



**Massachusetts Water Resources Authority**  
Five-Year Strategic Business Plan  
FY 2016–2020





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## Dear Reader,

The Massachusetts's Water Resources Authority's (MWRA) Five Year Strategic Business Plan for fiscal years (FY) 2016-2020 provides a management tool for identifying and prioritizing the strategic initiatives critical to MWRA's mission. It ensures staff are all working toward the same goals and objectives in an ever-changing environment while allowing staff to track progress and identify new issues as they arise. It also provides transparency for our ratepayers and helps to ensure that these initiatives are carried out within the annual capital budget spending limits adopted by the MWRA Board of Directors.

MWRA was established 30 years ago to operate and modernize the failing water and wastewater systems serving approximately 2.5 million people as a wholesaler to 61 cities and towns in eastern Massachusetts. The water and wastewater systems have a combined asset replacement value of approximately \$13 billion. While the systems have been significantly upgraded and rehabilitated over the past 30 years, work remains to be done to complete system upgrades and to ensure that facilities are properly maintained on an ongoing basis. This will enable MWRA to meet changing conditions, such as new regulatory requirements and the effects of climate change.

This Business Plan articulates MWRA's goals and initiatives, grouping them by the following strategic priorities:

- I. Drinking Water Quality and System Performance
- II. Wastewater Management and System Performance
- III. Infrastructure Management and Resilience
- IV. Finance and Management
- V. Environmental Sustainability.

Links throughout this document provide additional context and more detailed information on specific projects, ongoing reporting on routine maintenance initiatives, information on capital budgets and master planning efforts, and compliance with regulatory requirements. These links, provided as numbered hyper-links in the text, are also listed in the back of the document.

MWRA's partnership with the cities and towns within our service area is critical to ensuring the continued delivery of safe water and the transport of wastewater. MWRA continues to provide financial assistance in the form of grants and loans to assist member communities in maintaining and upgrading their local systems.

Within both the water and wastewater systems, MWRA continues to lead in renewable energy production, energy efficiency and revenue generation opportunities. This work continues through MWRA's ongoing plan to upgrade the combined heat and power systems producing more electricity while maintain the heat requirements of the Deer Island Plant. Other key measures to address environmental sustainability include additional efforts to monitor and protect our assets against sea level rise and storm surges associated with climate change and reasonable expansions to the water system service area to assist new communities with insufficient drinking water resources.

MWRA employs robust financial management policies, procedures, and systems to ensure both accountability and transparency to our ratepayers and cost effective resource management over the long-term. Outside of direct water and wastewater system operations, MWRA is moving forward with new initiatives in information technology to evaluate business processes and enhance opportunities to increase overall efficiency.

The Business Plan provides the framework for MWRA staff to manage and measure progress towards achieving system priorities. We hope that you find this document helpful.

Sincerely,

Frederick A. Laskey  
Executive Director





## **Our Mission**

To provide reliable, cost-effective, high quality water and sewer services that protect public health and maintain customer confidence while being good environmental stewards and supporting a prosperous economy

## **Our Values**

- I. Public Accountability & Transparency**
- II. Cost-Effective Services**
- III. Collaboration With Internal/External Partners**
- IV. System Resilience**
- V. Environmental Stewardship**
- VI. Employee Safety and Training**

## Brief System Overview

MWRA's water system extends from the Quabbin, Ware, and Wachusett watersheds in central Massachusetts to the Boston metropolitan area supplying 200 million gallons per day (MGD) to 51 cities and towns. Assets and facilities include roughly 100 miles of transmission system tunnels and aqueducts, another 284 miles of pipelines, treatment facilities, pump stations, and water storage facilities.

The Metro Boston Service Area's water supply, is treated at the John J. Carroll Water Treatment Plant (JCWTP) in Marlborough, Massachusetts, which uses ozone and ultraviolet light to provide disinfection. The Chicopee Valley Aqueduct service area water supply is treated at the William A. Brutsch Water Treatment Facility in Ware, Mass., which uses chlorine and ultraviolet light to provide disinfection of water.

