP.

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

During FY03, no progress was made on this Strategy.

During FY04, this Strategy will be initiated.

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.

MWRA provide 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 will continue to maintain a supply of I/I Task Force Reports and will provide 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.

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)

During FY03, all member communities were requested to provide a copy of their existing local Sewer Use Regulations to MWRA. MWRA began review of the local Sewer Use Regulations and began development of a table format for comparison of the local regulations. Based on the outcome of the review, a format for developing recommendations for improvements will be determined. In July 2003, all member communities were provided a copy of a generic standard for design and construction of

building sewers. Some communities requested electronic copies of the standard and expressed interest in incorporating the standard into their existing local regulations.

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.

MWRA initiated work on this strategy during FY01. A Member Community Collection System Operation and Maintenance Manual Guidance Document and Overflow Response Plan was developed and submitted to EPA and MADEP for review in June 2001. This guidance document has been made available to member communities. During FY03, efforts under this strategy were on hold awaiting (1) EPA and/or MADEP review comments, (2) issuance of the MADEP Updated Operation, Maintenance and Replacement Guidelines, and (3) issuance of the EPA SSO Rules, including CMOM Regulations.

ATTACHMENT 4
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY03
Reporting Period – July 2002 Through June 2003

MWRA ACTIONS TAKEN TO REDUCE I/I DURING FY03

The MWRA Field Operations Department's Technical Inspection program staff have internally inspected approximately 45 miles of Authority-owned interceptors and approximately 4 miles of community-owned sewers, and physically inspected about 800 sewer manholes and other structures (diversion chambers, siphon headhouses, etc.) during the past twelve months. During the internal inspection process, problems such as physical defects, infiltration, sediment, grease deposits, etc. are noted and stored in MWRA's electronic maintenance database. Problems identified during TV inspection of pipelines and physical inspection of manholes are referred to engineering staff for follow-up review. Significant physical defects and infiltration/inflow sources found through pipeline and manhole inspections are reviewed for cost-effective repair. Also during FY03, 1450 manholes were located using MWRA's global positioning system (GPS) equipment. This information has been added to the collection system electronic database.

The MWRA is undertaking a number of projects to rehabilitate portions of Authority-owned interceptors. Updates on these projects are included below.

1. Contract 5 to MWRA's Framingham Extension Relief Sewer Project (\$13 million) was completed in FY03. The project included rehabilitation of about 3 miles of 42 and 48-inch concrete pipe on the Framingham Extension Sewer (FES) in Natick and Dover. This work reduced infiltration entering the FES system and will minimize future sewer corrosion.
2. MWRA's South Charles River Valley Sewer rehabilitation project was completed in FY03. Over 5,000 feet of 54 x 61.5-inch brick sewer was rehabilitated using a cured-in-place pipe liner.
3. MWRA's \$30 million Chelsea Branch Sewer and Revere Extension Sewer Rehabilitation Project provided for the rehabilitation of approximately 10,000 feet of 30 to 54-inch interceptor serving Everett, Chelsea and Revere. This project is substantially complete.
4. The initial stage of the West Roxbury Tunnel rehabilitation has been substantially completed. This portion involved sliplining of approximately 1000 feet of 84-inch pipe (Sewer Section 138) and rebuilding of the west portal chamber (beginning of Sewer Section 137). Construction of this \$10 million project began in June 2001. The second phase of this project is design and construction to rehabilitate approximately 12,000 linear feet of the 84-inch West Roxbury Tunnel (Sewer Section 137). This \$75 million project is scheduled for FY04 through FY12.

5. MWRA's \$218 million Braintree/Weymouth Relief Facilities Project includes rehabilitation of approximately 2000 feet of 60 x 57-inch interceptor within Section 124 in Weymouth. This portion of sewer is severely deteriorated and contributes significant infiltration. This \$11 million project is scheduled for FY04 through FY06.
6. Under MWRA's Interceptor Asset Protection Program, three rehabilitation projects are currently planned. The \$1.3 million Mill Brook Relief Sewer (Section 93A) Project is scheduled for FY04/05 and includes rehabilitation of approximately 4,000 feet of sewer. The \$2 million evaluation/rehabilitation of Section 80/83 is scheduled for FY06/07. The \$4 million Mystic Valley Sewer (Section 160) evaluation/rehabilitation Project is scheduled for FY06/08. Each of these projects will reduce I/I entering the interceptor system.
7. MWRA's \$27 million Upper Neponset Valley Sewer Project is intended to provide hydraulic relief to about four miles of Sewer Sections 526, 527, 528, 529, and 530 located in Newton and West Roxbury. These sewers, constructed in 1896 to 1902, receive flow from West Roxbury, Newton, Brookline and Dedham. As an outcome of this project, I/I and periodic sewer system overflows will be reduced. This project is in the design stage.
8. MWRA's \$6 million Cummingsville Replacement Sewer Project is intended to provide hydraulic relief through replacement of about one mile of Sewer Section 47 (constructed in the 1890's) and rehabilitation of about one mile of Sewer Section 86 (constructed in 1952) in Winchester. As an outcome of this project, I/I and periodic sewer system overflows will be reduced. This project is scheduled for FY05 through FY08.
9. MWRA's \$60 million East Boston Branch Sewer Relief Project will provide for the replacement or rehabilitation of approximately 25,000 feet of existing sewer in East Boston. Construction is scheduled for FY05/07.
10. MWRA's 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.

ATTACHMENT 5
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY03
Reporting Period – July 2002 Through June 2003

**STATUS UPDATE ON MWRA's
I/I LOCAL FINANCIAL ASSISTANCE PROGRAM**

Financial Assistance Update

All 43-member sewer communities are participating in MWRA's \$140.75 million Infiltration/Inflow (I/I) Local Financial Assistance (grant/loan) Program. The program began in May 1993 and, through FY03, over \$93 million has been distributed to fund local I/I reduction and sewer system rehabilitation projects. The table on page 2 provides a summary of funds allocated, distributed, and remaining for each member community. Distribution of the remaining \$47 million in funds has been approved through FY10.

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 Advisory Board, the Board of Directors approved a total program budget of \$140.75 million. The funds have been allocated among the 43 MWRA sewer communities based on respective shares of overall MWRA wholesale sewer charges. 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 and 4 funds (total of \$77 million) to a 45 percent grant and a 55 percent interest-free loan. The loan portion is repaid to MWRA over a five-year period beginning one year after the date the funds are distributed.

MWRA funding is provided to a community following execution of a standard agreement that stipulates the project scope, schedule, and loan repayment requirements. Each community is 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, staff perform site visits to document progress.

Program Goals

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

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM
FUNDING SUMMARY**

29-Aug-03

Community	Total Allocations (Phases 1/2/3/4)	Total Distributions (Phases 1/2/3/4)	Percent Distributed	Funds Remaining
Arlington	\$2,701,000	\$1,277,200	47%	\$1,423,800
Ashland	\$550,500	\$550,500	100%	\$0
Bedford	\$1,079,600	\$549,300	51%	\$530,300
Belmont	\$1,664,100	\$1,167,400	70%	\$496,700
Boston	\$40,170,200	\$21,973,426	55%	\$18,196,774
Braintree	\$2,373,000	\$1,983,127	84%	\$389,873
Brookline	\$3,980,200	\$3,980,200	100%	\$0
Burlington	\$1,517,800	\$622,840	41%	\$894,960
Cambridge	\$7,315,100	\$4,919,855	67%	\$2,395,245
Canton	\$1,281,900	\$1,281,900	100%	\$0
Chelsea	\$1,901,100	\$1,609,264	85%	\$291,836
Dedham	\$1,833,000	\$1,833,000	100%	\$0
Everett	\$2,425,500	\$2,425,500	100%	\$0
Framingham	\$3,943,000	\$1,582,395	40%	\$2,360,605
Hingham	\$445,500	\$445,500	100%	\$0
Holbrook	\$496,600	\$496,600	100%	\$0
Lexington	\$2,175,300	\$1,533,600	71%	\$641,700
Malden	\$3,529,900	\$1,988,997	56%	\$1,540,903
Medford	\$3,726,600	\$2,656,500	71%	\$1,070,100
Melrose	\$1,769,300	\$579,800	33%	\$1,189,500
Milton	\$1,779,500	\$1,779,500	100%	\$0
Natick	\$1,782,600	\$1,157,000	65%	\$625,600
Needham	\$2,038,600	\$1,478,300	73%	\$560,300
Newton	\$6,517,400	\$4,545,700	70%	\$1,971,700
Norwood	\$2,091,400	\$1,744,600	83%	\$346,800
Quincy	\$5,985,000	\$5,872,000	98%	\$113,000
Randolph	\$1,850,800	\$1,330,900	72%	\$519,900
Reading	\$1,356,100	\$975,400	72%	\$380,700
Revere	\$2,902,900	\$1,331,500	46%	\$1,571,400
Somerville	\$4,823,800	\$889,700	18%	\$3,934,100
Stoneham	\$1,635,900	\$1,635,900	100%	\$0
Stoughton	\$1,436,900	\$1,436,900	100%	\$0
Wakefield	\$1,824,900	\$1,496,600	82%	\$328,300
Walpole	\$1,139,000	\$1,139,000	100%	\$0
Waltham	\$4,212,400	\$4,212,400	100%	\$0
Watertown	\$2,041,800	\$322,565	16%	\$1,719,235
Wellesley	\$1,751,700	\$455,940	26%	\$1,295,760
Westwood	\$733,300	\$733,300	100%	\$0
Weymouth	\$3,517,900	\$3,206,941	91%	\$310,959
Wilmington	\$740,000	\$740,000	100%	\$0
Winchester	\$1,324,000	\$952,300	72%	\$371,700
Winthrop	\$1,062,400	\$287,100	27%	\$775,300
Woburn	\$3,322,500	\$2,370,200	71%	\$952,300
Totals	\$140,750,000	\$93,550,650	66%	\$47,199,350

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. Sixty-nine percent of the funds distributed to date have financed the actual local construction projects themselves. 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:	\$ 10.9	\$ 6.7	\$ 17.6 (19%)
Design:	2.9	1.4	4.3 (4%)
Construction:	49.7	16.5	66.2 (71%)
Eng. Services During Const.:	4.1	1.3	5.4 (6%)
TOTAL	\$ 67.6 (72%)	\$ 25.9 (28%)	\$ 93.5 (100%)

Projects Funded During FY03

Local projects are funded quarterly by MWRA. Available upon request are funding summaries for the four quarterly funding distributions during FY03: August/September 2002, November 2002, February 2003, and May 2003. Each funding summary includes the scope of services and project schedule for the funded projects.

ATTACHMENT 6
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY03
Reporting Period – July 2002 Through June 2003

**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 \$140.75 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 FY03, MWRA has distributed over \$93 million to fund local projects. A detailed update on this program is included as Attachment 5.

The Authority has instituted a computer-based questionnaire format for communities to comply with required annual I/I reduction program status reporting. All 43 member sewer communities have submitted the latest I/I status report; the information is summarized in the following paragraphs.

