



MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
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Boston, MA 02129

Frederick A. Laskey
Executive Director

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WATER POLICY & OVERSIGHT COMMITTEE MEETING

to be held on

Wednesday, September 18, 2019

Chair: B. Peña
Vice-Chair: C. Cook
Committee Members:
J. Carroll
J. Foti
A. Pappastergion
H. Vitale
J. Walsh
J. Wolowicz

Location: 100 First Avenue, 2nd Floor
Charlestown Navy Yard
Boston, MA 02129

Time: 10:00 a.m.

AGENDA

A. Information

1. Update on Quabbin Cemetery (verbal report)

B. Approvals

1. Battery Storage Demonstration Project at Brattle Court Pump Station and Chelsea Facility – Utility Tariff Optimization Service and Site License Agreement: Stem, Inc.

C. Contract Awards

1. Design and Engineering Services During Construction for Quinapoxet Dam Removal: Milone & MacBroom, Inc. Contract 7347
2. Section 56 Replacement Saugus River Crossing, Design and Engineering Services During Construction: AECOM Technical Services, Inc., Contract 7454

D. Contract Amendments/Change Orders

1. Wachusett Aqueduct Pumping Station Design, Construction Administration and Resident Inspection Services: Stantec Consulting Services, Inc., Contract 7156, Amendment 5

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the Water Policy and Oversight Committee July 17, 2019

A meeting of the Water Policy and Oversight Committee was held on July 17, 2019 at the Authority headquarters in Charlestown. Committee Chair Peña presided. Present from the Board were Messrs. Carroll, Cotter, Flanagan, Pappastergion, Vitale and Walsh. Ms. Wolowicz and Messrs. Cook and Foti were absent. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, John Colbert, Corinne Barrett, Jeffrey Bina and Kristin MacDougall. The meeting was called to order at 12:08 p.m.

Contract Awards

* Section 22 Rehabilitation Alternative Analysis and Environmental Permitting: Black & Veatch, Contract 7155

There was brief discussion.

The Committee recommended approval (ref. W A.1).

Contract Amendments/Change Orders

* Bellevue 2 and Turkey Hill Water Tank Painting Project: Worldwide Industries Corp., Contract 7634, Change Order 7


Staff made a presentation. There were questions and answers.

The Committee recommended approval (ref. W B.1).

The meeting adjourned at 12:17 p.m.

* Committee recommendation approved by the Board on July 17, 2019

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: September 18, 2019
SUBJECT: Battery Storage System at the Brattle Court Pumping Station and the Chelsea Facility Utility - Tariff Optimization Service and Site License Agreement Stem, Inc.

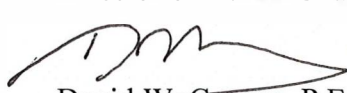
COMMITTEE: Water Policy & Oversight

 INFORMATION

 X VOTE


Michael S. Gillen
Director of Administration

Carolyn M. Fiore, Deputy Chief Operating Officer
Michael E. McDonald, Energy Manager
Denise K. Breiteneicher, Prog. Mgr. Energy and Env. Manager
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

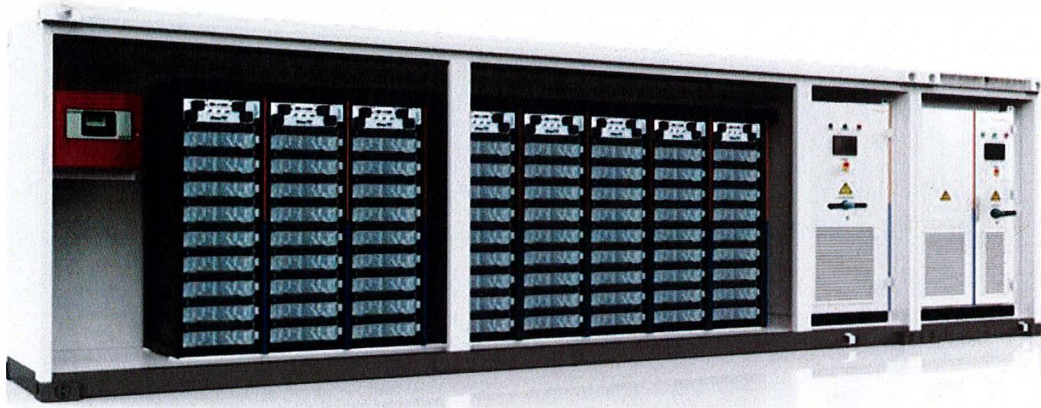
RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to execute a Utility Tariff Optimization Service and Site License Agreement with Stem, Inc. for the operation and maintenance of a battery storage system at the Brattle Court Pumping Station and the Chelsea Facility for an amount not to exceed \$300,100.

DISCUSSION:

The Massachusetts Department of Public Utilities approved the implementation of demand reduction demonstration project offerings and associated budget for Eversource Energy in December 2017. The plan includes four types of demand reduction demonstration projects for the commercial and industrial sector including battery storage, thermal storage, software and controls, and active demand response. Eversource's demonstration project includes data collection intended to provide information regarding projects that can be scaled-up for inclusion in future peak demand reduction programs. Eversource approached MWRA about installing battery storage demonstration projects at facilities with high demand charges. MWRA had expressed interest to Eversource about piloting battery storage previously, in order to reduce high demand costs at certain facilities and to test the use of batteries as a potential tool to increase the resiliency at MWRA's facilities in the future. This project aligns with Governor Baker's Energy Storage Initiative that set a target of 200 MWh's of energy storage to be achieved by January 1, 2020.

The Brattle Court Pumping Station and the Chelsea Facility were chosen as demonstration sites specifically for their high daily electrical demand charges, consistency of demand, and availability of space for the batteries. In FY19, MWRA paid \$198,400 for demand charges at Brattle Court and \$114,200 for demand charges for the Chelsea Facility. The batteries will store energy at night when power is less expensive, and then release it during the daily peak, when costs are the highest. The batteries will be supplied at no cost to MWRA as part of the demonstration program (the approximate cost is \$500,000 per battery) and will be in place for ten years.



The company that will own and operate the batteries and the artificial intelligence that determines when the batteries operate is Stem, Inc. Eversource selected Stem, Inc. through a competitive bid process. MWRA will be required to pay an annual fee for maintenance of the batteries and optimization of the software that instructs the batteries when to operate corresponding with the daily peaks. The table below shows the expected total savings, net savings, and total service fee for both facilities over the life of the ten-year agreement.

Total Demand Savings	Service Fee	Net Savings to MWRA
\$713,500	\$300,100	\$413,400

MWRA will be guaranteed a minimum savings amount annually that would cover the annual maintenance fee. At the end of the ten years, Stem Inc. is required to remove the batteries. Eversource benefits from the demonstration at a water pumping station and office building because the information it collects from this project is replicable at other similar facilities throughout its service area.

The mechanism for contracting with Stem, Inc. for the Eversource battery storage demonstration program is a Utility Tariff Optimization Service and Site License Agreement. MWRA staff will be preparing the sites, including constructing the concrete pads and running the conduits and wires for the batteries. Stem, Inc. will deliver, operate and maintain the batteries throughout the term of the agreement.

BUDGET/FISCAL IMPACT:

Eversource and Stem expect the net savings to the MWRA, after the service fee has been paid, to be approximately \$413,400 total for both facilities over the life of the contract. MWRA will pay about \$30,000 annually for both facilities for maintenance and operation of the battery and the software used to operate the batteries. However, the project has a guaranteed minimum savings of no less than the cost of the maintenance fee for the batteries; therefore, the net savings of the demonstration project will always be positive.

MBE/WBE PARTICIPATION:

There are no MBE/WBE participation requirements established for this contract due to the limited opportunities for subcontracting.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Design and Engineering Services During Construction for Quinapoxet Dam Removal
Milone & MacBroom, Inc.
Contract 7347




COMMITTEE: Water Policy & Oversight

INFORMATION
 VOTE



Michele S. Gillen
Director of Administration

John J. Gregoire, Program Manager, Reservoir Operations
Beth Card, Director, Env. and Regulatory Affairs
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To approve the recommendation of the Consultant Selection Committee to award Contract 7347, Design and Engineering Services During Construction for Quinapoxet Dam Removal, to Milone & MacBroom, Inc., and to authorize the Executive Director, on behalf of the Authority, to execute said contract in an amount not to exceed \$425,442.07 for a contract term of 24 months from the Notice to Proceed.

BACKGROUND:

The Quinapoxet Dam is an earthen embankment and stone masonry horseshoe dam that spans the Quinapoxet River from bank to bank. The Quinapoxet Dam was built in 1905 when the Wachusett Reservoir was constructed as part of an effort to straighten and widen the riverbed to drop sediment before entering the reservoir. The Dam was intended to prevent upcutting of the channel. The dam is owned by the Commonwealth of Massachusetts and is under the care and control of the DCR Division of Water Supply Protection, which is funded by MWRA.



The Department of Fish and Game, Division of Ecological Restoration (DER) has documented naturally reproducing coldwater fishes in the Quinapoxet River and Wachusett Reservoir, and has done analysis on what the potential would be if habitat above the dam were accessible. DER has quantified the habitat available for salmon in the Stillwater (now available) and the Quinapoxet (available after dam removal). Dam removal could increase the salmon population and establish a highly valued fishery.

The Quinapoxet Dam is in need of repair and will require continued maintenance and regulatory inspection into the future for a dam of questionable service to the present-day reservoir. When the reservoir was created, this dam was completed as part of the lower river channel widening and collectively served to mitigate sediment impact on the reservoir. This riverine system has stabilized over the last 115 years. MWRA has modified the reservoir elevation to a stable operating band to eliminate highs and lows in elevation. MWRA also has a sophisticated real-time water quality monitoring system in place. Additionally, removal of obsolete dams are finding favor in the environmental community for the substantial benefits that result.

This dam falls under the jurisdiction of the Massachusetts Office of Dam Safety. It is listed as a Significant Hazard class dam, mainly due to public infrastructure downstream (MWRA's Oakdale power station and the 3-arch bridge on Thomas Street) and the potential for that infrastructure to be adversely impacted should the Quinapoxet Dam fail. A 2007 inspection report included a *Fair* ranking and noted that significant operational and maintenance deficiencies existed which, under unusual loadings (e.g., excessively high Quinapoxet River flows) could further degrade the dam. The estimated capital repair costs are in the range of \$200,000 to \$400,000.

MWRA has the in-house capacity and experience in managing a wide range of consultant and contractor procurements, as well as managing construction and ESDC. DCR does not have this capability and depth of experience. MWRA has set precedent for managing other construction contracts for DCR that were deemed important to the mission of the MWRA/DCR reservoir system.

In addition, MWRA understands the potential environmental benefit associated with reproducing a cold water fishery (i.e., restoring a salmon population formerly impacted by creation of the dam). This project is consistent with the goals of the Executive Office of Energy and Environmental Affairs and the Department of Fish and Game, and it makes sense to support their efforts.

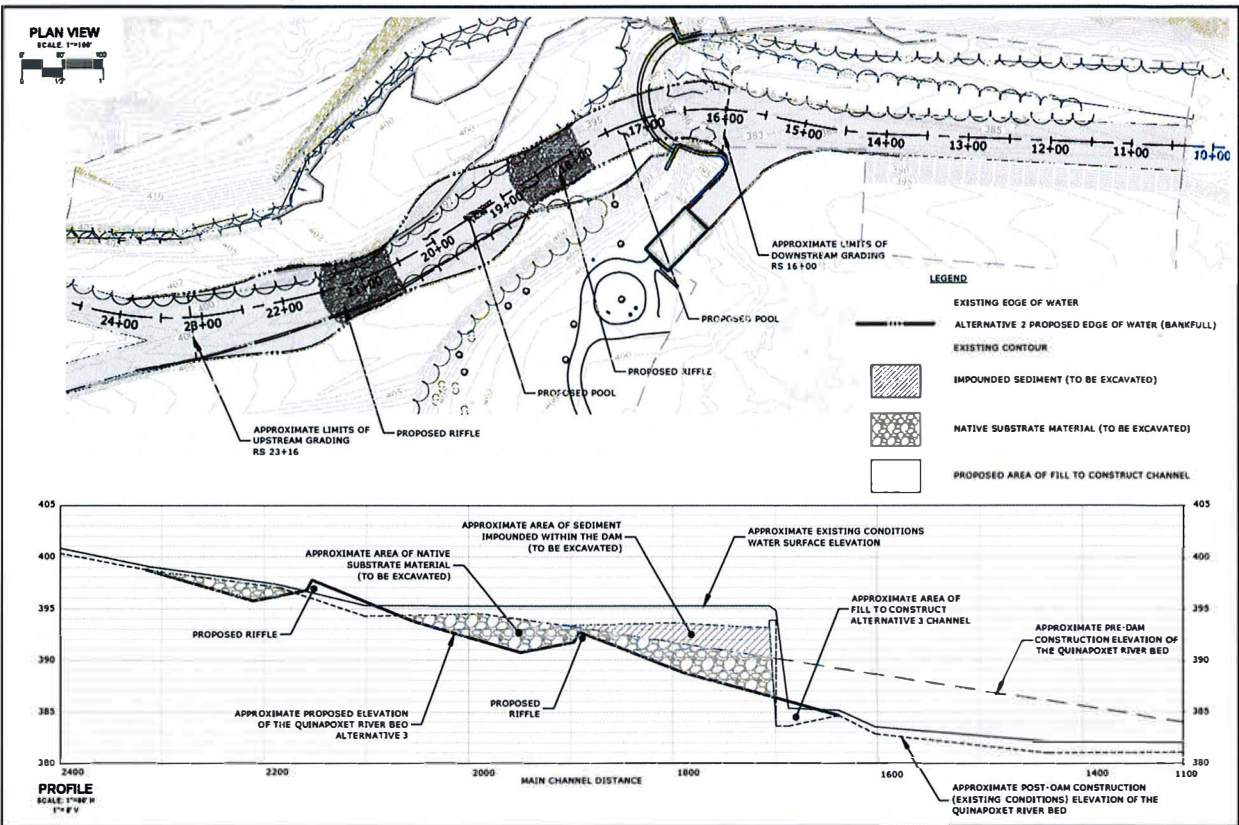
Over the last several years there have been many meetings between MWRA, DCR, and DER to discuss the various elements of removing the Quinapoxet Dam. In 2016, the feasibility of removing the dam was studied by Milone & MacBroom, Inc., under contract to DER, and under the direction of DER, MWRA and DCR. The feasibility study resulted in the identification of three preliminary conceptual designs. At MWRA's request, an additional structural assessment was conducted in 2017 to further inform advancing engineering design. In the meantime, MWRA has secured one grant for \$40,000 and is currently pursuing another grant for \$120,000 to support the design and permitting work. DER is the source of both grants. MWRA staff have developed the Scope of Work for a consultant contract for Design, Bid Support, and Engineering Services During Construction.