MWRA's Metropolitan Sewerage Service Area system covers 518 square miles in the greater Boston area and serves 43 communities. MWRA's system includes 274 miles of tunnel and interceptors, remote headworks facilities, pump stations and combined sewer overflow (CSO) storage and treatment facilities. The Deer Island Wastewater Treatment Plant has an average daily flow of 354 million

gallons per day (MGD) with a wet weather capacity of 1,270 MGD. MWRA's pelletizing plant ensures beneficial reuse of the residuals generated at Deer Island. MWRA also operates the Clinton Wastewater Treatment Plant, serving Clinton and Lancaster, MA, which has an average daily flow of 3 MGD and a wet weather capacity of 6 MGD.

Ensuring a safe and reliable source of drinking water to our customers, and wastewater discharges that meet all applicable regulations, drives both capital and current expense budget costs.

## Strategic Business Plan Approach

Five strategic priorities integral to MWRA's mission have been identified for action during 2016-2020. Under each of these priorities, MWRA has identified goals and initiatives to guide action. The Strategic Business Plan allows MWRA to track progress towards meeting the core (routine, on-going) and special (new, one-time or aspirational) initiatives. Core and/or special initiatives are identified for each Business Priority Area.

## Key Strategic Priorities

- I. Drinking Water Quality & System Performance**
- II. Wastewater Management & System Performance**
- III. Infrastructure Management & Resilience**
- IV. Finance & Management**
- V. Environmental Sustainability**





Quabbin Reservoir

# I.

# Drinking Water Quality & System Performance

| <b>Goal</b>   | <b>Initiatives</b>   |
|---|--|
| <p><b>1.</b> Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations.<sup>1</sup></p> | <p><b>Core:</b></p> <ul style="list-style-type: none"><li>A. Optimize operation of water treatment facilities to produce high quality, safe drinking water while maximizing water aesthetics (i.e. taste, clarity, and odor).</li><li>B. Monitor drinking water quality in collaboration with member communities and the Department of Conservation and Recreation (DCR) in order to verify high quality water and provide guidance for operating decisions.</li><li>C. Ensure reliability of data presented in required regulatory compliance reports.</li><li>D. Work cooperatively with DCR and the Watershed Trust to ensure effective and transparent watershed management for water quality protection.<sup>2 3</sup></li><li>E. Operate the reservoir system to optimize both quality and quantity of water available for water supply purposes and to meet statutory and regulatory requirements for downstream releases.</li><li>F. Enhance the safety and security of the water supply and watershed system against accidental or intentional threats and hazards.</li></ul> <p><b>Special Initiatives:</b></p> <ul style="list-style-type: none"><li>A. Identify potential transportation related contaminants to the source water and develop a response to potential contamination from these sources.</li><li>B. Evaluate improved ways to monitor and manage the system to maintain high quality water all the way to the ends of the community systems.</li><li>C. Advocate for responsible and reasonable revised drinking water regulations.</li><li>D. Develop improved data handling, auditing, and reporting functionality.</li></ul> |



| <b>Goal</b>  | <b>Initiatives</b>   |
|--|--|
| <p><b>2.</b> Continue to effectively report and communicate water quality information to our customers and public officials.</p>   | <p><b>Core:</b></p> <ul style="list-style-type: none"><li>A. Distribute the federally required annual water quality report, the Consumer Confidence Report (CCR), to all households. <sup>4</sup></li><li>B. Maintain and improve water quality and public health information on MWRA's web page, <a href="http://www.MWRA.com">www.MWRA.com</a>.</li></ul> <p><b>Special Initiatives:</b></p> <ul style="list-style-type: none"><li>A. Investigate web-based and more real time reporting of data.</li></ul>  |
| <p><b>3.</b> Assist member communities to improve local water distribution systems through ongoing financial, technical and operational support programs to maximize long-term water quality benefits.</p> | <p><b>Core:</b></p> <ul style="list-style-type: none"><li>A. Provide technical and operational support through training, on-call contracts, and targeted assistance, as needed.</li><li>B. Promote and manage MWRA's Local Water System Assistance Program to help facilitate improvements in local community infrastructure. <sup>5</sup></li></ul> <p><b>Special Initiative:</b></p> <ul style="list-style-type: none"><li>A. Coordinate with MWRA's Advisory Board and develop a recommendation for a third phase of the community water financial assistance program for the FY21 to FY30 timeframe consistent with the Water Master Plan.</li></ul> |