1. ARLINGTON: North System

Background Information:

- Miles of Sewer: 104 Sewered
- Population: 42,347
- Three Year ('99-'01) Annual Average I/I: 2.96 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Grove/Brattle St. Area I/I Reduction Study

Private Source Inflow Removal Program: East End Sewer Study metering identified areas that will require additional study to identify possible sump pump/drain leader connections to the sewer.

I/I Rehabilitation Projects in Design or Construction: Main line inspections performed in utility construction and roadway rehabilitation areas. Ongoing service line CCTV inspections in suspected problem areas.

Reporting Period Activity: Replaced approximately 250 feet of 12-inch sewer on Grove Street Place and Brattle Court. Construction ongoing for the replacement of 700 feet of 8-inch sewer on Indian Hill Road.

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 \$2,701,000 allotted through the Program's Phases 1-4, the community has \$1,423,800 remaining in funding assistance. The community also used the MMDT accrued interest (approximately \$75,000) to partially fund the Summer Street sewer rehabilitation project.

2. ASHLAND: South System

Background Information:

- Miles of Sewer: 42 Sewered
- Population: 9,685
- Three Year ('99-'01) Annual Average I/I: 0.39 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Investigation and Repair 2001 (Sub-Basins I & II)

Private Source Inflow Removal Program: The town will be performing I/I removal from homes and businesses in Sub-Basin II this calendar year.

I/I Rehabilitation Projects in Design or Construction: Both the Douglas Road and Metcalf Avenue sewer rehabilitation projects have been completed with an estimated I/I removal of 60,000 gallons. Completed rehabilitation of 1,560 linear feet of 18-inch sewer and a siphon replacement in Framingham.

Reporting Period Activity: The Town has a sewer moratorium on new sewer connections at this time. New connections are only added if I/I removal has been achieved.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$550,500 of funding assistance.

3. BEDFORD: North System

Background Information:

- Miles of Sewer: 68
- Sewered Population: 11,084
- Three Year ('99-'01) Annual Average I/I: 1.67 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Study, May 2000

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

I/I Rehabilitation Projects in Design or Construction: Sanitary Sewer Investigation and Rehabilitation for sewers in Harvard Drive, Evergreen Avenue and Wiggins Avenue are ongoing. To date, thirteen sewer manholes have been rehabilitated with an estimated I/I removal of 10,750 gpd.

Reporting Period Activity: Removal of an estimated 14,400 gpd of peak infiltration at a manhole located on Norma Road. Removal of an estimated 170,000 gpd of peak inflow by plugging a drainage pipe which had been flowing into the sanitary sewer.

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 \$1,079,600 allotted through the Program's Phases 1-4, the community has \$530,300 remaining in funding assistance.

4. BELMONT: North System

Background Information:

- Miles of Sewer: 77
- Sewered Population: 23,686
- Three Year ('99-'01) Annual Average I/I: 2.42 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: SSES, Phase II Final, April 1988

Private Source Inflow Removal Program: FS&T is performing home inspections on over 300 properties to determine the extent of sump pump connections to the Town's sanitary sewer system.

I/I Rehabilitation Projects in Design or Construction: FS&T has completed final design plans for connecting private inflow sources to the town's storm drain system. Awarding of a construction contract should occur this fall. This project will remove approximately 1,165,000 gpd of peak daily inflow from the existing sewer.

Reporting Period Activity: The town has developed, and is working to implement, a program where developers would either remove I/I at a rate of 5:1 or make a one time payment to the town to fund I/I removal work by the town. The three developers at the McLean Hospital site have formally agreed to participate in this program. The developer of the Belmont Uplands has also agreed to the 5:1 I/I removal rate.

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 \$1,664,100 allotted through the Program's Phases 1-4, the community has \$496,700 remaining in funding assistance.

5. BOSTON: North and South Systems

Background Information:

- Miles of Sewer: 858
- Sewered Population: 562,370
- Three Year ('99-'01) Annual Average I/I: 41.0 mgd
- Massachusetts DEP Administrative Order: None (Cooperative agreement exists)

Latest I/I or SSES Report: Ward Street Headworks SSES, February 2000

Private Source Inflow Removal Program: In late 2002, the Commission began an intensive Downspout Disconnection Program. This program will disconnect approximately 20,500 downspouts over the next four years.

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 rehabilitation projects. To date, forty-two (42)

projects have received funding through the MWRA I/I Local Financial Assistance Program. BWSC is currently conducting a Downspout Disconnection Program. In CY02/03, 2,000 downspouts on 962 buildings were disconnected in Dorchester, West Roxbury, and Roslindale.

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.

Boston is one of MWRA's four combined sewer service communities. As part of the MWRA CSO Facilities Upgrade Project, Boston's flows are being evaluated for volume and discharge locations.

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 over this period.

MWRA I/I Local Financial Assistance Program: The community has financed forty-two (42) I/I reduction projects through the Authority's funding assistance program. Of the \$40,170,200 allotted through the Program's Phases 1-4, the community has \$17,680,474 remaining in funding assistance.

6. BRAINTREE: South System

Background Information:

- Miles of Sewer: 134
- Sewered Population: 33,794
- Three Year ('99-'01) Annual Average I/I: 4.32 mgd
- Massachusetts DEP Administrative Order: No. 546, issued on March 27, 2001.

Latest I/I or SSES Report: Flow Isolation and TV Inspection of the Allen St. Interceptor, April 2003.

Private Source Inflow Removal Program: Two Private Sump Pump Redirect projects that redirected 47 sump pumps. Developer Flow Reduction is now 6:1 per DEP ACO.

I/I Rehabilitation Projects in Design or Construction: Infiltration work on 41 house connections identified from MWRA TV inspection work is complete. The Allen Street interceptor lining and infiltration work in sub-areas HC-2 and M-2 is complete.

Reporting Period Activity: Contract 2001-S2, completed May 2003. The project had an estimated I/I removal of 39,636 gpd.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$2,373,000 allotted through the Program's Phases 1-4, the community has \$389,873 remaining in funding assistance.

7. BROOKLINE: North and South Systems

Background Information:

- Miles of Sewer: 103
- Sewered Population: 56,536
- Three Year ('99-'01) Annual Average I/I: 6.20 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Wastewater System Master Plan, November 1999

Private Source Inflow Removal Program: No additional inspections were reported during this period. The Town is reviewing the scope of work from consultant for Private flow Source Identification and Removal Program.

I/I Rehabilitation Projects in Design or Construction: Sewer Rehabilitation Project No. 3 including various locations townwide has lined 2100 L.F. of sewer. The project has removed approximately 23,000 gpd of Infiltration.

Reporting Period Activity: I/I Reduction Project No. 1 including the investigation and rehabilitation of Sub-area NI-1 and NI-2 is ongoing. The Town completed (Sewer Separation Project No. 3) installing 3,200 feet of sewer including Emerson Street, Davis Street, Elm Street and Washington Street. The project removed approximately 70,000 gpd of I/I.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$3,980,200 of funding assistance.

8. BURLINGTON: North System

Background Information:

- Miles of Sewer: 115
- Sewered Population: 21,995
- Three Year ('99-'01) Annual Average I/I: 1.98 mgd
- Massachusetts DEP Administrative Order: No. 618, issued (as revised) on May 12, 1986 and updated in 2001.

Latest I/I or SSES Report: Sewer System Evaluation Survey, January 2003

Private Source Inflow Removal Program: 268 house-to-house inspections have been conducted. 18 sump pump have been identified. 4 sump pumps have been redirected

I/I Rehabilitation Projects in Design or Construction: Developer flow reduction has removed 580,000 gpd of inflow from the system..

Reporting Period Activity: Two sump pumps have been redirected and inflow has been removed based on Metcalf & Eddy's preliminary report. I/I study is approaching completion.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$1,517,800 allotted through the Program's Phases 1-4, the community has \$894,960 remaining in funding assistance.

9. CAMBRIDGE: North System

Background Information:

- Miles of Sewer: 163
- Sewered Population: 101,254
- Three Year ('99-'01) Annual Average I/I: 9.45 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Phase II Analysis/Fast Track Design of I/I Rehab. Projects, March 2003

Private Source Inflow Removal Program: Fawcett Street area building inspections complete. May Street area building inspections to begin August 2002.

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

Reporting Period Activity: Common Manhole Contract No. 3 will be advertised for bid in the Fall 2003. Phase VI - Contract 2B and 3B sewerage and drainage improvements, are complete. South Massachusetts Avenue sewerage and drainage improvements, complete. Design and permitting are ongoing for the Willard Street Outfall and Beacon Street Flood Alleviation projects. Design complete for the Cambridgeport and Myrtle/Magnolia improvements projects. South Massachusetts Avenue Sanitary Sewer Rehabilitation is in the design and permit stage.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$7,315,100 allotted through the Program's Phases 1-4, the community has \$2,395,245 remaining in funding assistance.

10. CANTON: South System

Background Information:

- Miles of Sewer: 63
- Sewered Population: 16,620
- Three Year ('99-'01) Annual Average I/I: 2.07 mgd
- Massachusetts DEP Administrative Order: No. 537 Issued on April 3, 1984.

Latest I/I or SSES Report: Comprehensive Water Resources Management Plan

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

I/I Rehabilitation Projects in Design or Construction: The Additional Investigations Project based on the 1994 SSES is progressing. Design work for the replacement of Green Lodge Interceptor is in the initial stages.

Reporting Period Activity: Trayer Road Pump Station completed and on-line.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$1,281,900 of funding assistance.

11. CHELSEA: North System

Background Information:

- Miles of Sewer: 41
- Sewered Population: 35,080
- Three Year ('99-'01) Annual Average I/I: 2.0 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Inflow Evaluation for the area tributary to CSO CHE-007, March 2003

Private Source Inflow Removal Program: Private inflow source identification is complete for CHE-007 tributary areas.

I/I Rehabilitation Projects in Design or Construction: Sewer replacement on Chestnut Street includes approximately 1,200 feet of 8 and 12-inch sewers. Construction ongoing with estimated completion in Fall 2003. I/I rehabilitation and sewer separation in the tributary to CSO CHE-008 is ongoing. Sewer Separation on Vila Street and Dudley Street planned for Fall 2003.

Chelsea is one of MWRA's combined sewer service communities. As part of the MWRA CSO Facilities Upgrade Project, Chelsea's flows are being evaluated for volume and discharge locations.

Reporting Period Activity: Construction of Crescent Avenue Sewer Project is complete. Construction is complete for the rehabilitation of the Carter Street drainage Pump Station. Construction ongoing for Sewer and Drain Improvements on Parker Street and Lafayette Avenue. Rehabilitation of the Lash Street Sewer completed Fall 2002.

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 \$1,901,100 allotted through the Program's Phases 1-4, the community has \$291,836 remaining in funding assistance.