The recommendation from the Consultant Selection Committee is to support an award that includes design, permitting and ESDC for the Quinapoxet Dam Removal, which is described in detail below. This procurement does not include construction to remove the dam. At this time, MWRA has not made any commitment to fund the construction, which has been estimated to cost approximately \$1.2 million. MWRA, DCR, and DER intend to seek state and federal construction grants. Given that dam removal is a priority for EEA, environmental groups, and sport fishing associations, strong support for securing such funds is anticipated.

DISCUSSION:

Contract 7347 builds on prior project phases and provides a refinement of the conceptual design that was previously developed. The project will address outstanding structural and constructability questions related to maintaining downstream water quality, to establish engineering design plans to support all required environmental and historic permitting. This will include participating in project management and consultation meetings with MWRA, DER, DCR, and regulatory agencies. An architectural rendering of the final design and anticipated riverine conditions proximal to the dam removal at project completion will also be required.

The project team identified a likely conceptual design option from the 2016 feasibility study to pursue further. This option will see removal of much of the dam, very limited river channel work downstream of the dam, and establishment of a regraded area with riffles and pools to mimic a natural regime for fish passage (image below). Emphasis on this option was included in the RFQ/P and then further highlighted at the pre-bid site visit.



Conceptual Design

Concerns that must be addressed in more detailed design relate to ensuring the structural integrity of proximate MWRA water supply infrastructure during and after construction, and sediment management to ensure water quality can be protected during construction and long-term post dam removal. The design must also consider MWRA operational practices, such as the transfer of water from Quabbin to Wachusett Reservoir. The Quabbin Aqueduct discharge flows are as much as 300 MGD and create an attraction flow for fish, which must be mitigated. These considerations

will have implications for both the design and construction approach.

Procurement Process

On May 1, 2019, MWRA issued a one-step Request for Qualifications Statements/Proposals (RFQ/P) that was publicly advertised in the Central Register, Boston Herald, Banner Publication and El Mundo, with notice sent directly to 29 firms. Thirty-eight firms requested the RFQ/P documents.

The RFQ/P included the following evaluation criteria: Cost – 25 points; Qualifications & Key Personnel – 25 points; Experience, Past Performance on Similar Non-Authority Projects, Past Performance on Authority Projects – 20 points; Technical Approach – 20 points; and Capacity/Organization and Management Approach – 10 points.

A pre-proposal conference and site visit was held on May 23, 2019, and ten firms attended. MWRA received three proposals on July 12, 2019, from GZA GeoEnvironmental, Inc., Milone & MacBroom, and Pare Corporation. The proposed costs and levels of effort by the three firms are as follows:

PROPOSER	PROPOSED CONTRACT COST	LEVEL OF EFFORT
<i>Engineer's Estimate</i>	<i>\$250,000.00</i>	
Milone & MacBroom, Inc.	\$425,442.07	3035.5 hours
Pare Corporation	\$469,790.42	3072.5 hours
GZA, Inc.	\$577,316.57	3898.5 hours

The selection committee reviewed, scored, and ranked the proposals as follows:

PROPOSER	TOTAL POINTS	*ORDER OF PREFERENCE/ TOTAL SCORE	FINAL RANKING
Milone & MacBroom, Inc.	444	6	1
GZA, Inc.	428	9	2
Pare Corporation	309	15	3

*Order of Preference represents the sum of the individual Selection Committee members' rankings where the firm receiving the highest number of points is assigned a "1," the firm receiving the next highest number of points is assigned a "2," and so on.

Milone & MacBroom presented very strong qualifications, experience, past performance, technical approach and capacity. The Milone & MacBroom team will be led by a project manager/sediment specialist with significant, recent experience working on dam rehabilitation and deconstruction efforts in Massachusetts and across the country. The project manager is supported by a highly skilled group of professionals including a structural engineer, permitting specialist, and historic architecture experts all with decades of experience.

Notable in Milone & MacBroom's recent experience and past performance is engineering and design services provided to New York City DEP. This work was done in accordance with the

City's watershed management strategy in order to aid in reducing turbidity in the water supply reservoirs in the Catskills (NYC, like the MWRA, has EPA-mandated filtration avoidance requirements). In addition, Milone & MacBroom's proposed project manager recently completed the design and permitting for the Holmes Dam Removal in Plymouth, MA. This project included many important components, which mirror those in this project. References for work on similar projects were very favorable; NYC-DEP ranked the firm's performance as excellent. Milone & MacBroom's cost is the lowest of the three proposals and includes the highest level of effort of the three firms for the permitting and final design task. Due to complexity of the design and permitting for this work, staff are of the opinion that Milone & MacBroom's estimate appropriately reflects the costs and hours required for this project.

GZA also presented very strong qualifications, experience, and past performance. Its proposal included a thoughtful and comprehensive technical approach that demonstrated a clear understanding of the project. The staff proposed were well qualified with valuable, relevant experience, and the firm's proposal presented multiple examples of highly relevant experience. Internal and external references were very favorable. GZA had the highest cost of the three proposals, primarily due to a high overall level of effort, with GZA's overhead rate as a contributing factor.

Pare did not demonstrate the same understanding of the project as the other firms, and had a heavy reliance on its subcontractor. Pare's costs were the second lowest; however, the level of effort for preliminary design was disproportionately high, while the level of effort for permitting and final design were disproportionately low.

The cost for each proposal was higher than the staff estimate of \$250,000. Having reviewed all three proposals, staff believe that the selected proposal is appropriate for a project of this size and scope. Milone & MacBroom submitted a high quality proposal with an excellent engineering team, excellent technical approach, and proven prior experience conducting designing dam removal and restoration projects, and an appropriate level of effort for this project. Based on final rankings and for the reasons set forth above, the Selection Committee recommends the award of this contract to Milone & MacBroom, in an amount not to exceed \$425,442.07.

BUDGET/FISCAL IMPACT:

The FY20 CIP includes a budget of \$200,000 for contract 7347. The award amount is \$425,442.07, or \$225,442.07 over budget. This amount will be absorbed within the five-year CIP spending cap.

MBE/WBE PARTICIPATION:

There were no MBE or WBE participation requirements established for this contract due to limited opportunities for subcontracting.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Section 56 Replacement Saugus River Crossing, Design and Engineering Services During Construction
AECOM Technical Services, Inc.
Contract 7454



COMMITTEE: Water Policy & Oversight

 INFORMATION

 X VOTE


Michele S. Gillen

Director of Administration


David W. Coppes, P.E.

Chief Operating Officer

John P. Colbert, P.E., Chief Engineer
William G. Sullivan, P.E., Sr. Program Manager
Preparer/Title

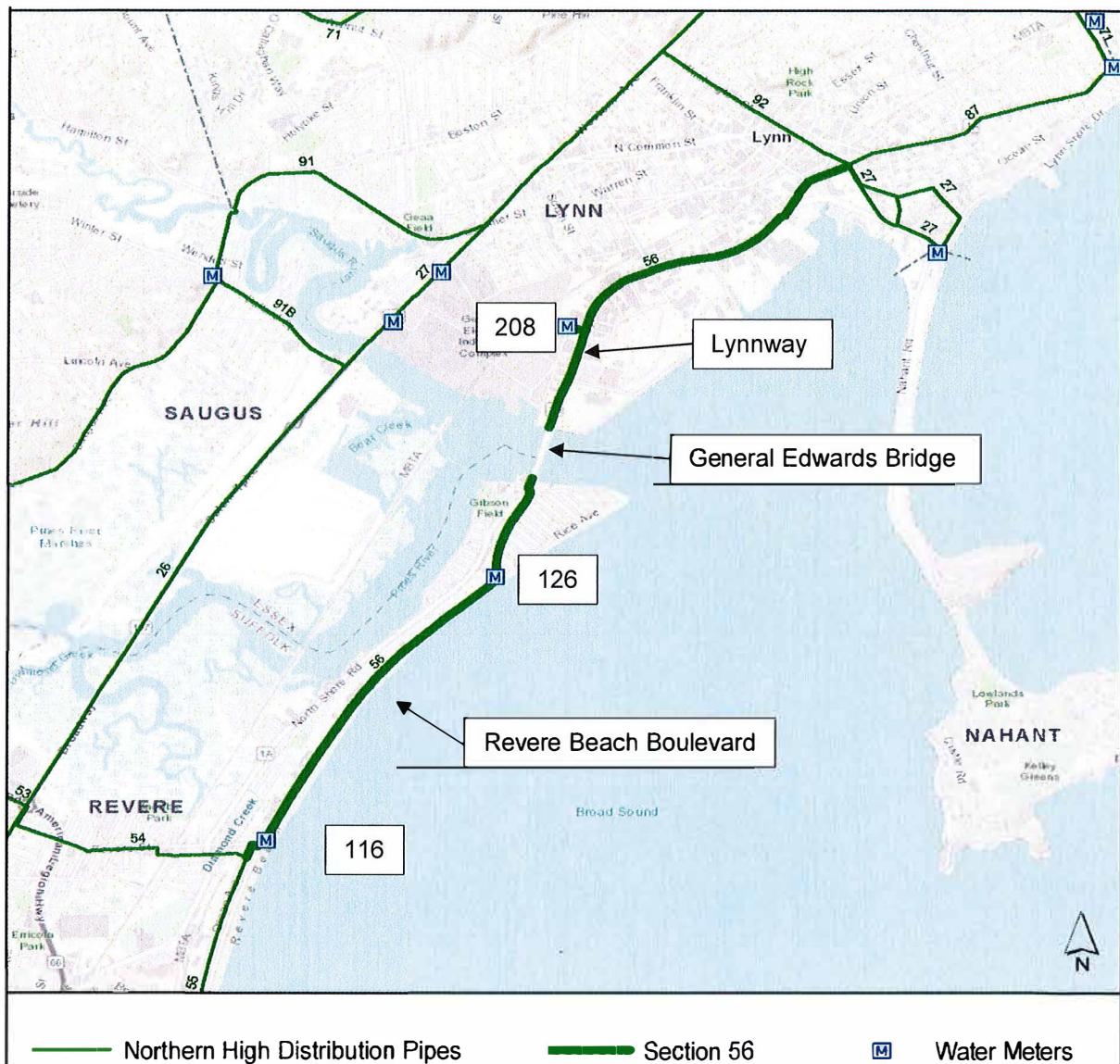
RECOMMENDATION:

To approve the recommendation of the Consultant Selection Committee to award Contract 7454, Section 56 Replacement Saugus River Crossing, Design and Engineering Services During Construction, to AECOM Technical Services, Inc., and to authorize the Executive Director, on behalf of the Authority, to execute said contract in the amount of \$3,345,887 for a contract term of 51 months from the Notice to Proceed.