MetroWest Water Supply Tunnel





Deer Island Wastewater Treatment Plant

## II.

# Wastewater Management & System Performance

| <b>Goal</b>  | <b>Initiatives</b>  |
|--|---|
| <p><b>4.</b> Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system. <sup>6</sup></p>                | <p><b>Core:</b></p> <ul style="list-style-type: none"><li>A. Continue to carry out the Pretreatment Program to protect receiving water quality, maximize the beneficial reuse of wastewater residuals, and protect workers and MWRA’s wastewater treatment plants. <sup>7 8</sup></li><li>B. Continue to monitor DITP Process Control and quality of treated effluent to optimize plant performance and ensure that all applicable NPDES permit limits continue to be attained. <sup>9</sup></li><li>C. Implement enhanced phosphorus control at the Clinton Wastewater Treatment Plant.</li></ul> <p><b>Special Initiatives:</b></p> <ul style="list-style-type: none"><li>A. Develop a molybdenum control strategy to enable more widespread biosolids reuse.</li></ul>   |
| <p><b>5.</b> Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality.</p> | <p><b>Core:</b></p> <ul style="list-style-type: none"><li>A. Prepare updated Local Limits Studies for Clinton and Deer Island in accordance with EPA guidelines to confirm appropriate discharge limits from industries.</li><li>B. Continue to review all Ambient Monitoring Plan questions and conduct evaluations to ensure they address MWRA needs and public concerns. <sup>10</sup></li><li>C. Continue to closely follow potential permit issues such as the impact of changes in bacterial and nutrient water quality standards, NPDES delegation to MA, stormwater permitting, and endangered species designations.</li></ul> <p><b>Special Initiatives:</b></p> <ul style="list-style-type: none"><li>A. Develop a plan to respond to emerging contaminants as they are identified and frame an approach to respond to the public’s concerns about these constituents.</li><li>B. Review new organic waste treatment technologies as they arise.</li><li>C. Prepare for the Dental Amalgam Rule change.</li></ul> |





| Goal   | Initiatives   |
|--|---|
| <p><b>6.</b> Complete all CSO milestones by 2020 and demonstrate that the CSO Plan meets its performance objectives at all outfalls. Ensure compliance with CSO NPDES permit requirements.</p> | <p><b>Core:</b></p> <ul style="list-style-type: none"> <li>A. Complete implementation of the remaining 3 of the original 35 CSO control projects and attain levels of CSO discharge frequency and annual volume specific to each of the 84 CSO outfalls addressed in the long-term CSO plan by 2020, after which responsibility for each Non-MWRA CSO reverts back to the community that owns and operates it (per the Federal Court Order). <sup>11</sup></li> <li>B. Complete final eligibility reviews and closeout of each completed community-implemented CSO Project.</li> <li>C. Develop scope for the court-ordered CSO verification assessment by FY16 and implement the assessment during the period CY 18-20. This assessment is required to demonstrate, by December 2020, that MWRA has attained the performance objectives in its approved CSO Control Plan.</li> </ul> <p><b>Special Initiatives:</b></p> <ul style="list-style-type: none"> <li>A. Conduct an evaluation of the CSO treatment processes to determine potential opportunities to better meet permit limits.</li> </ul> |
| <p><b>7.</b> Assist member communities to improve their wastewater collection systems through ongoing technical, financial, and operational support programs.</p>                              | <p><b>Core:</b></p> <ul style="list-style-type: none"> <li>A. Provide technical and operational support including TV inspections, field work assistance, or other targeted assistance, as needed.</li> <li>B. Promote and manage MWRA's Inflow/Infiltration Local Financial Assistance Program to facilitate reduced I/I in local community infrastructure. <sup>12</sup></li> </ul>  |