12. DEDHAM: South System

Background Information:

- Miles of Sewer: 82
- Sewered Population: 22,056
- Three Year ('99-'01) Annual Average I/I: 3.67 mgd
- Massachusetts DEP Administrative Order: No. 547 Issued on October 1, 1985.

Latest I/I or SSES Report: Glenway/Hamilton Avenue Study Area(draft report), May 2003.

Private Source Inflow Removal Program: The review of the past inspection work in the Glenway/Hamilton avenue area was performed. Rehabilitation recommendations needed to reduce inflow and infiltration will be incorporated into roadway improvement project scheduled for the Spring 2004.

I/I Rehabilitation Projects in Design or Construction: The Town is currently conducting a roadway improvement/drainage along East Street from the Endicott Street rotary to High Street. A preliminary design report has been prepared. The design of the 1,100 feet of sewer replacement and extension on Wentworth Street and the Endicott Estate has been incorporated into the Glenway/Hamilton Avenue design. The Town completed the design of a replacement sewer on Nelson Drive.

Reporting Period Activity: The Town recently completed the inspection of three sewer subareas, totaling approximately 40,000 feet of sewer. Construction of new sanitary sewers on Dunn Terrace and Galvin Place 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. The community has spent its entire \$1,833,000 of funding assistance.

13. EVERETT: North System

Background Information:

- Miles of Sewer: 52
- Sewered Population: 37,999
- Three Year ('99-'01) Annual Average I/I: 3.67 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Investigation, February 2000

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

I/I Rehabilitation Projects in Design or Construction: The City is in the process of designing a construction contract based upon smoke testing and TV inspection performed during Fall 1999.

Reporting Period Activity: The town continues with their sewer system separation and rehabilitation. The separation work consists of the redirection of six catch basins from the sewer system to the drainage system on Hamilton Street, Hoyt Street, Perry Place and Silver Street. The sewer rehabilitation work will consist of the replacement of complete sewer segments and small spot repairs in Sewer Area 3.

MWRA I/I Local Financial Assistance Program: The community has financed six (6) I/I reduction projects through the Authority's funding assistance program. The community has spent the entire \$2,425,500 of funding assistance.

14. FRAMINGHAM: South System

Background Information:

- Miles of Sewer: 275
- Sewered Population: 62,226
- Three Year ('99-'01) Annual Average I/I: 2.81 mgd
- Massachusetts DEP Administrative Order: No. 592 Issued on January 8, 1986.

Latest I/I or SSES Report: Town-Wide I/I Study, ongoing.

Private Source Inflow Removal Program: Sewer use regulations are being updated to strengthen penalties levied to private source inflow. The Town is undertaking a Storm Water Management Study that will provide mapping of the town-wide storm water drainage system.

I/I Rehabilitation Projects in Design or Construction: The Sudbury River Interceptor Rehabilitation project is ongoing. Approximately 100 manholes and 6,500 feet of sewers rehabilitated. The Town approved \$300,000 for FY04 for further I&I reduction efforts.

Reporting Period Activity: The Town's Developer Flow Reduction program has removed 16,628 gpd in town and 36,080 gpd out of town.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$3,943,000 allotted through the Program's Phases 1-4, the community has \$2,360,605 remaining in funding assistance.

15. HINGHAM: South System

Background Information:

- Miles of Sewer: 31
- Sewered Population: 6,124
- Three Year ('99-'01) Annual Average I/I: 0.79 mgd
- Massachusetts DEP Administrative Order: No. 536 Issued on November 15, 1985.

Latest I/I or SSES Report: TV Inspection, October 1987.

Private Source Inflow Removal Program: The door-to-door sump pump inspection program continues; since last report 30 houses on 16 streets have been inspected. Based on these inspections, 6 illicit sump pumps were located and redirected including 2 roof leaders.

I/I Rehabilitation Projects in Design or Construction: The Town has allocated \$500,000 for sewer relining a portion of the North Street and adjacent chimney repair. Work is expected to be complete December 2003. An estimated I/I reduction of 161,000 gpd is expected. Approximately 75 new connections are expected to be added in the next year from the Baker Hill and Lincoln Hill developments. Brewer Beach sewer inspection complete.

Reporting Period Activity: The Town has collected \$141,874 from the Developer Flow Reduction Program. These funds will be used to conduct the sump pump program and for sewer renovations.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$445,500 of funding assistance.

16. HOLBROOK: South System

Background Information:

- Miles of Sewer: 36
- Sewered Population: 8,326
- Three Year ('99-'01) Annual Average I/I: 0.46 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Identification Plan, ongoing.

Private Source Inflow Removal Program: Public Works Supervisors inspected properties connected to the municipal system. New homes were inspected during the installation of water meters. Some commercial establishments were revisited to monitor possible inflow connections.

I/I Rehabilitation Projects in Design or Construction: Various areas of main trunk sewers were flushed during the year. The Town has approved an 8 lot subdivision.

Holbrook's collection system is relatively new (post 1976). The Town has proposed to hold off on a SSES until additional sewer contracts will have been constructed. The Holbrook collection system is being extended under the present Phase II Construction Project.

Reporting Period Activity: The Town has completed its yearly check of all cross-country sewer manholes.

MWRA I/I Local Financial Assistance Program: The community has financed one (1) I/I reduction project through the Authority's funding assistance program. The community has spent the entire \$496,600 of funding assistance.

17. LEXINGTON: North System

Background Information:

- Miles of Sewer: 153
- Sewered Population: 28,625
- Three Year ('99-'01) Annual Average I/I: 2.86 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Sewer System GPS Mapping, April 2002.

Private Source Inflow Removal Program: The Town is in the process of preparing a public education brochure.

I/I Rehabilitation Projects in Design or Construction: Sewer Lining Contract 03-12 (October 02, - May): cured in place lining of 2,500 L.F. of 21" vitrified clay sewer pipe and 1,500 L.F. of 12" vitrified clay sewer pipe, completed May 2003.

Reporting Period Activity: The Town issued 39 new sewer connection permits. Sewer extension for Johnson's Farm Subdivision is ongoing. Pine Meadows Golf Course sewer connection is ongoing.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$2,175,300 allotted through the Program's Phases 1-4, the community has \$641,700 remaining in funding assistance.

18. MALDEN: North System

Background Information:

- Miles of Sewer: 99
- Sewered Population: 56,284
- Three Year ('99-'01) Annual Average I/I: 5.37 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Analysis and SSES in Broadway II Sump Area, March 1996.

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

I/I Rehabilitation Projects in Design or Construction: Design is underway for sewer line improvements in the Edgeworth area based on recommendations from I/I studies done by FS&T.

Reporting Period Activity: Sewer extensions in the Mountain View and Lake Street Subdivisions totaled 4100 feet.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$3,529,900 allotted through the Program's Phases 1-4, the community has \$1,540,903 remaining in funding assistance.

19. MEDFORD: North System

Background Information:

- Miles of Sewer: 114
- Sewered Population: 55,709
- Three Year ('99-'01) Annual Average I/I: 4.81 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Analysis / Limited SSES – Part 2, October 2002

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

I/I Rehabilitation Projects in Design or Construction: There have been no modifications or extensions to the collection system over the last 6 months.

Reporting Period Activity: Fellsway East Sewer Relining Project is ongoing.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$3,726,600 allotted through the Program's Phases 1-4, the community has \$1,070,100 remaining in funding assistance.

20. MELROSE: North System

Background Information:

- Miles of Sewer: 74
- Sewered Population: 27,107
- Three Year ('99-'01) Annual Average I/I: 2.12 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Rehabilitation Project Recommendations, November 28, 2001

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

I/I Rehabilitation Projects in Design or Construction: None.

Reporting Period Activity: The City is continuing its public and private inflow source identification and removal program. In the past year, the City has raised 2 MWRA and 2 community sewer manholes at the Roosevelt School to elevations above flood stage to eliminate stormwater inflow. The City issued a special permit to a large mixed-use development with a special condition to remove 115,175 gpd of I/I.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$1,769,300 allotted through the Program's Phases 1-4, the community has \$1,189,500 remaining in funding assistance.

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

Background Information:

- Miles of Sewer: 83
- Sewered Population: 24,498
- Three Year ('99-'01) Annual Average I/I: 2.85 mgd
- Massachusetts DEP Administrative Order: No. 580, issued on June 13, 1985.

Latest I/I or SSES Report: I/I Rehabilitation – Year 1 Construction, September 2002.

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.

I/I Rehabilitation Projects in Design or Construction: In July 2003, bids were received for the I/I rehabilitation of pipeline defects identified during the Town-Wide Sewer Evaluation Program–Year 1. This project will remove an estimated 9,518 gpd from the sewer system. Construction is expected to begin in September 2003. Television and manhole inspections for Year 2 of the Town-Wide Sewer Evaluation Program were conducted in Spring 2003.

Reporting Period Activity: The Town has installed 2,500 L.F. of sewer on Woodland Road. The Developer for the Milton Landing Project at Wharf Street is conducting an area sewer study.

MWRA I/I Local Financial Assistance Program: The community has financed twelve (12) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$1,779,500 of funding assistance.

22. NATICK: South System

Background Information:

- Miles of Sewer: 105
- Sewered Population: 26,798
- Three Year ('99-'01) Annual Average I/I: 1.50 mgd
- Massachusetts DEP Administrative Order: No. 593, issued on November 15, 1985.

Latest I/I or SSES Report: I/I Study, 2002/2003

Private Source Inflow Removal Program: Home inspections conducted during water meter replacement. The Town is scheduled to replace all meters in the next three years.

I/I Rehabilitation Projects in Design or Construction: Insituform lined 11,200 L.F. of sewer main. The I/I removal is approximately 15,00 gpd.

Reporting Period Activity: Town-Wide I/I Study is ongoing. Sherman Street Sewer Replacement Project is complete. This project replaced 1,185 L.F. of 12" sewer. Lakeshore Road Sewer Extension is complete.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$1,782,600 allotted through the Program's Phases 1-4, the community has \$625,600 remaining in funding assistance.

23. NEEDHAM: South System

Background Information:

- Miles of Sewer: 123
- Sewered Population: 26,887
- Three Year ('99-'01) Annual Average I/I: 3.39 mgd
- Massachusetts DEP Administrative Order: No. 549, issued on November 21, 1984.

Latest I/I or SSES Report: Smoke Testing Report

Private Source Inflow Removal Program: The Town performed follow-up house-to-house inspections within Needham Sub-Area 19-1.

I/I Rehabilitation Projects in Design or Construction: The Mackintosh Avenue sewer and manhole rehabilitation project is complete.

Reporting Period Activity: Carol Road and Frank Street sewer system rehabilitation is complete. The Town has completed 3,800 feet of sewer extensions at Olin College.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$2,038,600 allotted through the Program's Phases 1-4, the community has \$560,300 remaining in funding assistance.