BACKGROUND:

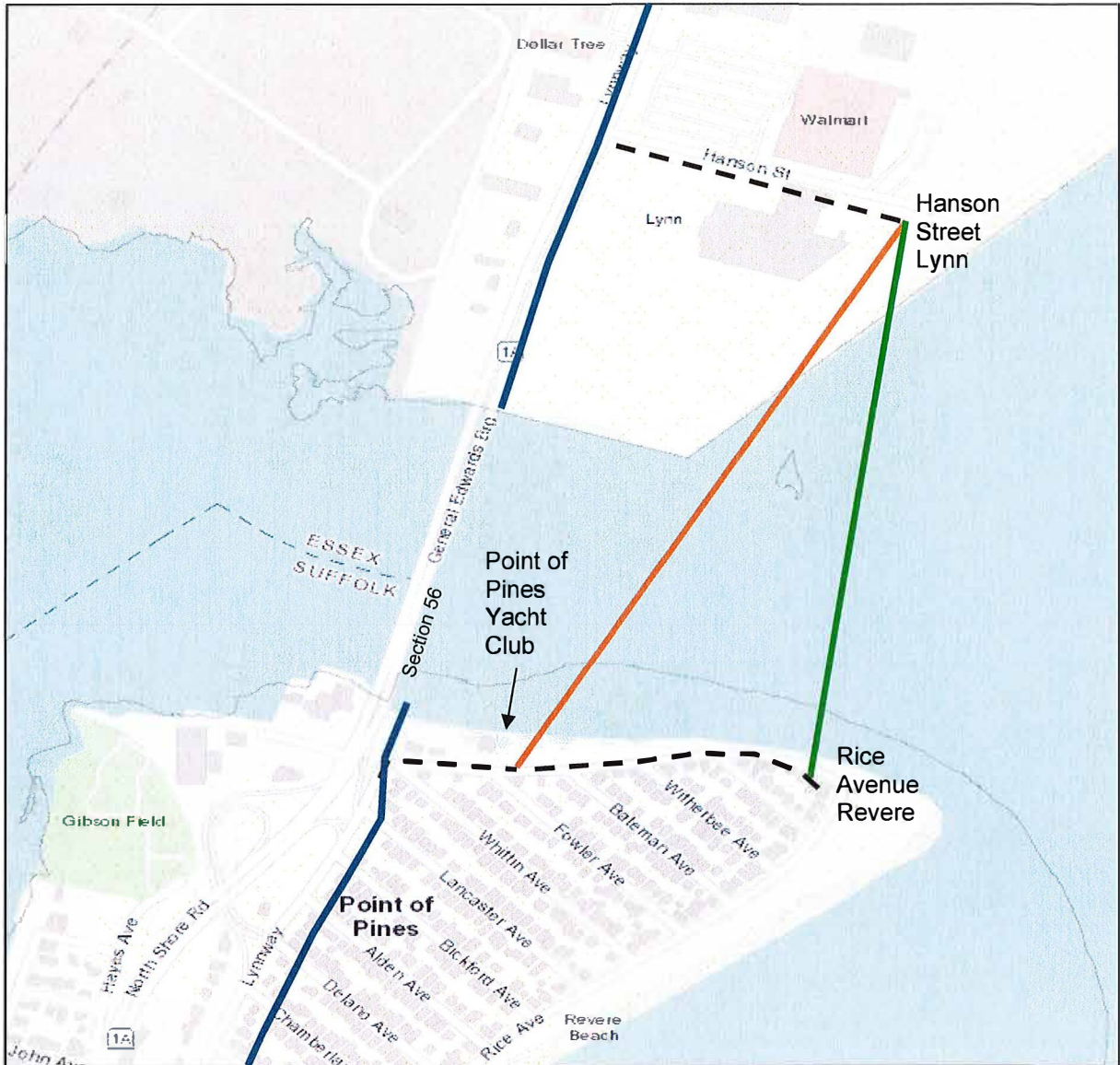
MWRA’s Section 56 water distribution pipe, constructed in 1934, begins on Ocean Avenue in Revere and runs along Revere Street, Revere Beach Boulevard, to the Lynnway in Lynn, and continues along Broad Street to the intersection with Washington Street in Lynn. Section 56 consists of a 20-inch diameter cast iron pipe for most of its length. It previously crossed the Saugus River on the General Edwards Bridge at the Revere/Lynn town line. However, since February 2014, Section 56 has been isolated over the General Edwards Bridge as a result of a significant number of leaks due to severe corrosion from pipe age and environmental conditions. MWRA removed the pipeline from the bridge in 2019 under Contract 7536 due to the pipe supports causing damage to the bridge and splitting of the pipe at multiple locations.

Section 56 is an important pipeline that provides redundancy for the MWRA Northern High Service Zone communities including Revere, Lynn (General Electric Company), Nahant, Swampscott and Marblehead. See Section 56 and meter locations on the next page.



A Feasibility Study for replacement of the crossing of the Saugus River was completed in 2017. This study evaluated installation methods and route alternatives, including replacement in place and submerged river crossings using traditional open-cut and trenchless technologies. In total, eight potential replacement route alignments and four installation methods were evaluated.

The study recommended that two horizontal directional drilling alternatives be carried forward into preliminary design. Both routes share a drill entry on Hanson Street in Lynn. One route has a drill exit near the end of the Point of Pines on Rice Avenue, and the other route has a drill exit near the Point of Pines Yacht Club. Risks associated with seawall obstruction, easements/land acquisitions, and abutter concerns must be fully evaluated during preliminary design through site reconnaissance, investigation of potential obstructions, and the subsurface exploration program. Both routes would require land access/acquisition agreements and/or easements to provide for construction access and for the permanent pipeline. The figure on the next page shows the two alternative routes.



Horizontal Directional Drilling Routes ———— ————
 Cut and Cover Pipeline Routes - - - - -

DISCUSSION:

The Project includes design and engineering services during construction of the Section 56 crossing of the Saugus River in Revere and Lynn. Preliminary design includes field and utility survey, and base plan mapping; real estate plans for land acquisition and easements; permitting, including preparation of an Environmental Notification Form and an allowance for an Environmental Impact Report; environmental, and traffic assessments; geotechnical and hazardous materials investigations; a corrosion program; development of a preliminary design report; and preparation of permit applications. The final design includes the preparation of contract plans, specifications, construction cost estimates, and bidding assistance.

Engineering Services During Construction (ESDC) includes administration, reviews of submittals and requests for information; and assistance with change orders, start-up services and record drawings. ESDC services will be provided during construction of the project through completion, final acceptance, and the one-year warranty period. Resident Engineering/Inspection services are not included in this contract, but will be procured separately at a later date.

Procurement Process

On June 15, 2019, MWRA issued a one-step Request for Qualifications Statements/Proposals (RFQ/P) that was publicly advertised in the Central Register, Boston Herald, Banner Publication and El Mundo; and directly solicited firms by email. Twenty-six firms requested copies of the RFQ/P. The RFQ/P included the following evaluation criteria and points: Cost (25 points); Qualifications and Key Personnel (25 points); Experience/Past Performance on Similar Non-Authority Projects and Past Performance on Authority Projects (20 points); Technical Approach (15 points); Capacity/Organization and Management Approach (10 points) points; and Minority and Women-Owned Business Enterprise participation (5 points).

On August 8, 2019, MWRA received proposals from the following two firms: AECOM Technical Services, Inc. and Weston & Sampson Engineers, Inc. Procurement staff contacted the other firms who requested the RFQ/P; three firms were proposed as subconsultants on either AECOM’s or Weston & Sampson’s team; others indicated they made a business decision to pursue another upcoming MWRA project (Section 53); and others indicated they did not have the resources or expertise to successfully perform the work. The following table represents the cost and level of effort proposed by each firm:

Proposer	Proposed Cost	Proposed Hours
<i>Engineer’s Estimate</i>	<i>\$2,732,900</i>	<i>15,686</i>
AECOM Technical Services, Inc.	\$3,345,887*	17,996
Weston & Sampson Engineers, Inc.	\$3,763,863*	21,259

*Reflects corrections due to math errors

The Selection Committee met on August 21, 2019 to evaluate and rank the proposals. The results are presented below.

Proposer	Total Final Score	Order of Preference* Points	Ranking
AECOM Technical Services, Inc.	393.5	6	1
Weston & Sampson Engineers, Inc.	337.75	9	2

*Order of Preference represents the sum of individual Selection Committee members’ rankings where the firm receiving the highest number of points is assigned a “1”; the firm receiving the next highest number of points is assigned a “2”, and so on.

AECOM’s proposed hours were approximately 15% higher than the engineer’s estimate and 15% lower than the hours of the second-ranked Weston & Sampson. Upon review, staff attribute the difference between the engineer’s estimate and AECOM’s hours to underestimation of project

management, geotechnical investigation and preliminary design. Correcting for these variances, and considering the greater number of hours proposed by AECOM, the Consultant Selection Committee considered the overall cost presented by AECOM to be reasonable.

AECOM's proposal included highly qualified personnel who have extensive and relevant experience in geotechnical investigations, pipeline design, horizontal directional drilling, permitting and construction support. AECOM has the in-house depth of resources and breadth of experience to perform all facets of the work with only minor support from its subconsultants, which will facilitate better project management and communications.

AECOM provided extensive documentation of its experience and past performance on horizontal directional drilling projects of similar diameter, length and complexity. In addition to positive references for its performance on similar out of state projects, the firm successfully managed several pipeline projects for MWRA including the Mill Cove Relief Siphon (2,000-foot, 42-inch by horizontal directional drilling) and the Fore River Siphon (two 3,900-foot pipes in 42-inch diameter casings by horizontal directional drilling). Selection Committee members determined that AECOM proposed a highly qualified team with relevant past experience of similar scope and magnitude. AECOM also demonstrated a full understanding of the project requirements in its Technical Approach, clearly presented, and has the capacity, organization and management approach necessary to successfully complete the project.

The Selection Committee concluded that the Weston & Sampson team, while capable of performing the work, have less experience than the AECOM team, listed less relevant projects except those performed by its subconsultant, and its cost was less competitive.

Staff met with AECOM's representatives on August 28, 2019 to better understand how AECOM developed its proposal and associated costs, and to get a clearer understanding of the cost assumptions and rationale. Staff concluded that AECOM understands the nature and extent of the work and its overall cost is reasonable.

Based on the voting of the Selection Committee and subsequent discussions with AECOM, staff recommend the award of this contract to AECOM Technical Services, Inc. in the amount of \$3,345,887.

BUDGET/FISCAL IMPACT:

The FY20 Capital Improvement Program includes a budget of \$1,536,995 for Contract 7454; the recommended contract amount is \$3,345,887 or \$1,808,892 over budget. This amount will be covered within the five-year CIP spending cap.

MBE/WBE PARTICIPATION:

The MBE and WBE participation requirements for this contract were established at 7.18% and 5.77% respectively. AECOM requested a partial waiver of the MBE participation requirement, which was granted, committing to 4.94% MBE and 10.85% WBE participation.

STAFF SUMMARY


TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Wachusett Aqueduct Pumping Station Design, Construction Administration and Resident Inspection Services
Stantec Consulting Services, Inc.
Contract 7156, Amendment 5



COMMITTEE: Water Policy & Oversight

INFORMATION
 VOTE

John P. Colbert, P.E., Chief Engineer
William G. Sullivan, P.E., Sr. Program Manager
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

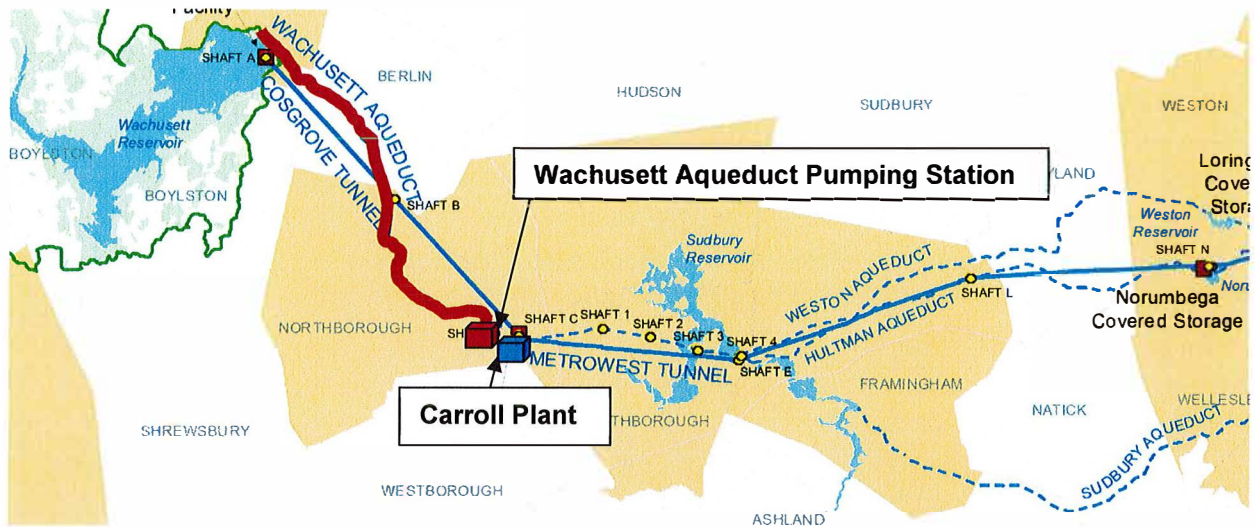
To authorize the Executive Director, on behalf of the Authority, to approve Amendment 5 to Contract 7156, Wachusett Aqueduct Pumping Station Design, Construction Administration and Resident Inspection Services with Stantec Consulting Services, Inc., in the net amount of \$502,340.69, increasing the contract amount from \$7,603,600.10 to an amount not to exceed \$8,105,940.79 with no change in the contract term.

DISCUSSION:

On January 18, 2012, the Board approved the award of Contract 7156 to Fay, Spofford and Thorndike, LLC. Subsequently, Fay, Spofford and Thorndike, LLC was acquired by Stantec Consulting Services, Inc., and on February 10, 2016 the Board approved the assignment of this contract to Stantec.

This contract is part of the MWRA's long-term redundancy plan for the water transmission system. The pumping station, located adjacent to the John J. Carroll Water Treatment Plant in Marlborough (see location map and photo on the following page), addressed a major weakness in redundancy from the Wachusett Reservoir to the Carroll Treatment Plant in Marlborough.