Spot Pond Storage Tank



| Goal   | Initiatives  |
|--|--|
| <p><b>8.</b> Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support service levels. <b>13 14 15 16</b></p> | <p><b>Core:</b></p> <p>A. Continue to ensure proper operations and maintenance of the water and wastewater systems and minimize system downtime by performing:</p> <ul style="list-style-type: none"> <li>• Preventative maintenance</li> <li>• Predictive maintenance</li> <li>• Corrective maintenance on equipment and linear assets, as required</li> <li>• Leak surveys of the water system</li> <li>• Water system valve inspections and exercise</li> <li>• Wastewater pipelines, structures, water storage tanks, and inverted siphons inspections, and cleaning.</li> </ul> <p>B. Inspect, maintain, and improve the dams, dikes, and other facilities constituting the infrastructure of the watershed system through ongoing maintenance and an adequate multi-year capital improvement program in order to ensure system reliability and limit potential flood hazards.</p> <p><b>Special Initiatives:</b></p> <p>A. Continue use of Condition Monitoring for all Water and Wastewater sites. Expand Condition Monitoring techniques to provide earlier indication of asset degradation.</p> <p>B. Conduct an updated benchmarking analysis in order to identify gaps and sustain the goal of maximizing asset protection while potentially identifying new best practices in the industry.</p> <p>C. Update the wastewater metering system and evaluate new technologies to ensure continued accurate flow accounting and to enhance its usefulness for operational and evaluation purposes by adding additional monitoring locations.</p> <p>D. Continue to research and develop Key Performance Indicators (KPI) to compare our performance internally and against the industry.</p> <p>E. Enhance and monitor water pipeline protection to maximize pipeline lifetime.</p> |



| Goal  | Initiatives   |
|---|---|
| <p><b>8.</b> <i>(Continued.)</i></p>  | <p>F. Upgrade MWRA's Authority-wide Computerized Maintenance Management System (MAXIMO) to increase functionality to track assets, improve work flow and augment the use of handheld units to increase productivity.</p> <p>G. Continue to upgrade and improve upon the Supervisory Control and Data Acquisition (SCADA) hardware and software to meet the current industry standard and to address cyber security concerns.</p>  |
| <p><b>9.</b> Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects. <b>17 18</b></p> | <p><b>Core:</b></p> <p>A. Continue to design and implement the rehabilitation projects for various pump stations, headworks, and CSO facilities.</p> <p>B. Develop ongoing program to review, prioritize and accelerate the implementation of interceptor renewal projects.</p> <p><b>Special Initiatives:</b></p> <p>A. Implement feasible recommendations from the North System Hydraulic Study to maximize conveyance of wastewater to the locations of least concern for health and environmental impact.</p> <p>B. Complete DITP valve and piping replacement project including operationally complex North Main Pump Station/Winthrop Terminal valve replacement.</p> |

## Goal

## Initiatives

**10.**

Prepare for catastrophic events that could affect the water and wastewater delivery systems.

### Core:

- A. Continue to improve and incorporate redundancy in the water system to ensure uninterrupted service by developing and implementing plans to eliminate or mitigate single points of failure within MWRA's water transmission and distribution system, including the Northern Intermediate High, the Southern Extra High, and the Metro Tunnel System.
- B. Continue to train staff on various potential emergency scenarios and participate in broader Massachusetts Emergency Management Agency (MEMA) and other training exercises.
- C. Continue to implement a comprehensive security and emergency preparedness program.

### Special Initiative:

- A. Develop and implement an Information Security Plan to increase the resiliency and sustainability of the MWRA's data security practices.
- B. Redesign Cyber Security Network perimeter defense in-depth strategy to mitigate the new and evolving threats by taking advantage of next generation technologies.





Deer Island Wastewater Treatment Plant Staff

| Goal   | Initiatives  |
|--|--|
| <p><b>11.</b>                      Ensure<br/>Financial Sustainability,<br/>Integrity, and Transparency.</p> | <p><b>Core:</b></p> <ul style="list-style-type: none"><li>A. Continue the long-term strategic budgeting practice to ensure predictable and reasonable sewer and water assessments to our member communities.</li><li>B. Manage debt and investment portfolios to maximize savings/returns in compliance with all applicable rules and regulations.</li><li>C. Continue diversification strategy to insulate against overexposure and promote resiliency to changing market conditions.</li><li>D. Maintain a system of internal controls to best protect the organization's resources.</li><li>E. Continue to employ budget and expense control practices to manage expenses.</li><li>F. Identify and pursue optimization in all aspects of MWRA financial operations.</li><li>G. Continue to conduct strategic energy procurements.</li><li>H. Continue to fund the pension fund at the annual required contribution level and to develop strategies to address the growing Other Post-Employment Benefits.</li></ul> |