24. NEWTON: North and South Systems

Background Information:

- Miles of Sewer: 268
- Sewered Population: 82,152
- Three Year ('99-'01) Annual Average I/I: 9.80 mgd
- Massachusetts DEP Administrative Order: ACO-NE-00-1001

Latest I/I or SSES Report: Cheesecake/Laundry Brook Drainage Area Study

Private Source Inflow Removal Program: The City continues home inspections for illicit connections to the sanitary sewer collection system and is currently completing a Private Inflow Removal Program.

I/I Rehabilitation Projects in Design or Construction: The Quinobequin Road I/I Removal Project is complete. The project removed an estimated 100,000 gpd of I/I. The Longfellow/Jassett Street I/I Removal Project is complete. The project removed an estimated 32,000 gpd of I/I.

Reporting Period Activity: The City added 43 new sewer connections to the sanitary system.

MWRA I/I Local Financial Assistance Program: The community has financed thirteen (13) I/I reduction projects through the Authority's funding assistance program. Of the \$6,517,400 allotted through the Program's Phases 1-4, the community has \$1,971,700 remaining in funding assistance.

25. NORWOOD: South System

Background Information:

- Miles of Sewer: 88
- Sewered Population: 28,558
- Three Year ('99-'01) Annual Average I/I: 3.57 mgd
- Massachusetts DEP Administrative Order: No. 534, issued on July 25, 1983.

Latest I/I or SSES Report: Inflow Identification Program is ongoing.

Private Source Inflow Removal Program: An additional 888 buildings were inspected, 25 illegal sump pump connections were identified, and 8 illegal connections have been removed.

I/I Rehabilitation Projects in Design or Construction: The Hawes Brook Basin I/I Identification project is ongoing. The Meadowbrook Basin project to identify sewer system I/I, as well as sources of wastewater pollution in storm drains, is ongoing. The Town has repaired 650 feet of sewer within the basin.

Reporting Period Activity: The Norwood Commerce Center, Phase II Sewer System Improvements project is ongoing.

MWRA I/I Local Financial Assistance Program: The community has financed eight (8) I/I reduction projects through the Authority's funding assistance program. Of the \$2,091,400 allotted through the Program's Phases 1-4, the community has \$346,800 remaining in funding assistance.

26. QUINCY: South System

Background Information:

- Miles of Sewer: 221
- Sewered Population: 87,937
- Three Year ('99-'01) Annual Average I/I: 9.30 mgd
- Massachusetts DEP Administrative Order: No. 644, issued on October 22, 1986.

Latest I/I or SSES Report: Houghs Neck Collection System/Sea Street Interceptor Evaluation. (March 2002).

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

I/I Rehabilitation Projects in Design or Construction: The North Quincy Lateral Sewer Improvements started in July 2003. The North Quincy Sewer Interceptor Improvements (Phase II) Project has been completed.

Reporting Period Activity: Area 7 Sewer and Water Improvements Project and Quincy Shore Drive Sewer Improvement Project (Phase I) are ongoing.

MWRA I/I Local Financial Assistance Program: The community has financed six (6) I/I reduction projects through the Authority's funding assistance program. Of the \$5,985,000 allotted through the Program's Phases 1-4, the community has \$113,000 remaining in funding assistance.

27. RANDOLPH: South System

Background Information:

- Miles of Sewer: 110
- Sewered Population: 30,715
- Three Year ('99-'01) Annual Average I/I: 1.82 mgd
- Massachusetts DEP Administrative Order: No. 548, issued on July 29, 1985.

Latest I/I or SSES Report: Amelian Road SSES, January 2003.

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

I/I Rehabilitation Projects in Design or Construction: The Amelian Road SSES contract is ongoing. This project includes smoke testing and house-to-house inspections.

Reporting Period Activity: The Town is developing a sump pump removal plan/policy along with expanding their Developer Flow Reduction Plan.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$1,850,800 allotted through the Program's Phases 1-4, the community has \$519,900 remaining in funding assistance.

28. READING: North System

Background Information:

- Miles of Sewer: 96
- Sewered Population: 22,262
- Three Year ('99-'01) Annual Average I/I: 1.20 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Wastewater Collection System Facilities Planning Report (October 1996).

Private Source Inflow Removal Program: Completed Phase 1 of the house-to-house inspection program. The project inspected 837 buildings and found 26 sump pumps connected to the sewer. The Town has created a private inflow removal reimbursement program and has removed 1 sump pump from the sewer system.

I/I Rehabilitation Projects in Design or Construction: The Town tested and sealed joints on approximately 18,000 feet of sewer mains. Approximately 26,000 feet of sewers were cleaned and TV inspected. The sewer replacement project in the Walkers Brook Drive Area is complete.

Reporting Period Activity: Completed sewer extensions including Fanta Road sewer extension (100 feet of 8-inch PVC sewer) and Pondview Lane sewer extension (500 feet of 8-inch PVC sewer).

MWRA I/I Local Financial Assistance Program: The community has financed one (1) I/I reduction project through the Authority's funding assistance program. Of the \$1,356,100 allotted through the Program's Phases 1-4, the community has \$380,700 remaining in funding assistance.

29. REVERE: North System

Background Information:

- Miles of Sewer: 78
- Sewered Population: 41,047
- Three Year ('99-'01) Annual Average I/I: 4.37 mgd
- Massachusetts DEP Administrative Order: No. 837, issued on April 21, 1991.

Latest I/I or SSES Report: SSES Phase 3, August 1999.

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

I/I Rehabilitation Projects in Design or Construction: The City lined sewers on 3 streets totaling 4430 feet. Developer Flow Reduction (10 for 1) was used to fund these rehabilitation projects. Point repairs were made on John Avenue to fix a collapsed 8" sewer.

Reporting Period Activity: The City extended approximately 200 feet of 8” sewer along Walnut Street to service 3 new homes.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority’s funding assistance program. Of the \$2,902,900 allotted through the Program’s Phases 1-4, the community has \$1,571,400 remaining in funding assistance.

30. SOMERVILLE: North System

Background Information:

- Miles of Sewer: 127.9
- Sewered Population: 77,478
- Three Year (‘99-’01) Annual Average I/I: 6.99 mgd
- Massachusetts DEP Administrative Order: No. NON-NE-00-1006 Issued January 21, 2000.

Latest I/I or SSES Report: Sewer System Rehabilitation Design (Final), April 2002.

Private Source Inflow Removal Program: Approximately 20 additional homes were inspected, no illegal connections were found.

I/I Rehabilitation Projects in Design or Construction: The City is continuing with the ongoing maintenance program repairing catch basins, manholes, and sewer segments. The community has spent approximately \$540,000 in the last 12 months on this program with an estimated I/I reduction of 2,000 gpd.

Somerville is one of MWRA's combined sewer service communities. As part of the MWRA CSO Facilities Upgrade Project, Somerville’s flows are being evaluated for volume and discharge locations.

Reporting Period Activity: Developers are now required to meet a 4:1 I/I removal ratio for new sewer projects.

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 \$4,823,800 allotted through the Program’s Phases 1-4, the community has \$3,934,100 remaining in funding assistance.

31. STONEHAM: North System

Background Information:

- Miles of Sewer: 63
- Sewered Population: 21,664
- Three Year ('99-'01) Annual Average I/I: 2.08 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Infrastructure Maintenance Management Program Phase 2, January 1999.

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

I/I Rehabilitation Projects in Design or Construction: Flow monitoring is continuing. The Phase 7 TV inspection began on May 1, 2003 using aqua-zoom to videotape manholes and line segments to pinpoint locations for follow-up in-line camera work. Total replacement of the sewer main, manholes and service connections (as needed) on Summer Street between Main Street and Pond Street and a segment of the Pond Street main has been completed.

Reporting Period Activity: Channel grinders have been installed at the Northwest and Upland Road pumping stations. A new second pump has been installed at the East Side (Rita Road) pumping station where a new sluice gate will be installed, which will change the operation of the station. The new pump will become the primary pump.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$1,635,900 of funding assistance.

32. STOUGHTON: South System

Background Information:

- Miles of Sewer: 90
- Sewered Population: 17,375
- Three Year ('99-'01) Annual Average I/I: 2.30 mgd
- Massachusetts DEP Administrative Order: No. 538, issued on June 17, 1984.

Latest I/I or SSES Report: Phase VI SSES, February 2003.

Private Source Inflow Removal Program: TV inspection of service connections is ongoing.

I/I Rehabilitation Projects in Design or Construction: Phase VI sewer rehabilitation is ongoing.

Reporting Period Activity: Phase V rehabilitation construction is complete and the York Street Pump Station rehabilitation is complete.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$1,436,900 of funding assistance.

33. WAKEFIELD: North System

Background Information:

- Miles of Sewer: 90
- Sewered Population: 23,765
- Three Year ('99-'01) Annual Average I/I: 3.18 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Sub-Area 6 SSES, Sept. 2003.

Private Source Inflow Removal Program: SSES work commencing September 2003 will be investigating sources in Sub-Area 6.

I/I Rehabilitation Projects in Design or Construction: The Town cleaned and repaired approximately 1,800 L.F. of 16" interceptor sewer between New Salem Street and Water Street to reduce surcharging in the system.

Reporting Period Activity: Upgrading of the Farm Street Pump Stations is completed and operational. Audubon Road Pump Station and West Park Drive Pump Station upgrades, are ongoing.

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 \$1,824,900 allotted through the Program's Phases 1-4, the community has \$328,300 remaining in funding assistance.

34. WALPOLE: South System

Background Information:

- Miles of Sewer: 64
- Sewered Population: 14,607
- Three Year ('99-'01) Annual Average I/I: 1.39 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: SSES Phases 1 and 2, June 2002.

Private Source Inflow Removal Program: There has been two private inflow sources identified. One sump pump and one driveway drain. The Town is establishing a plan with the homeowners for removal.

I/I Rehabilitation Projects in Design or Construction: The Phase II I/I removal project is currently under investigation by a new consulting firm to achieve the most cost effective plan. Developers continue to remove infiltration as part of the ongoing 2:1 ratio I/I removal program.

Reporting Period Activity: Phase I sewer rehabilitation is complete. The project removed approximately 429,000 gpd of I/I.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$1,139,000 of funding assistance.

35. WALTHAM: North System

Background Information:

- Miles of Sewer: 138
- Sewered Population: 59,167
- Three Year ('99-'01) Annual Average I/I: 6.63 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: The SSES Program and additional metering are ongoing. An I/I Analysis was completed in June 1999.

Private Source Inflow Removal Program: As of July 2003, The City has inspected 36 municipal buildings (not including schools) and 530 private homes. In total, the City has found 45 properties with active sources of inflow and 20 properties with possible sources of inflow.

I/I Rehabilitation Projects in Design or Construction: Sewer Rehabilitation (Contract 02-2) is ongoing and scheduled to be complete in September 2003. The Beaver Brook Sewer Rehabilitation design is complete and construction due to start August 2003. Sewer Rehabilitation for Hobbs Brook, Metropolitan State Hospital and Carter/Felton/Elm Streets are in preparation to go to bid.