Construction is substantially complete. All testing has been completed and the facility is performing as designed. The pumping station is currently available to supply the Carroll Plant in an emergency.



Location Plan – Wachusett Aqueduct Pumping Station



Wachusett Aqueduct Pumping Station

This Amendment

As more fully described below, if approved this Amendment will (i) provide for additional funds for engineering services not included in Stantec's original contract, including design changes, instrumentation programming and testing support; and (ii) authorize settlement of claims by the Authority for cost recovery related to certain design errors.

(i) Additional Engineering Services **\$823,504.69**

Out of Scope Design Changes:

Armoring of the North Bank of the Forebay \$49,846.00

The Forebay is an open channel approximately 60 feet wide and 2,400 feet long that passes in front of the pumping station. The Authority directed Stantec to investigate if there was potential for erosion on the north bank of the Forebay as a result of overflows from the Inlet/Overflow Channel of the pumping station. Stantec developed a computational fluid dynamics model for the Forebay and the discharge of the inlet/overflow apron. Stantec assessed the existing soil conditions along the bank and the bottom of the Forebay. Stantec prepared a design for the armoring of the north bank and the bottom of the Forebay with stone riprap. Stantec also prepared supporting drawings for modification of the existing environmental permits with the Marlborough Conservation Commission, MassDEP and the U.S. Army Corp of Engineers.

Surge Tank Overflow Channel Redesign \$23,797.31

The purpose of the pumping station surge tank is to release the high pressure surge wave that results from an uncontrolled shutdown of the pumps. The riprap channel that carries overflows from the surge tank to the Forebay was designed to gradually release the overflow that results from the surge wave created by a trip of the pumping station as will occur during a power failure. During facility testing it was determined that pumping monthly maintenance flows to the surge tank overflow was preferable to pumping these flows to the Carroll Plant to prevent impacts on water quality. Passing the higher maintenance test flows of up to 30 million gallons per day required redesign of the channel to be significantly wider in order to contain these high flows.

Solar Panel Change \$19,270.56

The output efficiency of solar panels increased after the design for the system was completed and specifications prepared. The original design included solar panels with a maximum output of 255 watts. However, current panels of the same size are capable of an output of 300 watts. A cost benefit analysis of the proposed upgrade was conducted and found to be worthwhile. Implementation of the greater output required modifications to the electrical system design.

Hultman Bypass End Connection and Plug Redesign \$17,097.83

The project includes a bypass of the Forebay Channel weir in order to lower the water level in the Forebay so that the maximum pumping station flow of 240 million gallons per day can be achieved.

Redesign of the Hultman Bypass end connections was found to be required. When the Contractor excavated the connection at the existing Hultman Intake building, the location of the pipe exiting the structure was not as shown on the record drawings for the structure. The bypass is constructed of precast box culverts in the middle sections and cast-in-place concrete at the ends. The cast-in-place concrete creates the closure between the box culvert and the discharge wing walls. The design for the wall sections of the closure pieces required modification to shorten the wall sections so that they would fit the precast box culverts. Stantec performed structural calculations, and developed revised drawings for the wing walls.

Air/Vacuum Valves Drains \$15,475.82

The Authority directed Stantec to design drains for the seven air/vacuum valves installed after the pump control valves. These valves release some water during the surge wave that results during a power failure. The work included calculation of the pressure wave at the air/vacuum valves, sizing of the discharge piping, development of pipe restraints, design of the pipe route through the pump room floor to the pipe gallery in the basement below, review of architectural codes for clearances and safe passage, and development of a cost estimate.

Front Gate Changes \$14,584.96

During the construction of the new Carroll Plant front entrance, a number of changes were implemented to improve safety and security including installing an illuminated stop sign; adding painted directional arrows; changing the cameras used at the front gate to a different model; revising the stop line locations; and adding a warning device for the end of the horizontal gates. Modifications were also required to the high security horizontal swing gates that the Authority purchased previously. Stantec expended additional staff time on repair of the gate controls and designing a safety loop.

Surge Tank Pipe Connection Redesign \$7,578.23

The connection of the surge tank to the existing 120-inch pipe that runs up to the Carroll Plant required redesign due to incorrect pipe installation by the Contractor. The pipe connection alignments were installed off-center horizontally and vertically. The redesign included the design of a steel plate, stiffeners and concrete encasement. Stantec prepared structural and hydraulic calculations and issued details and elevation plans.

Development of Pipe Flushing Procedures \$4,749.15

During pump testing, an increase in turbidity at the plant required aqueduct and pipe system flushing before the pumps could be turned on. Stantec calculated flushing requirements and developed procedures to flush this pipe prior to each pump station startup.

Other Miscellaneous Design Changes \$45,350.98

Additional out of scope work was completed by Stantec including: redesigning the slide gate cover plate details due to variations in the curb height and the slide gate frames as installed by the

Contractor; reviewing the duct bank medium voltage cable installation and checking calculations to confirm the design; revising design details to allow for corrective work on misaligned columns in the pump station; and redesigning the pump surge control valve panel wiring to provide for a more linear change in flow through the flow control valve to stabilize changes in flow into the Carroll Plant.

Other Additional Work Furnished:

Instrumentation and Controls

\$180,701.10

Additional instrument and controls work was required due to equipment obsolescence, additional meetings and new SCADA standards. The effect of these changes required Stantec to expend an additional level of effort, and therefore more budget, than provided in the original contract.

New, larger Ozone Destruct Units were installed in the Carroll Plant to accommodate the change in operating conditions resulting from water supply to the plant from the new pumping station. The original design intent was to install the existing program into the new Ozone Destruct Unit controllers. However, the existing Carroll Plant Ozone Destruct Unit processor was obsolete and required replacement. The new processor requires a different programming structure which precludes the reuse of the old program. Stantec was required to write a new program for the Ozone Destruct Units.

The contract Scope of Work specified the number of meetings to be attended for the project instrumentation system. Resolving the problems with the pumping station instrumentation and the startup of the Ozone Destruct Units required more meetings than contained in the contract.

Stantec completed the base programming for the Wachusett Aqueduct Pumping Station in September 2017. The programming was factory tested the same month. The Authority subsequently adopted high performance graphics and screens in 2018 that required Stantec to revise and retest the applications developed. Additional screens and control graphics were required that were not anticipated in the original scope.

Change Order and Dispute Assistance

\$171,350.33

The construction contractor submitted 255 change order requests on which Stantec reviewed and made recommendations. Stantec developed fair cost estimates for the larger cost change orders and assisted in negotiations with the contractor. The change order review work was above what was expected in the contract and resulted in additional hours to complete the associated work.

In addition to the change orders, Stantec assisted the Authority with evaluating contractor claims. A differing site conditions claim for excavation support was extremely complex as over 300 pages of supporting documentation was submitted by the contractor and required significant time and effort to review. Stantec researched daily field reports, contractor requests for information, prior geotechnical investigations and records of site inspections. The claim was evaluated by Stantec's senior geotechnical and structural engineers. Stantec's geotechnical subconsultant prepared a

technical memorandum with an opinion on the technical validity of the claim.

Construction Administration

\$152,940.18

Increased construction effort and hours were required by Stantec staff and its subconsultants to support the additional amendment work activities identified in this staff summary, including the startup testing and SCADA checkout work which took several months and required significant coordination. The added work included additional communications and meetings with Authority staff, Stantec's subconsultants and the construction contractor, amending subconsultant agreements, and adjusting invoices and financial summaries for the additional work activities.

Overview Training, Testing and Start-Up Services

\$67,712.27

The original scope of work and budget were based on a two phased facility startup: individual pump start-up, followed by whole system start-up, both of which would be completed in one week. The actual duration of testing required seven weeks to complete due to problems with turbidity, pump vibration, emergency generator tripping, surge control valve problems, pump faulting and motor control center programming failures. This resulted in significantly more work for Stantec to respond to issues and staff the start-up period.

Stantec's original scope of work included operator training based on the Standard Operating Procedures developed for the pumping station at the completion of testing. Stantec also prepared interim overview training and procedures that were not in the original scope of services to support the five days of Reliability Testing with a new SCADA system.

Air Handling Unit Vibration

\$26,139.57

The discharge ducts at the building ventilation air handling units shake when they are in operation. Stantec investigated the problem to identify the cause and developed recommendations for resolution. The shape of the ducts were modified to reflect the as-designed configuration. This helped reduce the shaking but did not eliminate it. Stantec examined the fans that were furnished by the unit manufacturer and determined that the actual performance of the installed equipment did not match the submitted shop drawing. Stantec prepared a technical memorandum with the findings of their investigation.

Pressure Control Investigation

\$16,855.04

The Authority requested that Stantec review the potential to control pumping station flow using discharge pressure in the station header before the flow control valve. During design, it was decided that the flow control valve would pace the pumping station flow based on an operator-initiated flow setpoint. The number of pumps operating would be selected based on the flow setpoint and the SCADA system would modulate the flow control valve based on the flow signal from the discharge flow meter. Staff were concerned that when a pump is added or removed from service due to increase or decrease in the flow setpoint, there could be a period of unstable flow into the plant while the flow control valve adjusts to the new flow setpoint. Stantec reviewed the hydraulic model developed during design, updating for the actual equipment used in construction,

and ran various scenarios to simulate pressure control functionality. Results of the model runs indicated that the as-designed control strategy was sufficiently stable to avoid adversely impacting plant performance and the design was not changed.

In-Shop Witness Tests \$10,055.36

Stantec made an additional trip to the manufacturer of the vertical turbine pumps in Indiana to witness shop testing of one pump that failed its initial test and required retest before shipment.

(ii) Claim for Design Errors (\$321,164)

The Authority maintains that design errors relating to the structural design of an 84-inch header pipe supports, valve vault steel reinforcing and surge tank steel casing resulted in significant rework by the Contractor in the amount of \$321,164. The Authority further claims there were additional errors/omissions on Contract 7156, some of which, while resulting in change order work, did not require rework by the Contractor. Staff estimate the value of the potential cost recovery on these additional items to be \$185,774; for a total potential claim for cost recovery against Stantec for additional work paid to the contractor of \$506,938 (on \$50.1 million spent to date on construction). Stantec disputes that the Authority is entitled to compensation from it for these items. Staff recommend settlement of the above cost recovery claim for \$321,164, or approximately 63%. This sum offsets Stantec’s additional costs set forth above.

CONTRACT SUMMARY:

	<u>AMOUNT</u>	<u>TIME</u>	<u>DATED</u>
Original Contract:	\$4,542,283.24	1,857 Days	2/1/2012
Amendment 1*	\$231,612.93	0 Days	4/2/2014
Amendment 2	\$1,768,344.15	1,157 Days	7/15/2015
Amendment 3	\$349,742.76	0 Days	12/14/2016
Amendment 4	\$711,617.02	0 Days	9/20/2017
Proposed Amendment 5:	<u>\$502,340.69</u>	<u>0 Days</u>	Pending
Adjusted Contract:	\$8,105,940.79	3,014 Days	

*Approved under delegated authority

BUDGET/FISCAL IMPACT:

FY20 CIP contains a budget of \$7,983,600.00 for Contract 7156. Including this amendment for \$502,340.69, the adjusted sub-phase total will be \$8,105,940.79 or \$122,340.79 over budget. This amount will be covered within the five-year CIP spending cap.

MBE/WBE PARTICIPATION:

The contractual MBE and WBE participation requirements of 7.59% and 10.10%, respectively, remain unchanged by this amendment.



MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

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PERSONNEL & COMPENSATION COMMITTEE MEETING

to be held on

Wednesday, September 18, 2019

Chair: J. Wolowicz
Vice-Chair: K. Cotter
Committee Members:
J. Carroll
P. Flanagan
J. Foti
A. Pappastergion
H. Vitale
J. Walsh

Location: 100 First Avenue, 2nd Floor
Charlestown Navy Yard
Boston, MA 02129

Time: Immediately following Water Committee

AGENDA

A. Approvals

1. PCR Amendments – September 2019
2. Appointment of Program Manager, Process Control and Project Support
3. Appointment of Program Manager, Wastewater Operations
4. Appointment of Manager, IT Security, Architecture and Engineering, MIS
5. Appointment of Communications Manager, Metropolitan Tunnel Redundancy Program
6. Appointment of Senior Staff Counsel, Law Division

B. Contract Amendments/Change Orders

1. Pay Equity Consulting Services: Hirsch Roberts Weinstein LLP, Contract A616, Amendment 1

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the

Personnel and Compensation Committee

July 17, 2019

A meeting of the Personnel and Compensation Committee was held on July 17, 2019 at the Authority headquarters in Charlestown. Committee Vice Chair Cotter presided. Present from the Board were Messrs. Carroll, Flanagan, Pappastergion, Peña, Vitale and Walsh. Ms. Wolowicz and Messrs. Cook and Foti were absent. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, Michele Gillen and Kristin MacDougall. The meeting was called to order at 12:17 p.m.

Approvals

* PCR Amendments - July 2019

The Committee recommended approval (ref. P&C A.1).

* Appointment of Director, Management Information Systems, Administration Division

The Committee recommended approval (ref. P&C A.2).

The meeting adjourned at 12:19 p.m.

* Committee recommendation approved by the Board on July 17, 2019

STAFF SUMMARY

TO: Board of Director
FROM: Frederick A Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: September PCR Amendments



COMMITTEE: Personnel and Compensation


Andrea Murphy, Director of Human Resources
Preparer/Title

 INFORMATION

 X VOTE


Michele S. Gillen
Director, Administration

RECOMMENDATION:

To approve amendments to the Position Control Register (PCR) included in the attached chart.