| Goal   | Initiatives   |
|--|---|
| <p><b>12.</b> Ensure Cost-Effective Operational and Resource Management.</p> | <p><b>Core:</b></p> <ul style="list-style-type: none"> <li>A. Maintain and expand MWRA-wide recycling efforts.</li> </ul> <p><b>Special Initiative:</b></p> <ul style="list-style-type: none"> <li>A. Work with staff MWRA-wide to improve specifications development and documentation.</li> <li>B. Develop, implement, and transition to fully automated, virtually paperless procurement and purchasing system.</li> <li>C. Expand use of electronic platforms for the purchase of all goods and services.</li> </ul>  |
| <p><b>13.</b> Maintain an Excellent Workforce.</p>                           | <p><b>Core:</b></p> <ul style="list-style-type: none"> <li>A. Prioritize Succession Planning in anticipation of critical retirements over the next five years.</li> <li>B. Continue to provide programs and procedures to ensure employee safety.</li> <li>C. Provide effective training necessary for employees to obtain and maintain required licenses and certifications to ensure a highly skilled workforce.</li> <li>D. Continue MWRA's efforts to develop new recruitment and retention strategies to foster diversity, including traditionally underrepresented categories, people with disabilities, and veterans. <sup>19</sup></li> </ul> <p><b>Special Initiatives:</b></p> <ul style="list-style-type: none"> <li>A. Continue to expand on MWRA's in-house Job Shadowing and career development training programs.</li> <li>B. Create programs with a focus on professional and leadership development.</li> <li>C. Upgrade MWRA's employment application system to expedite critical hiring and increase applicant data base.</li> <li>D. Expand intern initiative.</li> </ul> |



## Goal

## Initiatives

**14.**

Leverage  
Information  
Technology to Improve  
Organizational Effectiveness.

### Core:

- A. Deliver Information Technology (IT) services and solutions efficiently and effectively.
- B. Provide Information Technology solutions to streamline work processes while ensuring the security and integrity of MWRA data by leveraging the use of existing or emerging technologies.
- C. Obtain feedback from users on satisfaction levels and desired new services and implement changes accordingly.
- D. Maintain current technology hardware, software, and network infrastructure.
- E. Enhance Information Technology workforce capabilities through new certification and license requirements.

### Special Initiatives:

- A. Implement an Application Improvement Program that will continue MWRA's efforts to update and enhance the myriad applications used by MWRA to improve efficiencies of business processes and effectiveness of staff.
- B. Implement an e-Discovery, Archive and Purge System that will provide an automated and integrated solution for archiving electronic content that will allow the Authority to intelligently store, manage and discover email and all critical business information sources, while providing easy and intuitive access for end users.
- C. Execute a Technology Infrastructure Improvement Program that will assess and implement consolidated and optimized versions of MWRA's core IT infrastructure elements and improve data management practices.
- D. Improve the organization of Information Technology and the oversight processes for selecting and implementing IT solutions throughout the MWRA.
- E. Implement real-time SSO reporting system to provide public information and ensure reporting timeframes meet regulatory requirements.



Charlestown Wind Turbine

| Goal   | Initiatives  |
|--|--|
| <p><b>15.</b> Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA's energy assets. <b>20 21 22</b></p> | <p><b>Core:</b></p> <ul style="list-style-type: none"> <li>A. Continue to conduct energy audits at all facilities and establish regular audit schedules.</li> <li>B. Optimize processes to save energy.</li> <li>C. Incorporate energy efficiency into new construction, rehabilitation projects, and equipment replacement.</li> <li>D. Continue to invest in the production and utilization of cost effective renewable energy at MWRA facilities.</li> <li>E. Continue to reduce greenhouse gas emissions that result from MWRA operations.</li> <li>F. Continue to maximize revenue from generation assets.</li> <li>G. Take full advantage of utility energy efficiency rebate opportunities.</li> </ul> <p><b>Special Initiatives:</b></p> <ul style="list-style-type: none"> <li>A. Incorporate employee education on energy efficiency in MWRA training outlets, e.g. tool box talks and HR training classes.</li> <li>B. Determine technical and economic feasibility of co-digestion at Deer Island Wastewater Treatment Plant to ensure it is compatible with existing MWRA wastewater and sludge treatment processes while producing a significant amount of additional high quality gas for energy production.</li> <li>C. Move forward with the design of new gas turbine technology combined heat and power equipment to take advantage of the higher power and thermal efficiencies of new equipment, maximizing the production of additional electric power for on-site use at Deer Island, as well as cost savings while reducing maintenance spending on aging equipment.</li> <li>D. Investigate the potential energy savings from installing new, larger residuals drying trains at the Pelletizer Plant compared to the operational cost of running them.</li> </ul> |