Reporting Period Activity: The City is in the early stages of the development of a Sewer Bank Program. The City's Private Inflow Source Removal Program will finish the inspection stage this summer and begin notifying property owners of illicit connections.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$4,212,400 of funding assistance.

36. WATERTOWN: North System

Background Information:

- Miles of Sewer: 75
- Sewered Population: 32,986
- Three Year ('99-'01) Annual Average I/I: 2.09 mgd
- Massachusetts DEP Administrative Order: ACOP-NE-97-5004

Latest I/I or SSES Report: I/I&SSES Analysis Draft Report dated September 2000.

Private Source Inflow Removal Program: The Town has performed smoke testing of 11,800 feet of sanitary sewer, used to help identify storm drain and sanitary conductivity issues.

I/I Rehabilitation Projects in Design or Construction: The Town issued a contract for catch basin rebuilding and repair beginning July 2003.

Reporting Period Activity: Watertown is moving forward with the drain improvements and sewer replacements in the Parker Street and Falmouth Road areas. Over the past year, 1 sewer lateral and 7 collapsed sewer mains have been repaired.

MWRA I/I Local Financial Assistance Program: The community has financed one (1) I/I investigation project through the Authority's funding assistance program. Of the \$2,041,800 allotted through the Program's Phases 1-4, the community has \$1,719,235 remaining in funding assistance.

37. WELLESLEY: South System

Background Information:

- Miles of Sewer: 130
- Sewered Population: 25,309
- Three Year ('99-'01) Annual Average I/I: 2.28 mgd
- Massachusetts DEP Administrative Order: No. 579, issued on May 23, 1985.

Latest I/I or SSES Report: Phase 2 SSES, November 1994.

Private Source Inflow Removal Program: The DPW has begun contacting the owners of illegal sump pumps, based on previous private source inflow studies. Each property will be assessed on a case by case basis to determine the best alternative.

I/I Rehabilitation Projects in Design or Construction: In July 2003, bids were opened for Contract No. 04C-50-05 (Sewer Rehabilitation in the Wellesley Farms Area). The project will involve the cleaning and television inspection of approximately 57,660 feet of sanitary sewer to determine the structural condition of the pipe.

Reporting Period Activity: The Town has begun a phased program to replace or rehabilitate its existing 15 pneumatic ejector stations and 4 package sewage pump stations. At the present time, the first of the lift stations is undergoing improvement design.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$1,751,700 allotted through the Program's Phases 1-4, the community has \$1,295,760 remaining in funding assistance.

38. WESTWOOD: South System

Background Information:

- Miles of Sewer: 81
- Sewered Population: 12,490
- Three Year ('99-'01) Annual Average I/I: 1.09 mgd
- Massachusetts DEP Administrative Order: No. 578, issued on May 23, 1985.

Latest I/I or SSES Report: SSES Phases 1 and 2, January 1991.

Private Source Inflow Removal Program: House surveys, as part of the CY02 Annual Inspection Program, have been completed. Approximately 580 homes were surveyed and 8 were identified with illicit connections. CY03 Annual Inspection Program is ongoing.

I/I Rehabilitation Projects in Design or Construction: The maintenance program for FY02 has been completed. The program included television inspection of five miles of sewer, the testing and sealing of 5 sewer manholes, and house surveys to identify illicit connections to the sewer system. The manhole sealing eliminated an estimated 8,200 gpd of I/I.

Reporting Period Activity: The construction of 1,700 feet of new sewer laterals on Grove Street is complete.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$733,300 of funding assistance.

39. WEYMOUTH: South System

Background Information:

- Miles of Sewer: 240
- Sewered Population: 50,900
- Three Year ('99-'01) Annual Average I/I: 4.98 mgd
- Massachusetts DEP Administrative Order: No. 543, issued on November 14, 1984.
A new ACO was signed in 1999.

Latest I/I or SSES Report: Sewer System Capital Improvement Program, July 2002.

Private Source Inflow Removal Program: 297 sump pumps were redirected for an estimated 148,500 gpd of I/I removal.

I/I Rehabilitation Projects in Design or Construction: Rehabilitation of the Pond Street and Alton Terrace sewers is complete. The Town has completed 1,400 manhole inspections in the Southeast and Landing sub-basins. Flow isolation and smoke testing in North Weymouth and Mill River is complete. Project S02-1 Rehabilitation Construction is ongoing.

Reporting Period Activity: The Town completed the design of Contracts 2 and 5 of the Capital Improvement Projects. The Town started construction on converting 4 ejector stations to submersible. Television inspection for Lower Central and Old Swamp sub-basins is complete. The Town has replaced 1,996 feet of 8-inch sewer in the past year. Fort Point Road water and sewer rehabilitation is in the construction stage.

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I reduction projects through the Authority's funding assistance program. Of the \$3,517,900 allotted through the Program's Phases 1-4, the community has \$310,959 remaining in funding assistance.

40. WILMINGTON: North System

Background Information:

- Miles of Sewer: 20
- Sewered Population: 3,832
- Three Year ('99-'01) Annual Average I/I: 0.78 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Infrastructure Maintenance & Management Program (IMMP): Phase I Study Area, August 2002.

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

I/I Rehabilitation Projects in Design or Construction: Bid documents for a multi-year sewer rehabilitation contract are complete and the project was bid in September 2002. Rehabilitation is based on the IMMP and Aqua Zoom inspection results.

Reporting Period Activity: To date, 23,000 feet of pipeline has been cleaned and CCTV inspected since the start of the Infrastructure Maintenance and Management Program. The Town completed the installation of 2,200 feet of 8-inch PVC sewer.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. The community has spent its entire \$740,000 of funding assistance.

41. WINCHESTER: North System

Background Information:

- Miles of Sewer: 83
- Sewered Population: 20,789
- Three Year ('99-'01) Annual Average I/I: 1.62 mgd
- Massachusetts DEP Administrative Order: ACO proposed in 2001.

Latest I/I or SSES Report: I/I Removal Report, April 1994.

Private Source Inflow Removal Program: Approximately 109 private inflow sources have been disconnected to date.

I/I Rehabilitation Projects in Design or Construction: None

Reporting Period Activity: Severn Trent Environmental Services has completed their contract to clean, TV inspect, and seal approximately 60,000 feet of sewer lines.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$1,324,000 allotted through the Program's Phases 1-4, the community has \$371,700 remaining in funding assistance.

42. WINTHROP: North System

Background Information:

- Miles of Sewer: 34
- Sewered Population: 18,303
- Three Year ('99-'01) Annual Average I/I: 1.13 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Preliminary Design Report/Shirley Street Sewer Rehab., July 2002

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

I/I Rehabilitation Projects in Design or Construction: The Town has recently completed the Shirley Street Rehabilitation Project. The project included replacement of 170 L.F. of sewer line, cured-in-place lining of 3,350 L.F. of sewer line and sealing of 18 manholes.

Reporting Period Activity: The Town is preparing a construction contract to eliminate cost-effective inflow sources.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$1,062,400

allotted through the Program's Phases 1-4, the community has \$775,300 remaining in funding assistance.

43. WOBURN: North System

Background Information:

- Miles of Sewer: 138
- Sewered Population: 36,327
- Three Year ('99-'01) Annual Average I/I: 4.91 mgd
- Massachusetts DEP Administrative Order: ACO-NE-01-1005, dated August 16, 2001

Latest I/I or SSES Report: Dix Road SSES, ongoing.

Private Source Inflow Removal Program: A Draft Sewer Use Ordinance and Inflow Program that more complies with 360 CMR 10 has been completed and is being reviewed by the Mayor and City Council. Some of the important revisions include: a clear definition of service connection ownership; a detailed description of sewer bank procedures; Specific prohibition of inflow sources such as sump pumps, roof leaders and driveway drains; and improved grease management requirements.

I/I Rehabilitation Projects in Design or Construction: The City has started preparing a program to remove illegal connections to its sanitary sewer system. The City continues working on this pilot project and will eventually develop a citywide program.

Reporting Period Activity: Many projects are in the planning/funding stages and will be performed during the upcoming year.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$3,322,500 allotted through the Program's Phases 1-4, the community has \$952,300 remaining in funding assistance.

ATTACHMENT 7
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY03
Reporting Period – July 2002 Through June 2003

CY02 COMMUNITY WASTEWATER FLOW DATA

This attachment contains calendar year 2002 wastewater flow data for the 43 MWRA member sewer communities. There are three separate data tables. The first table (one page) presents the CY02 monthly total wastewater flow estimates for each community derived from MWRA's wastewater metering system. Each community's percent average daily flow and percent maximum month flow are used as components of MWRA's annual wholesale sewer charge. The second table (one page) presents the CY02 community flow components (sanitary flow, infiltration, and stormwater inflow) as estimated by MWRA. The third table (three pages) presents the estimated community flow components in two formats: (1) alphabetically and (2) sorted (ranked) from high to low.