DISCUSSION:

The Position Control Register lists all positions of the Authority, filled and vacant. It is updated as changes occur and it is published at the end of each month. Any changes to positions during the year are proposed as amendments to the PCR. All amendments to the PCR must be approved by the Personnel Committee of the Board of Directors. All amendments resulting in an upgrade of a position by more than one grade level, and/or an amendment which creates a position increasing annual cost by \$10,000 or more, must be approved by the Board of Directors after review by the Personnel and Compensation Committee.

September PCR Amendments

There are three PCR Amendments this month.

The amendments are:

Organizational Changes

1. Title change to one vacant position in the Administration Division, MIS department from Program Manager, MIS Unit 6 Grade 12, to Business Systems Analyst III Unit 6 Grade 12 to meet staffing needs
2. Creation of a new position in the Operations Division, Planning Department as a Project Manager, Hydrologic and Hydraulic Monitoring Unit 9 Grade 25 to meet staffing needs on water and wastewater modeling projects.
3. Title and grade change for a filled position in the Finance Division, Risk Management department from Risk Management Claims Administrator Unit 1, Grade 22 to Administrator, Risk Management Unit 1, Grade 24 due to a union settlement.

The first amendment requires approval by the Personnel and Compensation Committee. The next two amendments require Board approval after review by the Personnel and Compensation Committee.

BUDGET/FISCAL IMPACT:

The annualized budget impact of these PCR amendments will be a maximum cost of \$107,492. Staff will ensure that the cost increase associated with these PCR amendments will not result in spending over the approved FY20 Wages and Salaries budget.

ATTACHMENTS:

Old Job Descriptions
New Job Descriptions

**MASSACHUSETTS WATER RESOURCES AUTHORITY
POSITION CONTROL REGISTER AMENDMENTS
FISCAL YEAR 2020**

PCR AMENDMENTS REQUIRING PERSONNEL & COMPENSATION COMMITTEE APPROVAL - September 18, 2019

Number	Current		V/F	Type	Current Title	UN	GR	Amended Title	UN	GR	Current/Budget	Estimated		Estimated Annual		Reason For Amendment	
	PCR #										Salary	New Salary		\$ Impact			
P3	Administration MIS 8610053		V	T	Program Manager, MIS	6R	12	Business Systems Analyst III	6	12	\$129,486	\$76,645	-	\$117,280	-\$52,841	-\$12,206	To meet staffing needs.
PERSONNEL & COMPENSATION COMMITTEE TOTAL=						1							TOTAL:		-\$52,841	-\$12,206	

PCR AMENDMENTS REQUIRING BOARD APPROVAL - September 18, 2019

Number	Current		V/F	Type	Current Title	UN	GR	Amended Title	UN	GR	Current/Budget	Estimated		Estimated Annual		Reason For Amendment	
	PCR #										Salary	New Salary		\$ Impact			
B3	Operations Planning N/A		N/A	N/A	N/A	N/A	N/A	Project Manager, Hydrologic and Hydraulic Monitoring	9	25	\$0	\$79,356	-	\$110,568	\$79,356	\$110,568	To meet staffing needs on water and wastewater modeling projects.
B4	Finance Risk Management 4610011		F	T, G	Risk Management Claims Administrator	1	22	Administrator, Risk Management	1	24	\$89,079	\$98,210	-	\$98,210	\$9,130	\$9,130	Union settlement.
BOARD TOTAL =						1							TOTAL ESTIMATED COSTS:		\$88,486	-\$119,698	
GRAND TOTAL =						2							TOTAL ESTIMATED COSTS:		\$35,645	-\$107,492	

**MWRA
POSITION DESCRIPTION**



POSITION: Program Manager, MIS

DIVISION: Administration & Finance

DEPARTMENT: Management Information Systems (MIS)

BASIC PURPOSE:

Manages staff, multiple system projects and software maintenance activities, across an entire application portfolio, to ensure the integrity of data and the quality of integration between applications. Responsible for understanding and supporting the business environment.

SUPERVISION RECEIVED:

Works under the general supervision of the appropriate application portfolio manager (Manager of Custom Support and Support [Administrative/Financial applications] and Data Resource Manager [Water and Sewer applications]).

SUPERVISION EXERCISED:

Exercises close supervision of assigned programming staff and technical resources.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Manages the integration of new releases of application software package upgrades from planning through implementation using Computer Assisted Engineering (CASE) and standard project management software tools.
- Oversees the day-to-day activities of assigned staff, including Database Analysts/Programmer Analysts, Senior Systems Analysts and Programmer Analysts as well as contract programmers, temporary employees and consultants.
- Develops multiple project plans, including time, cost and resource estimates and prepares periodic status reports to management.
- Prioritizes and analyzes business request(s) for development of new systems or improvements of existing systems, and recommends software and hardware solutions consistent with information system strategic plans, using standard systems development methodologies and cost-benefit analysis techniques.

- In conjunction with user management/liasons, determines objectives, nature, effectiveness and economics of new or improved procedures and methods related to business request(s) for development of new systems or improvements of existing systems.
- Manages user application steering committees and project team meetings.
- Participates in consultant selection, and staff hiring interviews; and conducts performance reviews.
- Develops system controls, both automated and manual, to ensure the integrity of integrated applications is maintained as the environment changes.
- Addresses professional organizations and application software vendor user groups from time-to-time and acts as liaison to various software vendors.
- Provides technical assistance and leadership to other staff in the development of projects and plans for the department.
- Ensures compliance with department standards for application development and maintenance.

SECONDARY DUTIES:

Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A four- (4) year college program in computer science or related field. Advanced degree is preferred; and
- (B) Six (6) to eight (8) years of experience in systems development and project management, of which at least two (2) years must be in a supervisory capacity is required; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) An understanding of project management tools and techniques, CASE tools and system development methodologies, Authority computer hardware (minis, PCs and workstations), communication networks, operating systems, relational and networked

databases and utility programs, and fluency with third and fourth generation languages.

- (B) Proven track record of accomplishment in managing computer integration projects across multiple hardware/software platforms to solve a diversity of business requirements.
- (C) Proficiency with the following required: 3rd and 4th generation languages, Oracle, Oracle Developer; and Lawson application software and UNIX (A&F systems) or Microsoft NT/2000 and Open VMS (Water & Sewer systems)
- (D) Excellent supervisory, analytical, interpersonal, written and oral communication skills are required.

SPECIAL REQUIREMENTS:

None.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone, personal computers including word processing and other software, copy and fax machines.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform essential functions.

While performing the duties of this job, the employee is regularly required to use hands to finger, handle, feel or operate objects, tools or controls and reach with hands and arms. The employee frequently is required to sit and talk or hear. The employee is occasionally required to walk and stand.

The employee must frequently lift and/or move up to 10 pounds and occasionally lift and/or move up to 25 pounds. Specific vision abilities required by this job include close vision and color vision, and the ability to adjust focus.

WORK ENVIRONMENT:

The work characteristics described here are representative of those an employee encounters while performing the essential functions of this job.

While performing the duties of this job, the employee occasionally works in various field settings

and in an office environment. The employee regularly works near moving mechanical parts.
The noise level in the work environment is a moderately quiet office setting.

July 2002

**MWRA
POSITION DESCRIPTION**



POSITION: Business Systems Analyst III
DIVISION: Administration
DEPARTMENT: Management Information System (MIS)

BASIC PURPOSE:

The Business Systems Analyst III works with business unit staff to understand business processes and to document and prioritize user requirements and functional specifications for new and existing systems that support the organizational needs. Serves as the conduit between the development team and the rest of the organization. Facilitates communications to expeditiously translate business requirements to help develop technical specifications as well as translate technical specification into language accessible to user and management audiences. Communicates and consults with end users or management to provide information regarding the costs and ramifications of the decisions made.

Evaluates MWRA application and business workflows, identifies improvements, documents requirements, prototyping, quality assurance and makes recommendations on how business processes can be improved through better implementation of technology. Identifies stake holders and develops Requirements Development Work Plans.

In addition, the Business Systems Analyst III will serve as Business Systems Analyst team lead and will update and maintain Business Systems Analysis specific project plans and schedules.

SUPERVISION RECEIVED:

Works under the general supervision of the Manager II, Business Systems Analysis

SUPERVISION EXERCISED:

Exercises supervision of assigned vendor resources and IT project team.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Use proven business analysis methodologies and elicitation techniques to:
 - Gather and document business, functional and technical requirements from business leaders, end users, and vendors for new and upgraded software applications (in-house and third party software).
 - Document project scope and vision documents.

- Support Quality Assurance/Quality Control activities including developing functional and user test acceptance test plans in conjunction with IT and user stakeholders.
- Research new approaches to improve business and system processes and develop reports and/or proposals for new or enhanced solutions.
- Identify and document documents gaps between the current as-is and recommended to-be processes.
- Collaborate with IT Department engineering staff contractors and vendors to support development of technical specification for appropriate system infrastructure hardware and software.
- Research, design, and test interfaces between existing and new system applications and platforms to produce seamless integration that complies with business requirements.
- Maintain professional interaction with the IT staff and user community to ensure adequate system functionality, promote team participation and encourage user confidence in the applications staff quality of service.
- Develop and maintains design documentation, report requirements and test plans of applications throughout the design process.
- Support user acceptance testing and release management activities.
- Coordinate vendor access and resources as assigned.
- Documents and communicates issues and risks.
- Develops and maintains Business Systems Analyst functional unit's business continuity documentation as appropriate.
- Maintains professional interaction with the Business Systems Analyst staff, user and extended IT community (i.e. project teams) to ensure adequate system functionality, promotes team participation and encourages user confidence in the IT Department's quality of service.
- Conducts stakeholder analyses by gathering and assessing information to determine whose interests should be taken into account for each project. Based on this analysis, identifies the stake holders for each project.
 - Develops Requirements Work Plan.
 - Manages Issue & Risk Lists as assigned.

- Coordinates project team testing and user acceptance testing for assigned projects ensuring testing is formalized, adheres to department standards and best practices.

SECONDARY DUTIES:

Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A four (4) year college program in management science, engineering management, computer science or related fields; and
- (B) Five (5) to seven (7) years experience gathering functional requirements, analyzing and accurately documenting requirements specifications, workflow diagrams, data flow diagrams, etc. to effectively communicate needs to internal and external development teams and/or developing and testing prototypes.
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- A) Formal training or certification on methodologies/frameworks for business systems analysis, project management, software development and IT Service Management such as:
 - Rapid Application Development SDLC methodologies such as Agile.
 - Project Management concepts and tools.
- (B) Analytical and interpersonal skills.
- (C) Written and oral communication skills.
- (D) Knowledge of the following is desirable: MS Project, MS Visio, MS .Net, J2EE, Crystal Reporting, ORACLE, SQL Server and PL/SQL.

SPECIAL REQUIREMENTS:

Information Technology Infrastructure Library (ITIL) Foundation Certification is required or the ability to obtain within 6 months.

International Institute of Business Analysis (IIBA) Certification or formal IIBA Training or the ability to obtain within one year.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone, personal computers including word processing and other software, copy and fax machines.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform essential functions.

While performing the duties of this job, the employee is regularly required to use hands to finger, handle, feel or operate objects, tools or controls and reach with hands and arms. The employee frequently is required to sit and talk or hear. The employee is occasionally required to walk and stand.

The employee must frequently lift and/or move up to 25 pounds and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision and color vision, and the ability to adjust focus.

WORK ENVIRONMENT:

The work characteristics described here are representative of those an employee encounters while performing the essential functions of this job.

While performing the duties of this job, the employee occasionally works in various field settings and in an office environment. The employee regularly works near moving mechanical parts, and is occasionally exposed to risk of vibration.

The noise level in the work environment is very loud in field settings, moderately loud at other work locations and moderately quiet at office settings.

December 2016

**MWRA
POSITION DESCRIPTION**



POSITION: Project Manager (Hydrologic and Hydraulic Modeling)

DIVISION: Operations

DEPARTMENT: Planning

BASIC PURPOSE:

Upgrades and manages the wastewater collection system and water distribution system hydrologic and hydraulic models, and assists with the management of the wastewater system model.

SUPERVISION RECEIVED:

Works under the general supervision of the Director of Planning with direct supervision and technical guidance from the Senior Program Manager of the Mapping, Modeling and Data Analysis Group.

SUPERVISION EXERCISED:

None.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Manages the master files of the wastewater and water systems hydrologic and hydraulic models, develops upgrades and future networks/input files. Issues new files to users with appropriate documentation.
- Manages and negotiates contracts with consulting engineering firms, software development and application firms, and software vendors.
- Performs periodic calibrations and verifications using MWRA wastewater or water metering data.
- Assists in meeting NPDES permit reporting requirements for CSO discharges.
- Supports MWRA staff in the Operations Department to work towards integrating future models with other applications such as SCADA, and NEXRAD Radar data and other related

systems in order to expand the capabilities of the model (move to real time predictability).