| Goal   | Initiatives  |
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| <p><b>16.</b> Continue to monitor climate change research and move forward with plans to reduce impacts of projected sea level rise and storm surge events on MWRA infrastructure.</p> | <p><b>Core:</b></p> <ul style="list-style-type: none"> <li>A. Incorporate design modifications into facility renovations and maintenance activities to address sea level rise and storm surge.</li> <li>B. Plan and install flood protection barriers at water and wastewater sites which fall below expected elevations of flood waters under condition of a FEMA 100 year storm plus 2 ½ feet to minimize damage and still provide service.</li> </ul> <p><b>Special Initiative:</b></p> <ul style="list-style-type: none"> <li>A. Work with State and regional organizations and academic institutions to identify how MWRA's existing long-term environmental data sets can be used to help assess and project impacts of climate change.</li> </ul> |
| <p><b>17.</b> Advance reasonable water system expansion.</p>   | <p><b>Core:</b></p> <ul style="list-style-type: none"> <li>A. Continue to provide assistance to communities seeking admission to the MWRA's water system or seeking emergency withdrawals.</li> <li>B. Work with prospective communities to inform them of the benefits of admission.</li> </ul> <p><b>Special Initiatives:</b></p> <ul style="list-style-type: none"> <li>A. Advocate for a more streamlined regulatory review procedure, including expediting the Massachusetts Environmental Policy Act and Interbasin Transfer Act review process.</li> <li>B. Work with MWRA's Advisory Board on legislative initiatives to pursue funding for connection assistance for new communities connecting to the water system.</li> </ul>                 |

| Goal   | Initiatives  |
|--|--|
| <p><b>18.</b> Continue to recognize the environmental, cultural, historical, and recreational importance of the watershed lands, the aqueduct system, and the unique location on Boston Harbor of the Deer Island Treatment Plant and Nut Island Headworks, to the citizens of the Commonwealth.</p> | <p><b>Core:</b></p> <ul style="list-style-type: none"> <li>A. Continue to work cooperatively with DCR and cities and towns to ensure that these lands are available for appropriate public access.</li> <li>B. Continue to work with cities and towns to implement the Public Access Initiative on the Wachusett, Weston, Sudbury, and Cochituate Aqueducts. <sup>23</sup></li> <li>C. Continue to provide public access to Boston Harbor at Deer and Nut Islands, while ensuring appropriate security for MWRA's operations. <sup>24</sup></li> </ul> |

# Glossary

**Ambient Monitoring Plan:** MWRA monitors water quality at the outfall location in Massachusetts Bay where treated sewage, or effluent, is discharged. This sampling program is termed “ambient monitoring”, because sampling is focused on the ambient, or surrounding waters at the outfall, as well as more distant locations. The program is detailed in the Ambient Monitoring Plan which is overseen by state and federal regulators, as well as by the Outfall Monitoring Science Advisory Panel

**Asset Management:** Defined by the EPA as “managing infrastructure capital assets to minimize the total cost of owning and operating them, while delivering the service levels customers desire.”

**Benchmarking:** The process of comparing one’s business processes and performance metrics to industry bests or best practices from other companies. One example of an industry metric MWRA uses to benchmark its performance is the American Water Works Association’s “Distribution Systems Operations and Management Standard”.

**Co-digestion:** For the purpose of MWRA discussions, Co-digestion has been focused on the potential addition of organic food waste to the digesters at DITP to address the state ban on the disposal of commercial and industrial food wastes in landfills by taking advantage of excess digester capacity to increase self-generation.

**Combined Heat and Power:** CHP, also known as cogeneration, is the simultaneous production of electricity and heat from a single fuel source. Fuels can include fuel oil, natural gas or biogas from anaerobic digestion as generated/used by Deer Island

**Combined Sewer Overflow:** Combined sewer systems are sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. Most of the time, combined sewer systems transport all of their wastewater to a sewage treatment plant, where it is treated and then discharged to a water body. During periods of heavy rainfall or snowmelt, however, the wastewater volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant. For this reason, combined sewer systems are designed to overflow occasionally and discharge excess wastewater directly to nearby streams, rivers, or other water bodies, with some treatment.