CY02 MWRA WASTEWATER METERING SYSTEM COMMUNITY FLOW ESTIMATES

Community	Total Population	Sewered Population	CY02 Average Daily Flow (ADF) By Calendar Month (MGD)												12 Month Average Daily Flow (MGD)	Percent Average Daily Flow	Max. Month ADF (MGD)	Percent Max. Month ADF
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
			Arlington	42,389	42,347	4.44	4.90	5.60	6.05	6.42	5.43	4.08	3.57	3.83				
Ashland	14,674	9,685	0.92	0.97	1.03	0.97	1.05	1.03	0.82	0.86	0.87	0.97	1.19	1.47	1.01	0.3%	1.47	0.3%
Bedford	12,595	11,084	2.41	2.60	2.93	3.02	3.22	2.90	2.24	2.03	2.08	2.18	2.59	3.44	2.64	0.8%	3.44	0.8%
Belmont	24,194	23,686	2.79	2.92	3.60	3.79	4.10	3.57	2.58	2.32	2.47	2.72	3.99	5.17	3.34	1.0%	5.17	1.2%
BWSC	589,141	553,793	88.05	87.61	98.32	101.24	111.25	100.59	85.53	81.13	88.85	86.96	110.98	123.96	97.08	30.2%	123.96	28.4%
Braintree	33,828	33,794	6.26	6.84	7.82	7.49	8.27	7.41	5.47	4.64	4.79	5.06	7.84	9.65	6.79	2.1%	9.65	2.2%
Brookline	57,107	56,536	8.15	8.95	9.95	9.97	11.11	9.78	7.75	6.96	7.89	7.56	11.04	14.03	9.43	2.9%	14.03	3.2%
Burlington	22,876	21,995	2.73	3.10	3.54	3.93	4.38	4.06	3.01	2.70	2.74	2.85	3.54	4.71	3.44	1.1%	4.71	1.1%
Cambridge	101,355	101,254	15.74	15.37	18.06	17.71	20.85	19.54	16.07	15.77	16.74	17.68	20.88	21.06	17.97	5.6%	21.06	4.8%
Canton	20,775	16,620	2.80	2.85	3.11	3.15	3.32	2.96	2.51	2.54	2.62	2.59	3.33	3.87	2.97	0.9%	3.87	0.9%
Chelsea	35,080	35,080	3.80	3.75	3.47	3.45	4.17	3.57	2.69	2.51	4.17	4.29	5.47	5.52	3.90	1.2%	5.52	1.3%
Dedham	23,464	22,056	4.41	5.01	5.23	5.66	5.83	5.26	3.10	2.34	2.41	2.84	5.40	7.68	4.59	1.4%	7.68	1.8%
Everett	38,037	37,999	5.38	5.85	6.20	6.36	6.91	6.64	5.33	4.52	4.88	5.05	6.33	6.88	5.86	1.8%	6.91	1.6%
Framingham	66,910	62,226	5.54	5.74	6.17	6.59	7.18	6.91	5.93	5.72	5.24	5.35	6.58	8.52	6.29	2.0%	8.52	1.9%
Hingham	6,782	6,124	1.06	1.24	1.49	1.36	1.37	1.41	0.90	0.70	0.74	0.78	1.54	2.21	1.23	0.4%	2.21	0.5%
Holbrook	10,785	8,326	0.83	0.86	0.95	0.87	0.86	0.73	0.61	0.60	0.77	0.78	0.95	1.15	0.83	0.3%	1.15	0.3%
Lexington	30,355	28,625	4.25	4.77	5.80	6.55	7.06	6.69	4.51	3.59	3.69	3.87	5.70	8.17	5.39	1.7%	8.17	1.9%
Malden	56,340	56,284	8.14	8.50	9.35	9.65	10.53	9.38	7.39	6.57	7.12	7.96	10.78	12.33	8.98	2.8%	12.33	2.8%
Medford	55,765	55,709	7.50	8.19	9.60	9.64	10.76	9.66	7.06	6.39	7.08	7.30	10.24	13.22	8.89	2.8%	13.22	3.0%
Melrose	27,134	27,107	2.78	3.50	4.56	5.00	5.62	4.43	2.51	1.94	2.36	2.90	5.33	6.69	3.97	1.2%	6.69	1.5%
Milton	26,062	24,498	3.20	3.60	4.49	4.57	4.85	4.11	2.63	2.12	2.26	2.51	4.82	6.67	3.82	1.2%	6.67	1.5%
Natick	32,170	26,798	3.08	3.18	3.56	3.84	3.99	3.75	2.98	2.62	2.59	2.62	3.33	4.55	3.34	1.0%	4.55	1.0%
Needham	28,911	26,887	4.17	4.45	5.06	5.43	5.78	5.08	4.05	3.56	3.83	3.57	4.66	6.17	4.65	1.4%	6.17	1.4%
Newton	83,829	82,152	11.92	13.07	15.03	16.66	17.99	16.18	11.40	9.50	10.35	10.75	15.38	19.90	14.01	4.4%	19.90	4.6%
Norwood	28,587	28,558	5.05	5.21	5.85	6.21	6.90	5.65	3.96	3.49	3.80	3.95	6.33	8.49	5.41	1.7%	8.49	1.9%
Quincy	88,025	87,937	11.40	12.04	13.57	13.87	14.79	14.22	12.32	11.31	11.14	11.35	15.50	17.60	13.26	4.1%	17.60	4.0%
Randolph	30,963	30,715	2.95	3.07	3.51	3.48	3.75	3.47	2.72	2.45	2.61	2.78	3.80	4.91	3.29	1.0%	4.91	1.1%
Reading	23,708	22,262	2.23	2.50	2.85	3.01	3.31	2.86	1.92	1.66	1.75	1.96	2.65	3.66	2.53	0.8%	3.66	0.8%
Revere	47,283	47,047	6.38	7.90	6.93	7.46	8.44	7.44	5.71	5.23	6.08	6.18	8.30	8.90	7.07	2.2%	8.90	2.0%
Somerville	77,478	77,401	10.14	9.83	11.17	10.46	11.17	9.47	6.73	7.36	8.40	8.22	9.56	11.29	9.48	3.0%	11.29	2.6%
Stonham	22,219	21,664	2.91	2.95	3.39	3.45	3.56	3.57	2.87	2.47	2.49	2.66	3.61	4.14	3.17	1.0%	4.14	0.9%
Stoughton	27,149	17,375	2.84	3.10	3.63	3.57	3.94	3.48	2.37	1.92	2.20	2.41	3.39	4.62	3.12	1.0%	4.62	1.1%
Wakefield	24,804	23,745	3.64	3.98	4.66	5.29	5.90	5.22	3.46	2.89	2.94	3.18	4.77	6.65	4.38	1.4%	6.65	1.5%
Walpole	22,824	14,607	1.66	1.81	1.99	2.15	2.31	2.13	1.60	1.39	1.59	1.69	2.04	2.63	1.92	0.6%	2.63	0.6%
Waltham	59,226	59,167	8.55	9.56	10.82	11.55	11.96	11.10	8.62	7.75	7.97	8.34	10.83	13.12	10.01	3.1%	13.12	3.0%
Watertown	32,986	32,986	3.07	3.22	3.55	3.75	3.94	3.49	2.70	2.48	2.62	2.82	4.03	4.91	3.38	1.1%	4.91	1.1%
Wellesley	26,613	25,309	3.08	3.41	4.02	4.43	4.71	4.08	2.70	2.28	2.61	2.74	3.81	5.64	3.63	1.1%	5.64	1.3%
Westwood	14,117	12,282	1.44	1.53	1.72	1.83	1.96	1.85	1.30	1.14	1.14	1.20	1.70	2.55	1.61	0.5%	2.55	0.6%
Weymouth	53,988	50,749	7.52	8.17	9.18	8.71	9.30	8.16	5.85	5.11	5.70	6.42	9.92	12.12	8.01	2.5%	12.12	2.8%
Wilmington	21,363	3,632	1.59	1.70	1.70	1.83	1.85	1.76	1.48	1.40	1.38	1.41	1.59	1.79	1.62	0.5%	1.85	0.4%
Winchester	20,810	20,789	2.12	2.39	3.01	3.24	3.58	3.09	2.07	1.80	1.83	1.96	2.89	4.30	2.69	0.8%	4.30	1.0%
Winthrop	18,303	18,303	1.88	1.89	2.03	2.13	2.26	2.02	1.69	1.69	1.73	1.83	2.55	2.60	2.03	0.6%	2.60	0.6%
Woburn	37,258	36,327	6.01	7.70	10.08	10.65	12.21	10.79	6.63	6.35	6.64	6.74	8.71	12.13	8.72	2.7%	12.21	2.8%
Total/Average	2,118,262	2,001,517	284.81	299.78	338.57	350.00	382.71	344.92	267.85	245.37	264.99	271.16	363.99	437.07	321.00	100%	437.24	100%

2002 MWRA COMMUNITY WASTEWATER FLOW COMPONENT ESTIMATES (CY02 - 12 MONTHS)

06-Feb-03

COMMUNITY						2002 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	42,389	42,347	321	106	7	5.22	1.62%	4.69	2.08	39.8%	2.61	50.0%	0.53	10.2%	8.00	1.81%
Ashland	14,674	9,685	2	43	2	1.02	0.32%	0.93	0.33	32.4%	0.60	58.8%	0.08	7.8%	1.47	0.33%
Bedford	12,595	11,084	2	68	2	2.64	0.82%	2.45	1.20	45.5%	1.25	47.3%	0.18	6.8%	3.44	0.78%
Belmont	24,194	23,686	2	78	2	3.34	1.04%	2.87	1.37	41.0%	1.50	44.9%	0.47	14.1%	5.17	1.17%
BWSC (5)	589,141	553,793	234	840	33	97.08	30.14%	81.41	26.41	27.2%	55.00	56.7%	15.66	16.1%	123.96	28.12%
Braintree	33,828	33,794	15	133	7	6.97	2.16%	6.10	3.81	54.7%	2.29	32.9%	0.87	12.5%	11.71	2.66%
Brookline	57,107	56,536	9	102	12	9.43	2.93%	8.48	4.34	46.0%	4.13	43.8%	0.95	10.1%	14.03	3.18%
Burlington	22,876	21,995	0	115	1	3.44	1.07%	3.23	1.81	52.6%	1.42	41.3%	0.21	6.1%	4.71	1.07%
Cambridge (5)	101,355	101,254	116	150	9	17.97	5.58%	14.94	6.58	36.6%	8.36	46.5%	3.03	16.9%	21.06	4.78%
Canton	20,775	16,620	63	62	6	2.97	0.92%	2.70	1.56	52.5%	1.14	38.4%	0.27	9.1%	3.87	0.88%
Chelsea (5)	35,080	35,080	40	41	5	3.90	1.21%	3.08	0.80	20.5%	2.28	58.5%	0.83	21.3%	5.52	1.25%
Dedham	23,464	22,056	25	76	6	4.59	1.43%	3.93	2.43	52.9%	1.50	32.7%	0.66	14.4%	7.68	1.74%
Everett	38,037	37,999	20	57	7	5.86	1.82%	5.12	2.70	46.1%	2.42	41.3%	0.73	12.5%	6.91	1.57%
Framingham	66,910	62,226	4	275	4	6.98	2.17%	6.47	2.10	30.1%	4.37	62.6%	0.51	7.3%	9.73	2.21%
Hingham	6,782	6,124	1	31	1	1.23	0.38%	1.06	0.63	51.2%	0.43	35.0%	0.17	13.8%	2.21	0.50%
Holbrook	10,785	8,326	2	31	2	0.83	0.26%	0.78	0.28	33.7%	0.50	60.2%	0.05	6.0%	1.15	0.26%
Lexington	30,355	28,625	17	151	4	5.39	1.67%	4.97	2.51	46.6%	2.46	45.6%	0.42	7.8%	8.17	1.85%
Malden	56,340	56,284	242	99	6	8.98	2.79%	8.08	4.18	46.5%	3.90	43.4%	0.89	9.9%	12.33	2.80%
Medford	55,765	55,709	71	113	6	8.89	2.76%	7.74	3.85	43.3%	3.89	43.8%	1.15	12.9%	13.22	3.00%
Melrose	27,134	27,107	187	74	5	3.97	1.23%	3.26	1.57	39.5%	1.69	42.6%	0.71	17.9%	6.69	1.52%
Milton	26,062	24,498	45	83	14	3.82	1.19%	3.24	1.77	46.3%	1.47	38.5%	0.58	15.2%	6.67	1.51%
Natick	32,170	26,798	27	107	4	3.34	1.04%	3.09	1.33	39.8%	1.76	52.7%	0.25	7.5%	4.55	1.03%
Needham	28,911	26,887	21	115	2	4.65	1.44%	4.18	2.38	51.2%	1.80	38.7%	0.47	10.1%	6.17	1.40%
Newton	83,829	82,152	51	271	7	14.01	4.35%	12.67	6.01	42.9%	6.66	47.5%	1.34	9.6%	19.90	4.51%
Norwood	28,587	28,558	30	83	6	5.41	1.68%	4.59	2.74	50.6%	1.85	34.2%	0.82	15.2%	8.49	1.93%
Quincy	88,025	87,937	56	202	6	13.47	4.18%	12.38	6.92	51.4%	5.46	40.5%	1.09	8.1%	17.99	4.08%
Randolph	30,963	30,715	2	101	2	3.29	1.02%	3.05	1.21	36.8%	1.84	55.9%	0.24	7.3%	4.91	1.11%
Reading	23,708	22,262	2	86	2	2.53	0.79%	2.35	0.85	33.6%	1.50	59.3%	0.18	7.1%	3.66	0.83%
Revere	47,283	47,047	3	78	1	7.07	2.20%	5.98	2.68	37.9%	3.30	46.7%	1.09	15.4%	8.90	2.02%
Somerville (5)	77,478	77,401	43	107	7	9.48	2.94%	7.37	2.71	28.6%	4.66	49.2%	2.11	22.3%	11.29	2.56%
Stonham	22,219	21,664	23	63	7	3.17	0.98%	2.91	0.97	30.6%	1.94	61.2%	0.26	8.2%	4.14	0.94%
Stoughton	27,149	17,375	1	60	2	3.12	0.97%	2.79	1.73	55.4%	1.06	34.0%	0.33	10.6%	4.62	1.05%
Wakefield	24,804	23,745	10	82	2	4.38	1.36%	3.96	2.27	51.8%	1.69	38.6%	0.42	9.6%	6.65	1.51%
Walpole	22,824	14,607	1	56	2	1.92	0.60%	1.71	0.80	41.7%	0.91	47.4%	0.20	10.4%	2.63	0.60%
Waltham	59,226	59,167	3	138	3	10.01	3.11%	9.24	4.84	48.4%	4.40	44.0%	0.77	7.7%	13.12	2.98%
Watertown	32,986	32,986	14	75	3	3.38	1.05%	3.08	1.01	29.9%	2.07	61.2%	0.30	8.9%	4.91	1.11%
Wellesley	26,613	25,309	2	130	3	3.63	1.13%	3.19	1.57	43.3%	1.62	44.6%	0.44	12.1%	5.64	1.28%
Westwood	14,117	12,282	3	77	3	1.61	0.50%	1.46	0.71	44.1%	0.75	46.6%	0.16	9.9%	2.55	0.58%
Weymouth	53,988	50,749	17	238	4	8.01	2.49%	7.30	4.12	51.4%	3.18	39.7%	0.71	8.9%	12.12	2.75%
Wilmington	21,363	3,632	2	19	1	1.62	0.50%	1.57	0.67	41.4%	0.90	55.6%	0.05	3.1%	1.85	0.42%
Winchester	20,810	20,789	72	83	7	2.69	0.84%	2.43	1.17	43.5%	1.26	46.8%	0.26	9.7%	4.30	0.98%
Winthrop	18,303	18,303	21	36	6	2.03	0.63%	1.83	0.73	36.0%	1.10	54.2%	0.19	9.4%	2.60	0.59%
Woburn	37,258	36,327	18	141	13	8.72	2.71%	7.82	3.63	41.6%	4.19	48.1%	0.90	10.3%	12.21	2.77%
Totals/Averages	2,118,262	2,001,517	1,840	5,076	234	322.06	100.00%	280.48	123.36	38.3%	157.11	48.8%	41.53	12.9%	440.90	100.00%