- Supports the project managers in other Operations Departments with work being done by consulting engineering firms or in-house staff on the study and design of Capital Projects.
- Performs modeling and analytical services as requested for operational issues, including but not limited to emergency situations.
- Completes specific modeling projects and prepares reports including results and recommendations.
- Coordinates with the operational GIS, and/or Database staff to obtain data on actual field conditions in order to refine data files for the hydraulic model and keep them current.
- Coordinates with the MIS Department regarding purchase of hardware, software and maintenance contracts. Prepares annual and supplementary budget requests for the program.
- Creates new models or expand available models, as needed, to include member communities' systems and subsystems within the MWRA network. Meets with community representatives to present/discuss results of modeling work and address community needs as necessary. Coordinates with member communities' model development efforts to encourage sharing of model input files and supporting data.
- Provides assistance and training to other staff related to the system models and its upgrades/master files.
- Ensures compliance with MWRA policies, procedures and directives, and with regulatory requirements and applicable engineering standards. Ensures all activities are coordinated with MWRA divisions and outside concerns as appropriate.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A four (4) year college degree in civil, sanitary, or environmental engineering or related field with an emphasis on hydraulic engineering; and

- (B) Six (6) to eight (8) years experience in wastewater/water facilities design (including hydrologic and hydraulic analysis utilizing computer modeling) and other wastewater/water facility engineering with at least two years in a supervisory capacity; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Demonstrated knowledge and skill in using computer applications, such as hydrologic and hydraulic models of water and wastewater systems, (e.g. HYDROWORKS/ InfoWorks, InfoWater, SWMM, XP-SWMM), databases, GIS and data collection systems.
- (B) Demonstrated knowledge and skill in the calibration and verification of complex hydrologic and hydraulic computer models.
- (C) Working knowledge of GIS and database structures.
- (D) Knowledge of principles and practices of engineering.
- (E) Demonstrated written and oral communication and organizational skills.

SPECIAL REQUIREMENTS:

A valid Massachusetts Class D Motor Vehicle Operators License

A Registered Professional Engineers License, preferred.

TOOLS AND EQUIPMENT USED:

Office machines as normally associated, with the use of telephone, personal computer including word processing and other software, copy and fax machine.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to sit, talk or hear. The employee is regularly required to use hands to finger, handle, feel or operate objects, including office equipment, or controls and reach with hands and arms. The employee frequently is required to stand and walk.

There are no requirements that weight is lifted or force is exerted in the performance of this job. Specific vision abilities required by this job include close vision, and the ability to adjust focus.

WORK ENVIRONMENT:

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. While performing the duties of this job, the employee regularly works in an office environment.

The noise level in the work environment is usually moderately quiet.

October 2013

**MWRA
POSITION DESCRIPTION**



POSITION: Project Manager (Hydrologic and Hydraulic Modeling)

DIVISION: Operations

DEPARTMENT: Planning

BASIC PURPOSE:

Upgrades and manages the wastewater collection system and water distribution system hydrologic and hydraulic models, and assists with the management of the wastewater system model.

SUPERVISION RECEIVED:

Receives direct supervision and technical guidance from the Senior Program Manager of the Mapping, Modeling and Data Analysis Group.

SUPERVISION EXERCISED:

None.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Works in collaboration with other water and wastewater hydraulic modelers in the Planning Department.
- Manages the master files of the wastewater and water systems hydrologic and hydraulic models, develops upgrades and future networks/input files. Issues new files to users with appropriate documentation.
- Manages and negotiates contracts with consulting engineering firms, software development and application firms, and software vendors.
- Performs modeling and analytical services as requested for operational issues, including emergency situations.

- Performs periodic calibrations and verifications using MWRA wastewater or water metering data.
- Assists in meeting NPDES permit reporting requirements for CSO discharges.
- Supports MWRA staff in the Operations Department to work towards integrating future models with other applications such as SCADA, and NEXRAD Radar data and other related systems in order to expand the capabilities of the model (move to real time predictability).
- Supports the project managers in other Operations Departments with work being done by consulting engineering firms or in-house staff on the study and design of Capital Projects.
- Completes specific modeling projects and prepares reports including results and recommendations.
- Coordinates with the operational GIS, and/or Database staff to obtain data on actual field conditions in order to refine data files for the hydraulic model and keep them current.
- Coordinates with the MIS Department regarding purchase of hardware, software and maintenance contracts. Prepares annual and supplementary budget requests for the program.
- Creates new models or expand available models, as needed, to include member communities' systems and subsystems within the MWRA network. Meets with community representatives to present/discuss results of modeling work and address community needs as necessary. Coordinates with member communities' model development efforts to encourage sharing of model input files and supporting data.
- Provides assistance and training to other staff related to the system models and its upgrades/master files.
- Ensures compliance with MWRA policies, procedures and directives, and with regulatory requirements and applicable engineering standards. Ensures all activities are coordinated with MWRA divisions and outside concerns as appropriate.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A Bachelor's degree in civil, sanitary, or environmental engineering or related field with an emphasis on hydraulic engineering; and
- (B) Six (6) to eight (8) years experience in wastewater/water facilities hydrologic and hydraulic analysis utilizing computer modeling and other wastewater/water facility operational or engineering experience ; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Demonstrated knowledge and skill in using computer applications, such as hydrologic and hydraulic models of water and wastewater systems, (e.g. HYDROWORKS/ InfoWorks, InfoWater, SWMM, XP-SWMM), databases, GIS and data collection systems.
- (B) Demonstrated knowledge and skill in the calibration and verification of complex hydrologic and hydraulic computer models.
- (C) Working knowledge of GIS and database structures.
- (D) Knowledge of principles and practices of engineering.
- (E) Demonstrated written and oral communication and organizational skills.

SPECIAL REQUIREMENTS:

A valid Massachusetts Class D Motor Vehicle Operators License

A Registered Professional Engineers License is preferred.

TOOLS AND EQUIPMENT USED:

Office machines as normally associated, with the use of telephone, personal computer including word processing and other software, copy and fax machine.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to sit, talk or hear. The employee is regularly required to use hands to finger, handle, feel or operate objects, including office equipment, or controls and reach with hands and arms. The employee frequently is required to stand and walk.

There are no requirements that weight is lifted or force is exerted in the performance of this job. Specific vision abilities required by this job include close vision, and the ability to adjust focus.

WORK ENVIRONMENT:

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. While performing the duties of this job, the employee regularly works in an office environment.

The noise level in the work environment is usually moderately quiet.

September 2019

**MWRA
POSITION DESCRIPTION**



POSITION: Administrator, Risk Management

DIVISION: Finance

DEPARTMENT: Risk Management

BASIC PURPOSE:

Assists in the assessment, administration and resolution of automobile, property damage and liability claims. Assists in the development of procedures for occurrence and accident reports for property, liability and automobile accidents to ensure all relevant information is obtained. Tracks workers' compensation and employment-related claims to prepare documentation and follow procedures in case there is eligibility for coverage under an excess policy. Monitors and maintains proper reporting documents on MWRA Intranet site for employees use; update as necessary.

SUPERVISION RECEIVED:

Works under the general supervision of the Manager, Risk Management.

SUPERVISION EXERCISED:

None.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

Administers the in-house claim handling process for self-insured automobile, general liability and property damage claims including:

- Collecting, reviewing and coordinating all claims reported by claimants; investigates each claim for accurate information; including requesting information from insurance companies; attorneys and relevant police department reports.
- Analyzes and assigns reserve amounts particular to each claim.
- Maintains claim records, documents and files for historical and retrieval purposes.
- Ascertains claims information by interviewing claimants and witnesses, and obtaining insurance company or police reports.

- Negotiates the resolution of claims with employees, third party claimants and insurance companies as directed by Risk Manager.
- Processes the subrogation of all claims where third party liability is established.
- Interviews claimants and employees in reviewing liability; works in conjunction with other departments/divisions including internal Safety and Security department; police officers; third party claims adjusters.
- Completes standardized and customized general release documents and adheres to all MWRA policies in the processing and resolution of claims.
- Coordinates support services relating to claims including: immediate property or automobile adjusting services, emergency clean-up response for safety conditions; arrange for housing on liability claims and vehicle rental on automobile claims.
- Visits claims sites and takes photographs of area of incident or accident and produces written reports or observation and explanation in determining general liability, including visiting with claimants and witnesses.
- Ensures all policies and procedures are strictly adhered to prior to issuing claims payments; including payments to claimants and outside vendors. Process necessary paperwork for the payment of claims and other department invoices.
- Maintains database of claim information and generates reports on a continuing basis and, as necessary, for various Risk Management activities including incidents of automobile, general liability and property damage claims.
- Assists in the annual procurement of all MWRA insurance programs by obtaining and compiling necessary rating data information.
- Assists with the completion and processing of MWRA insurance policy applications and MWRA self-insurance license applications.
- Assists with insurance certificate program administration including data base management report generation, certificate monitoring and vendor interface for gathering updated information.
- When necessary acts as Risk Management liaison to various entities including, Law Division for all claims that have become lawsuits, MWRA communities by assisting in the dissemination of information, instructions and procedures for communities impacted by losses: and Emergency Operations Center (EOC) when and as requested by MWRA

Risk Manager.

- Monitors all open MWRA workers' compensation claims for purposes of compliance with MWRA Workers Compensation Excess Policy notifications requirements and excess claim reimbursement process. Tasks include attending claim review meetings with TPA to review claim status, coordination with claim adjusters to ensure proper notification to Excess Insurance Companies, review of claim documents to verify amounts paid in excess of retention and coordinate with parties to ensure timely and accurate reimbursement from excess carriers.
- Monitors employment related claim activity and identify when Notice of Claim is required to be sent to Insurance Company. When applicable, prepares First Notice of Claim along with supporting documents, coordinate activities and document requests with HR and Law Division, and respond to inquiries and request for information from Insurance company.
- Serves as Risk Management Department document control liaison.

SECONDARY DUTIES:

Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) Analytical and writing skills as normally acquired through a Bachelor's degree in business, public administration, claims management, insurance, dispute resolution or a related field; and
- (B) Five (5) to seven (7) years of related administrative or insurance claim administration experience; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Excellent interpersonal, oral and written communication skills are required.
- (B) Ability to effectively interface with outside constituents including insurance companies, brokers and homeowners on issues relating to sensitive disputed matters.
- (C) Familiarity with personal computers and working knowledge of standard MWRA office

automation products including Access, Excel, MS Word and Power Point.

SPECIAL REQUIREMENTS:

A valid Massachusetts Class D Motor Vehicle Operators License.

TOOLS AND EQUIPMENT USED:

Office machines as normally associated, with the use of telephone, personal computer including word processing and other software, copy, scan and fax machine. Use of camera will be required to collect accident scene pictures.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to sit, talk or hear. The employee is frequently required to use hands to finger, handle, feel or operate objects, including office equipment, or controls and reach with hands and arms. The employee is occasionally required to stand and walk. The employee will be required to make periodic off site visits to accident scenes.

There are no requirements that weight be lifted or force be exerted in performing the duties of this job. Specific vision abilities required by this job include close vision and the ability to adjust focus.

WORK ENVIRONMENT:

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job.

While performing the duties of this job, the employee regularly works in an office environment with periodic off site visits to accident scenes.

The noise level in the work environment is usually moderately.

September 2019

**MWRA
POSITION DESCRIPTION**



POSITION: Risk Management Claims Administrator

DIVISION: Finance

DEPARTMENT: Risk Management

BASIC PURPOSE:

Assists in the assessment, administration and resolution of automobile, property damage and liability claims. Assists in the development of procedures for occurrence and accident reports for property, liability and automobile accidents to ensure all relevant information is obtained. Monitors and maintains proper reporting documents on MWRA Intranet site for employees use; update as necessary.

SUPERVISION RECEIVED:

Works under the general supervision of the Manager, Risk Management.

SUPERVISION EXERCISED:

None.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

Administers the in-house claim handling process for self-insured automobile, general liability and property damage claims including:

- Collecting, reviewing and coordinating all claims reported by claimants; investigates each claim for accurate information; including requesting information from insurance companies; attorneys and relevant police department reports.
- Analyzes and assigns reserve amounts particular to each claim.
- Maintains claim records, documents and files for historical and retrieval purposes.
- Ascertain claims information by interviewing claimants and witnesses, and obtaining insurance company or police reports.

- Negotiates the resolution of claims with employees, third party claimants and insurance companies as directed by Risk Manager.
- Processes the subrogation of all claims where third party liability is established.
- Interviews claimants and employees in reviewing liability; works in conjunction with other departments/divisions including internal Safety and Security department; police officers; third party claims adjusters.
- Completes standardized and customized general release documents and adheres to all MWRA policies in the processing and resolution of claims.
- Coordinates support services relating to claims including: immediate property or automobile adjusting services, emergency clean-up response for safety conditions; arrange for housing on liability claims and vehicle rental on automobile claims.
- Visits claims sites and takes photographs of area of incident or accident and produces written reports or observation and explanation in determining general liability, including visiting with claimants and witnesses.
- Ensures all policies and procedures are strictly adhered to prior to issuing claims payments; including payments to claimants and outside vendors. Process necessary paperwork for the payment of claims and other department invoices.
- Maintains database of claim information and generates reports on a continuing basis and, as necessary, for various Risk Management activities including incidents of automobile, general liability and property damage claims.
- Assists in the annual procurement of all MWRA insurance programs by obtaining and compiling necessary rating data information.
- Assists with the completion and processing of MWRA insurance policy applications and MWRA self-insurance license applications.
- Assist with Insurance certificate program administration including data base management, report generation, certificate monitoring and vendor interface for gathering updated information.
- When necessary acts as Risk Management liaison to various entities including, Law Division for all claims that have become lawsuits, MWRA communities by assisting in the dissemination of information, instructions and procedures for communities impacted by losses: and Emergency Operations Center (EOC) when and as requested by MWRA

Risk Manager.