**Community Confidence Report (CCR):** The Community Confidence Report is MWRA’s annual report on drinking water test results which describes how we treat, test and deliver tap water to the homes and businesses in our service area. The MWRA and local water departments test up to 500 samples each week, and test for over 120 contaminants each year. This report is required under the federal Safe Drinking Water Act.

**Condition Monitoring:** Condition monitoring technologies based on vibration, acoustic ultrasonic, infrared thermography, electrical testing, and oil analysis are used to proactively track and trend equipment operating condition. By closely monitoring equipment health, catastrophic failures can be avoided, *repairs can be made*, and asset life can be extended. Component failure can be approximated, replacement parts ordered and replacements scheduled prior to failure and/or total loss of equipment availability.

**Headworks:** MWRA has four headworks whose function is to screen sand, gravel, and large objects out of the sewage prior to it reaching the sewage treatment plant.

**Inflow and Infiltration:** Inflow is surface water that enters the wastewater system from yard, roof and footing drains, from cross-connections with storm drains, downspouts, and through holes in manhole covers. Inflow occurs as a result of storm events such as rainfall, snowfall, springs or snow melt. Infiltration is groundwater, or groundwater that is influenced by surface or sea water, which enters sewer pipes (interceptors, collectors, manholes (MH), or side sewers) through holes, breaks, joint failures, and other openings.



# Glossary

**Local Limits Study:** Local limits are standards that are set by the local Publicly Owned Treatment Works (POTW) that establish the concentration of pollutants that may be discharged into the sewer system by industry. Local limits supplement, and in some cases, strengthen Federal Standards. As required under the EPA's Pretreatment Regulations, 40 CFR Part 403, POTWs such as the MWRA's Deer Island are required to conduct periodic analysis of the existing local discharge limits to ensure that they are adequate to prevent pollutants from entering the treatment system that will interfere with the operation of the treatment plant, degrade the quality of biosolids, or pass untreated through the treatment plant to contaminate the receiving water.

**Local Water Assistance Program:** MWRA's Local Water System Assistance Program (LWSAP) provides interest-free loans to member water communities to perform water system improvement projects. The program's goal is to improve local water system pipeline conditions to help maintain high water quality from MWRA's treatment plant through local pipelines to customers' taps. Community loans will be repaid to MWRA over a 10-year period. Currently, loan funds are approved for distribution from fiscal year 2011 through fiscal year 2020.

**MWRA Advisory Board:** The MWRA Advisory Board was created by the Massachusetts Legislature to represent the interests of MWRA service area communities in the 1984 Enabling Act <sup>25</sup> that established the MWRA. Its members include the chief elected official and a designee from each of the 60 cities and towns, a member of the Metropolitan Area Planning Council, and six gubernatorial appointees representing various interests. The Advisory Board reviews and comments on MWRA capital and current expense budgets, as well as MWRA practices and policies. For more information on the MWRA's Advisory Board <sup>26</sup>

**MWRA Board of Directors:** MWRA is governed by an 11-member Board of Directors who are appointed by the Governor or directly or indirectly by elected officials in MWRA customer communities. The make-up of the MWRA Board of Directors was established in the MWRA enabling act, <sup>27</sup> (Chapter 372 of the Acts of 1984), and amended in August, 2010. <sup>28</sup> For more information on MWRA's Board of Directors. <sup>29</sup>

**NPDES Permit:** The National Pollution Discharge Elimination System Permit Program, administered by the U.S. Environmental Protection Agency, controls water pollution by regulating point sources that discharge pollutants into waters of the United States. All wastewater treatment plants that discharge effluent to Waters of the United States, have an NPDES permit to ensure that their discharges meet all environmental regulatory requirements.

**Orange Notebook:** A quarterly report outlining MWRA's performance on key indicators.

**Predictive Maintenance:** Predictive maintenance are techniques used to determine the condition of assets. Some techniques include vibration, acoustic ultrasonic, ultrasonic thickness and oil analysis. The predictive maintenance results in proactive maintenance activities such as alignments, oil changes or filtering, or balancing rotating equipment that prevent failures and extend equipment life. These predictive maintenance activities are schedules based upon the type of equipment, frequency of use and service conditions.