FOOTNOTES:

- (1) Figures tabulated using data from the MWRA Wastewater Metering System for Calendar Year 2002.
- (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 2002 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

2002 Final Community Wastewater Flow Component Estimates (Alphabetical)

Community	Sewered Population	Miles of Local Sewers	IDM of Local Sewers	Average Daily Flow ADF (MGD)	Average Annual Infiltration (MGD)	Average Annual Inflow (MGD)	Average Sanitary Flow (MGD)	ADF (GPD) Per IDM	I/I (GPD) Per IDM	Infiltration (GPD) Per IDM	Inflow (GPD) Per IDM	Inflow (GPD) Per Sewer Mile	Average Sanitary (GPD) Per Sew. Pop.
Arlington	42,347	106	896	5.22	2.08	0.53	2.61	5,826	2,913	2,321	592	4,989	62
Ashland	9,685	43	390	1.02	0.33	0.08	0.60	2,615	1,051	846	205	1,865	62
Bedford	11,084	68	552	2.64	1.20	0.18	1.25	4,783	2,500	2,174	326	2,647	113
Belmont	23,686	78	708	3.34	1.37	0.47	1.50	4,718	2,599	1,935	664	6,057	63
BWSC	553,793	840	14,024	97.08	26.41	15.66	55.00	6,922	3,000	1,883	1,117	18,641	99
Braintree	33,794	133	1,215	6.79	3.86	0.64	2.29	5,588	3,704	3,177	527	4,827	68
Brookline	56,536	102	1,090	9.43	4.34	0.95	4.13	8,651	4,853	3,982	872	9,358	73
Burlington	21,995	115	1,042	3.44	1.81	0.21	1.42	3,301	1,939	1,737	202	1,826	65
Cambridge	101,254	150	2,344	17.97	6.58	3.03	8.36	7,666	4,100	2,807	1,293	20,197	83
Canton	16,620	62	567	2.97	1.56	0.27	1.14	5,238	3,228	2,751	476	4,357	69
Chelsea	35,080	41	618	3.90	0.80	0.83	2.28	6,311	2,638	1,294	1,343	20,063	65
Dedham	22,056	76	712	4.59	2.43	0.66	1.50	6,447	4,340	3,413	927	8,642	68
Everett	37,999	57	686	5.86	2.70	0.73	2.42	8,542	5,000	3,936	1,064	12,707	64
Frammingham	62,226	275	2,519	6.29	1.49	0.43	4.37	2,497	762	592	171	1,564	70
Hingham	6,124	31	270	1.23	0.63	0.17	0.43	4,556	2,963	2,333	630	5,484	70
Holbrook	8,326	31	312	0.83	0.28	0.05	0.50	2,660	1,058	897	160	1,613	60
Lexington	28,625	151	1,487	5.39	2.51	0.42	2.46	3,625	1,970	1,688	282	2,780	86
Malden	56,284	99	876	8.98	4.18	0.89	3.90	10,251	5,788	4,772	1,016	8,963	69
Medford	55,709	113	982	8.89	3.85	1.15	3.89	9,053	5,092	3,921	1,171	10,156	70
Melrose	27,107	74	635	3.97	1.57	0.71	1.69	6,252	3,591	2,472	1,118	9,653	62
Milton	24,498	83	680	3.82	1.77	0.58	1.47	5,618	3,456	2,603	853	6,986	60
Natick	26,798	107	954	3.34	1.33	0.25	1.76	3,501	1,656	1,394	262	2,337	66
Needham	26,887	115	1,075	4.65	2.38	0.47	1.80	4,326	2,651	2,214	437	4,084	67
Newton	82,152	271	2,579	14.01	6.01	1.34	6.66	5,432	2,850	2,330	520	4,945	81
Norwood	28,558	83	763	5.41	2.74	0.82	1.85	7,090	4,666	3,591	1,075	9,902	65
Quincy	87,937	202	1,956	13.26	6.44	1.36	5.46	6,779	3,988	3,292	695	6,733	62
Randolph	30,715	101	1,138	3.29	1.21	0.24	1.84	2,891	1,274	1,063	211	2,376	60
Reading	22,262	86	747	2.53	0.85	0.18	1.50	3,387	1,379	1,138	241	2,094	67
Revere	47,047	78	832	7.07	2.68	1.09	3.30	8,498	4,531	3,221	1,310	13,974	70
Somerville	77,401	107	1,523	9.48	2.71	2.11	4.66	6,225	3,165	1,779	1,385	19,641	60
Stoneham	21,664	63	517	3.17	0.97	0.26	1.94	6,132	2,379	1,876	503	4,127	90
Stoughton	17,375	60	621	3.12	1.73	0.33	1.06	5,024	3,317	2,786	531	5,537	61
Wakefield	23,745	82	842	4.38	2.27	0.42	1.69	5,202	3,195	2,696	499	5,106	71
Walpole	14,607	56	577	1.92	0.80	0.20	0.91	3,328	1,733	1,386	347	3,571	62
Waltham	59,167	138	1,289	10.01	4.84	0.77	4.40	7,766	4,352	3,755	597	5,575	74
Watertown	32,986	75	616	3.38	1.01	0.30	2.07	5,487	2,127	1,640	487	3,997	63
Wellesley	25,309	130	1,271	3.63	1.57	0.44	1.62	2,856	1,581	1,235	346	3,385	64
Westwood	12,282	77	627	1.61	0.71	0.16	0.75	2,568	1,388	1,132	255	2,078	61
Weymouth	50,749	238	2,272	8.01	4.12	0.71	3.18	3,526	2,126	1,813	313	2,983	63
Wilmington	3,632	19	259	1.62	0.67	0.05	0.90	6,255	2,780	2,587	193	2,647	248
Winchester	20,789	83	633	2.69	1.17	0.26	1.26	4,250	2,259	1,848	411	3,133	61
Winthrop	18,303	36	309	2.03	0.73	0.19	1.10	6,570	2,977	2,362	615	5,319	60
Woburn	36,327	141	1,393	8.72	3.63	0.90	4.19	6,260	3,252	2,606	646	6,382	115
Average	46,547	118	1,288	7.46	2.84	0.96	3.65	5,453	2,934	2,309	625	6,588	74
Total	2,001,517	5,076	55,398	320.98	122.32	41.49	157.11	234,470	126,168	99,282	26,886	283,301	3,191