- Serve as Risk Management Department document control liaison.

SECONDARY DUTIES:

Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) Analytical and writing skills as normally acquired through a two (2) year college program in business, public administration, claims management, insurance, dispute resolution or a related field; and
- (B) Four (4) to six (6) years of related administrative or insurance claim administration experience; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Excellent interpersonal, oral and written communication skills are required.
- (B) Ability to effectively interface with outside constituents including insurance companies, brokers and homeowners on issues relating to sensitive disputed matters.
- (C) Familiarity with personal computers and working knowledge of standard MWRA office automation products including Access, Excel, MS Word and Power Point.

SPECIAL REQUIREMENTS:

A valid Massachusetts Class D Motor Vehicle Operators License.

TOOLS AND EQUIPMENT USED:

Office machines as normally associated, with the use of telephone, personal computer including word processing and other software, copy , scan and fax machine. Use of camera will be required to collect accident scene pictures.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to sit, talk or hear. The employee is frequently required to use hands to finger, handle, feel or operate objects, including office equipment, or controls and reach with hands and arms. The employee is occasionally required to stand and walk. The employee will be required to make periodic off site visits to accident scenes.

There are no requirements that weight be lifted or force be exerted in performing the duties of this job. Specific vision abilities required by this job include close vision and the ability to adjust focus.

WORK ENVIRONMENT:


The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job.

While performing the duties of this job, the employee regularly works in an office environment with periodic off site visits to accident scenes.

The noise level in the work environment is usually moderately.

August 2015

STAFF SUMMARY


TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: September 18, 2019
SUBJECT: Appointment of Program Manager, Process Control and Project Support

COMMITTEE: Personnel & Compensation

INFORMATION

VOTE

Andrea Murphy, Director, Human Resources
Valerie Moran, P.E., Deputy Director, Waterworks
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To approve the appointment of Ms. Kristen Hall to the position of Program Manager, Process Control and Project Support (Unit 9, Grade 29), in the Operations Engineering Department, at an annual salary of \$128,958.93, commencing on a date to be determined by the Executive Director.

DISCUSSION:

The Program Manager of Process Control and Project Support provides technical support to wastewater and water operations and is responsible for managing and optimizing process control systems for wastewater and water facilities. The position works under the general supervision of the Senior Program Manager and manages in-house operations engineering staff in the Process Control and Project Support unit. The Program Manager provides technical assistance for the planning, design and construction of system improvements. The position is also responsible for managing the utilization of existing MWRA software and databases to analyze and monitor water and wastewater system hydraulic performance, and for problem solving operations and maintenance issues.

Selection Process

This position was posted internally. Three candidates applied for the position and one candidate was determined to be qualified and was referred for an interview. The Deputy Director of Waterworks and the Senior Program Manager, Process Control and Project Support conducted the interview. Upon completion of the interview, Ms. Hall was determined to be well qualified to fill the position based on her experience, knowledge, skills and education.

Ms. Hall has over 25 years of engineering experience at the MWRA. She began her career in the Wastewater Metering group as a Data Analyst, progressing to Staff Engineer and then to Project Engineer. During that period, she gained extensive experience in monitoring system hydraulic

performance by utilizing MWRA's Telog database. She developed graphics and documents to aid in monitoring the MWRA sewer system, diagnose and explain system events. She also developed project scopes for system improvements and performed technical reviews for improvement projects for both the MWRA's and for community systems. Ms. Hall has worked for the past 15 years as a Project Manager in the Planning Department. In her current position, she is responsible for managing all aspects of the MWRA's Local Water Assistance Program, which requires the technical review of all program projects along with providing technical assistance to the communities when the projects are implemented. She is also currently managing the MWRA's leak detection program including developing the scope of services and managing all aspects of the program. Ms. Hall has proven to be reliable and capable of managing projects and working with outside contractors, consultants and in-house staff with minimal guidance. She has developed and cultivated strong, positive relationships with MWRA member community municipal officials, including public works, water and wastewater staff.

Ms. Hall has a Bachelor of Science in Civil Engineering from Tufts University.

BUDGET/FISCAL IMPACT:

There are sufficient funds in the FY20 Current Expense Budget to fund this position.

ATTACHMENTS:

Resume of Kristen Hall
Position Description
Operations Engineering Department Organization Chart

Kristen Hall

Experience **Project Manager, MWRA**

2004-present

- Manage all aspects of MWRA's Local Water System Assistance Program. Responsibilities include: review of community funding applications and technical specifications, development of legal borrowing documents, meeting with community officials and consultants, coordination with outside Bond attorneys and MWRA staff, and approval of invoices in preparation of project closeout packages
- Manage MWRA's Leak Detection Survey Services Contract. Responsibilities include: development of project scope, coordination with MWRA staff to initiate procurement process, participation in contractor selection committee, preparation of contract documents, and management of three contractors working within MWRA communities
- Analysis of community wastewater data for use in MWRA's rates development. Responsibilities include: retrieval of data from Telog software, review of data for possible operational problems, community I/I analysis, examination of individual meter data as well as community level data as requested by MWRA communities, and development of annual NPDES I/I reports for Deer Island and Clinton treatment plants

Project Engineer, MWRA

1999-2004

- Coordinated all meetings, workshops and activities of MWRA's I/I Task Force
- Managed MWRA's Water Conservation Program, including purchase, tracking and distribution of literature and devices
- Initiated and managed contract to develop CMOM related materials specific to MWRA facilities
- Assisted in managing MWRA's Local Pipeline Assistance Program to fund water main rehabilitation/replacement projects
- Developed and coordinated the submittal of MWRA's annual NPDES Demand Management Report and I/I reports for Deer Island and Clinton
- Coordinated with metering and monitoring staff on wastewater metering data
- Provided technical assistance to MWRA communities as needed

Staff Engineer, MWRA

1996-1999

- Reviewed and commented on contract specifications and plans for Authority funded sewer improvement projects
- Assisted Project Managers with coordination and management of community projects, including I/I reduction, system optimization and I/I Local Financial Assistance Program funded construction project inspections
- Met with MWRA member community representatives, provided technical assistance to communities regarding various aspects of civil engineering work, and coordinated regional I/I reduction programs

Data Analyst, MWRA

1993-1996

- Responsible for the collection, analysis and storage of depth, velocity and flow data from 78 wastewater meters in the MWRA South System used in the calculation of sewer rates
- Coordinated field maintenance and calibration of wastewater flow meters with Transport Department staff
- Determined reliability of wastewater flow data provided by field personnel

Education Tufts University, Medford, MA

Bachelor of Science, Civil Engineering, 1992

**MWRA
POSITION DESCRIPTION**

POSITION: Program Manager, Wastewater Operations

PCR#:

DIVISION: Field Operations

DEPARTMENT: Wastewater Operations

BASIC PURPOSE:

Assists the Manager of Operations in managing the operation of the Authority's Wastewater OCC, wastewater pumping stations, headworks and CSO facilities. Manages wet weather events, develops Standard Operating Procedures (SOPs), trains staff on SOPs, facility operations, process control procedures and emergency response plans. Coordinates maintenance programs, acts as a construction liaison as well as an Operational advisor.

SUPERVISION RECEIVED

Works under the general supervision of the Manager of Operations

SUPERVISION EXERCISED:

Will exercise close supervision over wastewater operations staff.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Develops, updates and ensures implementation of Standard Operating Procedures (SOPs) for all wastewater facilities. Develops operational and inspection protocols for operations staff as directed by the Manager of Operations.
- Manages predictive and preventive maintenance initiatives. Works closely with Operations Supervisors, Maintenance Managers and Work Coordination Managers to ensure all work orders are issued, completed and closed in a timely manner. Conducts periodic audits on Operations staff maintenance activities. Attends weekly maintenance coordination meetings. Utilizes Maximo to open and process work orders as required.
- Responsible for coordinating all aspects of communication/Tellog, PLC, system alarms with SCADA, Metering and Engineering groups.

- Responsible for operations involvement on construction projects, attend construction meetings and participates in the construction and start-up of new facilities.
- Performs facility audits, facility inspections, SPCC inspections and staff scheduling issues as directed by the Manager of Operations. Responsible for scanner system and updates of new technology associated with facility automation as needed.
- Manages departmental records relating to the Yellow/Orange Notebooks.
- Utilizes PI Processbook to monitor facility operation and to gather information to produce reports. Gathers data and formulates storm reports for Wastewater Operations.
- Acts as liaison to the safety coordinator and implements recommendations as needed. Responsible for the safe operation of all wastewater system components and ensures all staff are in compliance with all MWRA safety policies and procedures.
- Manages wet weather events for Wastewater Operations.
- Trains staff on proper Operational Techniques and Emergency Response.

SECONDARY DUTIES:

- Performs related duties as required

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) B.S. in Mechanical, Electrical, or Civil Engineering or related field; or
- (B) Demonstrated knowledge of wastewater operations and wastewater equipment maintenance and practices as acquired by seven (7) to nine (9) years experience in the field including three (3) years of experience supervising staff and/or large projects; or
- (C) Any combination of education and experience.

Necessary Knowledge, Skills, and Abilities:

- (A) Ability to read and interpret plans and drawings.

- (B) Proficient in the use of personal computers and associated Microsoft Office software programs, including Word, Excel, and Access.
- (C) Experience with the CMMS software MAXIMO.
- (D) Trained in Confined Space Entry and capable of entering, of setting up, installing, disassembling confined space equipment and ability to work in a confined space

SPECIAL REQUIREMENTS:

A valid Grade 5 Wastewater Operator's license, or the ability to obtain within 6 months.

A valid Grade 4 Collections System Certification, or the ability to obtain within 6 months.

A valid Massachusetts Class D Motor Vehicle Operator's License.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone and personal computer.

PHYSICAL DEMANDS:

The physical demands here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to use hands fingers, handle, feel or operate objects, including office equipment or controls and reaches with hands and arms. The employee must frequently lift and or move up to 10 pounds, occasionally lift/or move up to 25 pounds. Specific vision abilities required by this job include close vision, distance vision, depth perception and the ability to focus.

WORK ENVIRONMENT:

The work environment characteristics here are representative of those an employee encounters while performing the essential functions of this job.

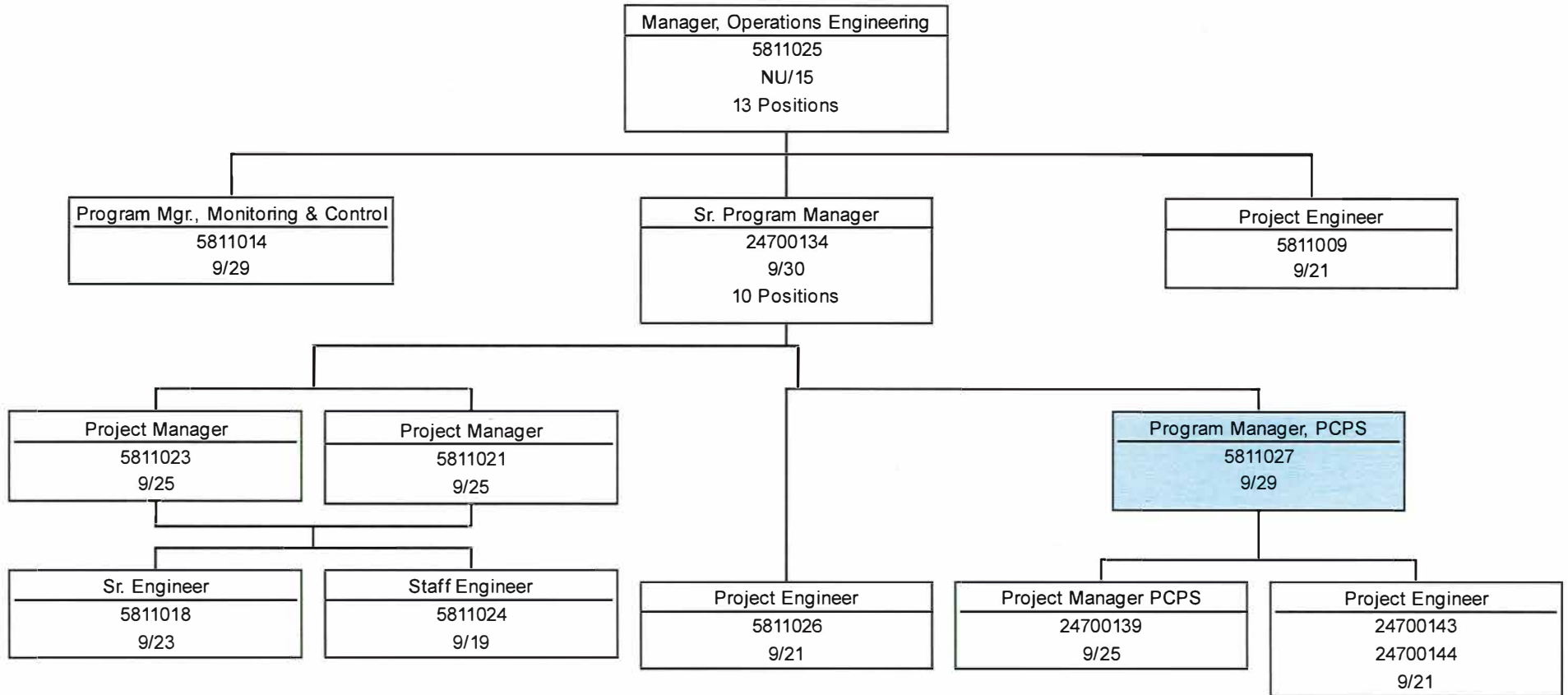
While performing the duties of this job, the employee regularly works in an office environment. The employee will also be exposed to outdoor weather conditions. The employee is occasionally exposed to fumes and airborne particles.