**Pretreatment Program:** As defined in Federal Regulations 40 CFR 403.3, "pretreatment" means the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. To reduce toxic discharges at their source, MWRA's Toxic Reduction and Control Department administers MWRA's Industrial Pretreatment Program under the Federal Clean Water Act. <sup>30</sup> TRAC regulates industrial dischargers in accordance with its Sewer Rules and Regulations (360 CMR 10.00) <sup>31</sup> and works with industries to encourage voluntary reductions in their toxic chemical use.

# Glossary

**Process Control:** An engineering function (as well as a staff unit) devoted to aiding operations in establishing control limits, monitoring performance and ensuring compliance with treatment plant goals and objectives.

**Reliability Centered Maintenance:** Reliability Centered Maintenance, or RCM, rigorously reviews systems' design, operating context, current maintenance strategies and identifies safety and design improvements. By reviewing systems in their specific operating context, staff's maintenance efforts can be focused where the greatest value is added. Often, the result is a Preventive Maintenance Program that is less costly and more effective in maintaining system availability and long-term asset protection.

**Residuals:** The solids that are left behind after the wastewater has been treated at a wastewater treatment plant, such as MWRA's Deer Island Plant, are called the residuals.

**Supervisory Control and Data Acquisition (SCADA):** These systems provide a means of monitoring and controlling facilities and equipment from a remote, centralized location, as well as providing a continuous record of facility operations.

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<http://www.mwra.com/04water/html/wat.htm>

## **2 Watershed Protection**

<http://www.mwra.state.ma.us/04water/html/watshed.htm>

## **3 Water Supply Protection Trust**

<http://www.mass.gov/eea/agencies/dcr/water-res-protection/watershed-mgmt/water-supply-protection-trust.html>

## **4 Annual Drinking Water Test Results**

<http://www.mwra.com/water/html/awqr.htm>

## **5 Local Water System Assistance Program (LWSAP) For Member Communities**

<http://www.mwra.com/comsupport/lwsap/lwsaprogram.html>

## **6 MWRA's Harbor and Outfall Monitoring 2013 Results**

[http://www.mwra.com/harbor/pdf/outfall\\_overview\\_2013.pdf](http://www.mwra.com/harbor/pdf/outfall_overview_2013.pdf)

## **7 (Discharge) Regulations**

<http://www.mwra.com/03sewer/html/trac.htm#regulations>

## **8 Pretreatment Program and Federal Clean Water Act**

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## **9 NPDES Permit**

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<http://www.mwra.com/transparency/pdf/mwra-affirmativeactionplan-for2015.pdf>

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<http://www.mwra.com/quarterly/orangenotebook/orangenotebook.htm>

**21 MWRA Renewable Energy Program**

<http://www.mwra.state.ma.us/05energy/2011/102611-renewableslides/slides.html>

**22 Energy Staff Summary**

<http://www.mwra.com/05energy/pdf/2012/011812-energystaffsummary.pdf>

**23 Policy on Using MWRA Aqueduct Lands for Trails**

<http://www.mwra.com/projects/access/aqueducts/aqueducts.html>

**24 Deer Island Public Access Area**

[http://www.mwra.com/03sewer/html/sewdi\\_access.htm](http://www.mwra.com/03sewer/html/sewdi_access.htm)

**25 1984 Enabling Act**

<http://archives.lib.state.ma.us/actsResolves/1984/1984acts0372.pdf>

**26 MWRA Advisory Board**

<http://www.mwraadvisoryboard.com/>

**27 1984 Chapter 0372**

<http://archives.lib.state.ma.us/handle/2452/6873>

**28 Acts 2010 Chapter 274**

<http://www.malegislature.gov/Laws/SessionLaws/Acts/2010/Chapter274>

**29 MWRA Board of Directors**

<http://www.mwra.state.ma.us/02org/html/boardofdirectors.htm>

**30 Pretreatment Program and Federal Clean Water Act**

<http://www.mwra.com/03sewer/html/ppnfcwa.htm>

**31 360 CMR 10.000**

<http://www.mwra.com/trac/regulations/2009/360-cmr-10.pdf>





Ultraviolet disinfection units at the John J. Carroll Water Treatment Plant



Massachusetts Water Resources Authority | 100 First Ave. Boston, Massachusetts 02129 | (617) 242-6000

South Boston CSO Pump Station