2002 Final Community Wastewater Flow Component Estimates (Ranked)

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)
BWSC	553,793	BWSC	840	BWSC	14,024	BWSC	97.08	BWSC	26.41	BWSC	15.66
Cambridge	101,254	Framingham	275	Newton	2,579	Cambridge	17.97	Cambridge	6.58	Cambridge	3.03
Quincy	87,937	Newton	271	Framingham	2,519	Newton	14.01	Quincy	6.44	Somerville	2.11
Newton	82,152	Weymouth	238	Cambridge	2,344	Quincy	13.26	Newton	6.01	Quincy	1.36
Somerville	77,401	Quincy	202	Weymouth	2,272	Waltham	10.01	Waltham	4.84	Newton	1.34
Framingham	62,226	Lexington	151	Quincy	1,956	Somerville	9.48	Brookline	4.34	Medford	1.15
Waltham	59,167	Cambridge	150	Somerville	1,523	Brookline	9.43	Malden	4.18	Revere	1.09
Brookline	56,536	Woburn	141	Lexington	1,487	Malden	8.98	Weymouth	4.12	Brookline	0.95
Malden	56,284	Waltham	138	Woburn	1,393	Medford	8.89	Braintree	3.86	Woburn	0.90
Medford	55,709	Braintree	133	Waltham	1,289	Woburn	8.72	Medford	3.85	Malden	0.89
Weymouth	50,749	Wellesley	130	Wellesley	1,271	Weymouth	8.01	Woburn	3.63	Chelsea	0.83
Revere	47,047	Needham	115	Braintree	1,215	Revere	7.07	Norwood	2.74	Norwood	0.82
Arlington	42,347	Burlington	115	Randolph	1,138	Braintree	6.79	Somerville	2.71	Waltham	0.77
Everett	37,999	Medford	113	Brookline	1,090	Framingham	6.29	Everett	2.70	Everett	0.73
Woburn	36,327	Somerville	107	Needham	1,075	Everett	5.86	Revere	2.68	Melrose	0.71
Chelsea	35,080	Natick	107	Burlington	1,042	Norwood	5.41	Lexington	2.51	Weymouth	0.71
Braintree	33,794	Arlington	106	Medford	982	Lexington	5.39	Dedham	2.43	Dedham	0.66
Watertown	32,986	Brookline	102	Natick	954	Arlington	5.22	Needham	2.38	Braintree	0.64
Randolph	30,715	Randolph	101	Arlington	896	Needham	4.65	Wakefield	2.27	Milton	0.58
Lexington	28,625	Malden	99	Malden	876	Dedham	4.59	Arlington	2.08	Arlington	0.53
Norwood	28,558	Reading	86	Wakefield	842	Wakefield	4.38	Burlington	1.81	Belmont	0.47
Melrose	27,107	Milton	83	Revere	832	Melrose	3.97	Milton	1.77	Needham	0.47
Needham	26,887	Winchester	83	Norwood	763	Chelsea	3.90	Stoughton	1.73	Wellesley	0.44
Natick	26,798	Norwood	83	Reading	747	Milton	3.82	Melrose	1.57	Framingham	0.43
Wellesley	25,309	Wakefield	82	Dedham	712	Wellesley	3.63	Wellesley	1.57	Lexington	0.42
Milton	24,498	Revere	78	Belmont	708	Burlington	3.44	Canton	1.56	Wakefield	0.42
Wakefield	23,745	Belmont	78	Everett	686	Watertown	3.38	Framingham	1.49	Stoughton	0.33
Belmont	23,686	Westwood	77	Milton	680	Belmont	3.34	Belmont	1.37	Watertown	0.30
Reading	22,262	Dedham	76	Melrose	635	Natick	3.34	Natick	1.33	Canton	0.27
Dedham	22,056	Watertown	75	Winchester	633	Randolph	3.29	Randolph	1.21	Stoneham	0.26
Burlington	21,995	Melrose	74	Westwood	627	Stoneham	3.17	Bedford	1.20	Winchester	0.26
Stoneham	21,664	Bedford	68	Stoughton	621	Stoughton	3.12	Winchester	1.17	Natick	0.25
Winchester	20,789	Stoneham	63	Chelsea	618	Canton	2.97	Watertown	1.01	Randolph	0.24
Winthrop	18,303	Canton	62	Watertown	616	Winchester	2.69	Stoneham	0.97	Burlington	0.21
Stoughton	17,375	Stoughton	60	Walpole	577	Bedford	2.64	Reading	0.85	Walpole	0.20
Canton	16,620	Everett	57	Canton	567	Reading	2.53	Chelsea	0.80	Winthrop	0.19
Walpole	14,607	Walpole	56	Bedford	552	Winthrop	2.03	Walpole	0.80	Bedford	0.18
Westwood	12,282	Ashland	43	Stoneham	517	Walpole	1.92	Winthrop	0.73	Reading	0.18
Bedford	11,084	Chelsea	41	Ashland	390	Wilmington	1.62	Westwood	0.71	Hingham	0.17
Ashland	9,685	Winthrop	36	Holbrook	312	Westwood	1.61	Wilmington	0.67	Westwood	0.16
Holbrook	8,326	Hingham	31	Winthrop	309	Hingham	1.23	Hingham	0.63	Ashland	0.08
Hingham	6,124	Holbrook	31	Hingham	270	Ashland	1.02	Ashland	0.33	Holbrook	0.05
Wilmington	3,632	Wilmington	19	Wilmington	259	Holbrook	0.83	Holbrook	0.28	Wilmington	0.05
Average	46,547	Average	118	Average	1,288	Average	7.46	Average	2.84	Average	0.96
Total	2,001,517	Total	5,076	Total	55,398	Total	320.98	Total	122.32	Total	41.49

2002 Final Community Wastewater Flow Component Estimates (Ranked)

Community	Average Sanitary Flow (MGD)	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.
BWSC	55.00	Malden	10,251	Malden	5,788	Malden	4,772	Somerville	1,385	Cambridge	20,197	Wilmington	248
Cambridge	8.36	Medford	9,053	Medford	5,092	Brookline	3,982	Chelsea	1,343	Chelsea	20,063	Woburn	115
Newton	6.66	Brookline	8,651	Everett	5,000	Everett	3,936	Revere	1,310	Somerville	19,641	Bedford	113
Quincy	5.46	Everett	8,542	Brookline	4,853	Medford	3,921	Cambridge	1,293	BWSC	18,641	BWSC	99
Somerville	4.66	Revere	8,498	Norwood	4,666	Waltham	3,755	Medford	1,171	Revere	13,974	Stoneham	90
Waltham	4.40	Waltham	7,766	Revere	4,531	Norwood	3,591	Melrose	1,118	Everett	12,707	Lexington	86
Framingham	4.37	Cambridge	7,666	Waltham	4,352	Dedham	3,413	BWSC	1,117	Medford	10,156	Cambridge	83
Woburn	4.19	Norwood	7,090	Dedham	4,340	Quincy	3,292	Norwood	1,075	Norwood	9,902	Newton	81
Brookline	4.13	BWSC	6,922	Cambridge	4,100	Revere	3,221	Everett	1,064	Melrose	9,653	Waltham	74
Malden	3.90	Quincy	6,779	Quincy	3,988	Braintree	3,177	Malden	1,016	Brookline	9,358	Brookline	73
Medford	3.89	Winthrop	6,570	Braintree	3,704	Cambridge	2,807	Dedham	927	Malden	8,963	Wakefield	71
Revere	3.30	Dedham	6,447	Melrose	3,591	Stoughton	2,786	Brookline	872	Dedham	8,642	Framingham	70
Weymouth	3.18	Chelsea	6,311	Milton	3,456	Canton	2,751	Milton	853	Milton	6,986	Hingham	70
Arlington	2.61	Woburn	6,260	Stoughton	3,317	Wakefield	2,696	Quincy	695	Quincy	6,733	Revere	70
Lexington	2.46	Wilmington	6,255	Woburn	3,252	Woburn	2,606	Belmont	664	Woburn	6,382	Medford	70
Everett	2.42	Melrose	6,252	Canton	3,228	Milton	2,603	Woburn	646	Belmont	6,057	Malden	69
Braintree	2.29	Somerville	6,225	Wakefield	3,195	Wilmington	2,587	Hingham	630	Waltham	5,575	Canton	69
Chelsea	2.28	Stoneham	6,132	Somerville	3,165	Melrose	2,472	Winthrop	615	Stoughton	5,537	Dedham	68
Watertown	2.07	Arlington	5,826	BWSC	3,000	Winthrop	2,362	Waltham	597	Hingham	5,484	Braintree	68
Stoneham	1.94	Milton	5,618	Winthrop	2,977	Hingham	2,333	Arlington	592	Winthrop	5,319	Reading	67
Norwood	1.85	Braintree	5,588	Hingham	2,963	Newton	2,330	Stoughton	531	Wakefield	5,106	Needham	67
Randolph	1.84	Watertown	5,487	Arlington	2,913	Arlington	2,321	Braintree	527	Arlington	4,989	Natick	66
Needham	1.80	Newton	5,432	Newton	2,850	Needham	2,214	Newton	520	Newton	4,945	Chelsea	65
Natick	1.76	Canton	5,238	Wilmington	2,780	Bedford	2,174	Stoneham	503	Braintree	4,827	Norwood	65
Melrose	1.69	Wakefield	5,202	Needham	2,651	Belmont	1,935	Wakefield	499	Canton	4,357	Burlington	65
Wakefield	1.69	Stoughton	5,024	Chelsea	2,638	BWSC	1,883	Watertown	487	Stoneham	4,127	Wellesley	64
Wellesley	1.62	Bedford	4,783	Belmont	2,599	Stoneham	1,876	Canton	476	Needham	4,084	Everett	64
Belmont	1.50	Bedford	4,718	Bedford	2,500	Winchester	1,848	Needham	437	Watertown	3,997	Belmont	63
Dedham	1.50	Hingham	4,556	Stoneham	2,379	Weymouth	1,813	Winchester	411	Walpole	3,571	Watertown	63
Reading	1.50	Needham	4,326	Winchester	2,259	Somerville	1,779	Walpole	347	Wellesley	3,385	Weymouth	63
Milton	1.47	Winchester	4,250	Watertown	2,127	Burlington	1,737	Wellesley	346	Winchester	3,133	Melrose	62
Burlington	1.42	Lexington	3,625	Weymouth	2,126	Lexington	1,688	Bedford	326	Weymouth	2,983	Walpole	62
Winchester	1.26	Weymouth	3,526	Lexington	1,970	Watertown	1,640	Weymouth	313	Lexington	2,780	Quincy	62
Bedford	1.25	Natick	3,501	Burlington	1,939	Natick	1,394	Lexington	282	Bedford	2,647	Ashland	62
Canton	1.14	Reading	3,387	Walpole	1,733	Walpole	1,386	Natick	262	Wilmington	2,647	Arlington	62
Winthrop	1.10	Walpole	3,328	Natick	1,656	Chelsea	1,294	Westwood	255	Randolph	2,376	Westwood	61
Stoughton	1.06	Burlington	3,301	Wellesley	1,581	Wellesley	1,235	Reading	241	Natick	2,337	Stoughton	61
Walpole	0.91	Randolph	2,891	Westwood	1,388	Reading	1,138	Randolph	211	Reading	2,094	Winchester	61
Wilmington	0.90	Wellesley	2,856	Reading	1,379	Westwood	1,132	Ashland	205	Westwood	2,078	Somerville	60
Westwood	0.75	Holbrook	2,660	Randolph	1,274	Randolph	1,063	Burlington	202	Ashland	1,865	Winthrop	60
Ashland	0.60	Ashland	2,615	Holbrook	1,058	Holbrook	897	Wilmington	193	Burlington	1,826	Holbrook	60
Holbrook	0.50	Westwood	2,568	Ashland	1,051	Ashland	846	Framingham	171	Holbrook	1,613	Milton	60
Hingham	0.43	Framingham	2,497	Framingham	762	Framingham	592	Holbrook	160	Framingham	1,564	Randolph	60
Average	3.65	Average	5,453	Average	2,934	Average	2,309	Average	625	Average	6,588	Average	74
Total	157.11	Total	234,470	Total	126,168	Total	99,282	Total	26,886	Total	283,301	Total	3,191