The noise level in the work environment is a moderately quiet setting.


June 2019

Operations Engineering

September 2019



STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: September 18, 2019
SUBJECT: Appointment of Program Manager, Wastewater Operations

COMMITTEE: Personnel & Compensation

INFORMATION
 VOTE

Charles Ryan, Director, W.W. Operations & Maintenance
Stephen Cullen, Director, Wastewater
Andrea Murphy, Director, Human Resources
Preparer/Title


David W. Coppes, PE
Chief Operating Officer

RECOMMENDATION:

To approve the appointment of Mr. William Lane to the position of Program Manager, Wastewater Operations (Unit 9, Grade 29), in the Wastewater Operations and Maintenance Department, at an annual salary of \$114,681.68, commencing on a date to be determined by the Executive Director.

DISCUSSION:

The Program Manager Wastewater Operations is a new position that was created and approved by the Board of Directors in February 2019 to assist with the management of all aspects of wastewater operations. This position will assist the Manager of Operations in the management of the Wastewater Operations Control Center, wastewater pumping stations, headworks and CSO facilities. The Program Manager will be responsible for supervising wastewater operations staff, managing wet weather events, developing Standard Operating Procedures (SOPs), and training staff on SOPs, facility operations, process control procedures and emergency response plans. The position will also coordinate maintenance programs, and act as a liaison to the Engineering and Construction Department.

Organizationally, the Program Manager reports to the Manager of Operations, Wastewater Operations and Maintenance Department (see attached Organization Chart).

Selection Process

The Program Manager position was posted internally. A total of 11 candidates applied for the position, six of whom were determined to be qualified and were referred for an interview. The Director of Wastewater, Director of Wastewater Operations and Maintenance and the Associate Special Assistant to Affirmative Action interviewed all six candidates. Upon completion of the interviews, Mr. William Lane was determined to be the best qualified candidate for the position based on his wastewater operations experience, relevant supervisory experience, knowledge and skills.

Mr. Lane began his career with the former Metropolitan District Commission 40 years ago and has continued to work at MWRA since its creation. After serving in the United States Marines, Mr. Lane started at the old Nut Island Treatment Plant beginning as a Laborer and was promoted several times to positions of increasing responsibility, until becoming an Area Supervisor. During that time, he played an essential role in MWRA's transition to the new Nut Island Headworks. In 2009, Mr. Lane was promoted to Operations Supervisor in the Wastewater Operations Control Center, where he helped to create many of the standing policies and procedures currently used by wastewater operations. He has in-depth experience operating and supervising the operation of the MWRA's 13 wastewater pump stations, four headworks facilities, three CSO facilities and two CSO storage facilities. He has extensive experience supervising wastewater operations staff and a solid understanding of the operation of the Operations Control Center.

Mr. Lane has a thorough understanding of MWRA's SCADA system and MWRA's automated work order system, Maximo. He has successfully demonstrated the ability to manage multiple projects, has excellent leadership skills, and has earned the respect of his supervisors, employees and colleagues.

Mr. Lane holds a Grade IV Wastewater Treatment License and a Grade IV Collections Certification.

BUDGET/FISCAL IMPACTS:

There are sufficient funds for this position in the Operations Division's FY20 Current Expense Budget. The recommended salary is in accordance with guidelines established in Unit 9's current collective bargaining agreement.

ATTACHMENTS:

Resume of William Lane
Position Description
Organizational Chart

William J. Lane

Objective

To utilize my knowledge, experience and education to advance my career at the MWRA and obtain a position of increased responsibility that will be mutually beneficial to the MWRA and myself.

- Self-starter who can meet objectives with little supervision
- Strong knowledge of the operation and maintenance of large municipal wastewater collection systems
- Maintains excellence in leadership and organizational skills

Experience

Operations Supervisor

Massachusetts Water Resources Authority, Chelsea, MA

2009 – Present

- Oversee the operation and supervision of the Wastewater OCC and its CSO facilities, pumping stations and head works.
- Work with wastewater management to deal with facility, agency, and personnel issues
- Supervise wastewater staff and the operation of wastewater facilities during the wet weather events, including staffing and reviewing activation logs
- Write daily shift activity reports detailing problems and resolutions
- Monitor SCADA and develop set points for process control
- Assist in creating SOP's for training
- Utilize understanding of Maximo to oversee the completion of shift PMs, opening service requests, and that corrective maintenance is completed

Area Supervisor (Nut Island Headworks)

Massachusetts Water Resources Authority, Quincy, MA

1993 – 2009

- Direct facility staff including roving maintenance/contractors and landscapers
- Maintain \$100 million dollar facility with a 400 MGD flow
- Established and implemented reporting logs, staff schedules
- Involved with SCADA from inception
- Manage PM's and also supervise all light maintenance assignments
- Original OCC control and TELOG center operator
- Supervise and assign roving operations to headworks facilities

Sewage Treatment Plant Operator (Nut Island)

Massachusetts Water Resources Authority, Quincy, MA

1992 – 1993

- Supervised shift of 6 employees and operated 200 MGD facility
- Participated in transition team of new Nut Island Headworks facility

Assistant Sewage Treatment Plant Operator (Nut Island)

MDC/Massachusetts Water Resources Authority, Quincy, MA

1980 – 1992

- Assisted operator in running on Nut Island Facility

- Operated sludge barge loading, diesel engines, chlorine tankers, digesters, sedimentation tanks, grit facility, odor control and chemical feed

Laborer/Attendant (Nut Island)

Metropolitan District Commission, Quincy, MA

1979 – 1980

- Worked on maintaining and repairing all equipment with mechanics
- Assisted in construction of maintenance facilities at Nut Island

Assembler/Wiring

Dobbie Engineering, Watertown, MA

1976 – 1979

- Built transformers from inception, according to prints

Education

Charlestown High School – 1968 -1972 (Diploma)

United States Marine Corps. – 1972 -1975 (Honorable Discharge)

Leadership

NAGE Local 168 President (260 members, 7 Executive Board members)

Member of Steering Committee

Member of Employee Reorganization Committee

Established and implemented new OCC procedures during transition in 2009

Received Excellence in Performance Award for Nut Island Headworks

Elected National Vice President of NAGE out of 45,000 members

Member of NAGE Budget Committee

**MWRA
POSITION DESCRIPTION**

POSITION: Program Manager, Wastewater Operations

PCR#:

DIVISION: Field Operations

DEPARTMENT: Wastewater Operations

BASIC PURPOSE:

Assists the Manager of Operations in managing the operation of the Authority's Wastewater OCC, wastewater pumping stations, headworks and CSO facilities. Manages wet weather events, develops Standard Operating Procedures (SOPs), trains staff on SOPs, facility operations, process control procedures and emergency response plans. Coordinates maintenance programs, acts as a construction liaison as well as an Operational advisor.

SUPERVISION RECEIVED

Works under the general supervision of the Manager of Operations

SUPERVISION EXERCISED:

Will exercise close supervision over wastewater operations staff.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Develops, updates and ensures implementation of Standard Operating Procedures (SOPs) for all wastewater facilities. Develops operational and inspection protocols for operations staff as directed by the Manager of Operations.
- Manages predictive and preventive maintenance initiatives. Works closely with Operations Supervisors, Maintenance Managers and Work Coordination Managers to ensure all work orders are issued, completed and closed in a timely manner. Conducts periodic audits on Operations staff maintenance activities. Attends weekly maintenance coordination meetings. Utilizes Maximo to open and process work orders as required.
- Responsible for coordinating all aspects of communication/Tellog, PLC, system alarms with SCADA, Metering and Engineering groups.

- Responsible for operations involvement on construction projects, attend construction meetings and participates in the construction and start-up of new facilities.
- Performs facility audits, facility inspections, SPCC inspections and staff scheduling issues as directed by the Manager of Operations. Responsible for scanner system and updates of new technology associated with facility automation as needed.
- Manages departmental records relating to the Yellow/Orange Notebooks.
- Utilizes PI Processbook to monitor facility operation and to gather information to produce reports. Gathers data and formulates storm reports for Wastewater Operations.
- Acts as liaison to the safety coordinator and implements recommendations as needed. Responsible for the safe operation of all wastewater system components and ensures all staff are in compliance with all MWRA safety policies and procedures.
- Manages wet weather events for Wastewater Operations.
- Trains staff on proper Operational Techniques and Emergency Response.

SECONDARY DUTIES:

- Performs related duties as required

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) B.S. in Mechanical, Electrical, or Civil Engineering or related field; or
- (B) Demonstrated knowledge of wastewater operations and wastewater equipment maintenance and practices as acquired by seven (7) to nine (9) years experience in the field including three (3) years of experience supervising staff and/or large projects; or
- (C) Any combination of education and experience.

Necessary Knowledge, Skills, and Abilities:

- (A) Ability to read and interpret plans and drawings.

- (B) Proficient in the use of personal computers and associated Microsoft Office software programs, including Word, Excel, and Access.
- (C) Experience with the CMMS software MAXIMO.
- (D) Trained in Confined Space Entry and capable of entering, of setting up, installing, disassembling confined space equipment and ability to work in a confined space

SPECIAL REQUIREMENTS:

A valid Grade 5 Wastewater Operator's license, or the ability to obtain within 6 months.

A valid Grade 4 Collections System Certification, or the ability to obtain within 6 months.

A valid Massachusetts Class D Motor Vehicle Operator's License.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone and personal computer.

PHYSICAL DEMANDS:

The physical demands here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to use hands fingers, handle, feel or operate objects, including office equipment or controls and reaches with hands and arms. The employee must frequently lift and or move up to 10 pounds, occasionally lift/or move up to 25 pounds. Specific vision abilities required by this job include close vision, distance vision, depth perception and the ability to focus.

WORK ENVIRONMENT:

The work environment characteristics here are representative of those an employee encounters while performing the essential functions of this job.

While performing the duties of this job, the employee regularly works in an office environment. The employee will also be exposed to outdoor weather conditions. The employee is occasionally exposed to fumes and airborne particles.

The noise level in the work environment is a moderately quiet setting.

June 2019

William J. Lane

Objective

To utilize my knowledge, experience and education to advance my career at the MWRA and obtain a position of increased responsibility that will be mutually beneficial to the MWRA and myself.

- Self-starter who can meet objectives with little supervision
- Strong knowledge of the operation and maintenance of large municipal wastewater collection systems
- Maintains excellence in leadership and organizational skills

Experience

Operations Supervisor

Massachusetts Water Resources Authority, Chelsea, MA

2009 – Present

- Oversee the operation and supervision of the Wastewater OCC and its CSO facilities, pumping stations and head works.
- Work with wastewater management to deal with facility, agency, and personnel issues
- Supervise wastewater staff and the operation of wastewater facilities during the wet weather events, including staffing and reviewing activation logs
- Write daily shift activity reports detailing problems and resolutions
- Monitor SCADA and develop set points for process control
- Assist in creating SOP's for training
- Utilize understanding of Maximo to oversee the completion of shift PMs, opening service requests, and that corrective maintenance is completed

Area Supervisor (Nut Island Headworks)

Massachusetts Water Resources Authority, Quincy, MA

1993 – 2009

- Direct facility staff including roving maintenance/contractors and landscapers
- Maintain \$100 million dollar facility with a 400 MGD flow
- Established and implemented reporting logs, staff schedules
- Involved with SCADA from inception
- Manage PM's and also supervise all light maintenance assignments
- Original OCC control and TELOG center operator
- Supervise and assign roving operations to headworks facilities

Sewage Treatment Plant Operator (Nut Island)

Massachusetts Water Resources Authority, Quincy, MA

1992 – 1993

- Supervised shift of 6 employees and operated 200 MGD facility
- Participated in transition team of new Nut Island Headworks facility

Assistant Sewage Treatment Plant Operator (Nut Island)

MDC/Massachusetts Water Resources Authority, Quincy, MA

1980 – 1992

- Assisted operator in running on Nut Island Facility

- Operated sludge barge loading, diesel engines, chlorine tankers, digesters, sedimentation tanks, grit facility, odor control and chemical feed

Laborer/Attendant (Nut Island)

Metropolitan District Commission, Quincy, MA

1979 – 1980

- Worked on maintaining and repairing all equipment with mechanics
- Assisted in construction of maintenance facilities at Nut Island

Assembler/Wiring

Dobbie Engineering, Watertown, MA

1976 – 1979

- Built transformers from inception, according to prints

Education

Charlestown High School – 1968 -1972 (Diploma)

United States Marine Corps. – 1972 -1975 (Honorable Discharge)

Leadership

NAGE Local 168 President (260 members, 7 Executive Board members)

Member of Steering Committee

Member of Employee Reorganization Committee

Established and implemented new OCC procedures during transition in 2009

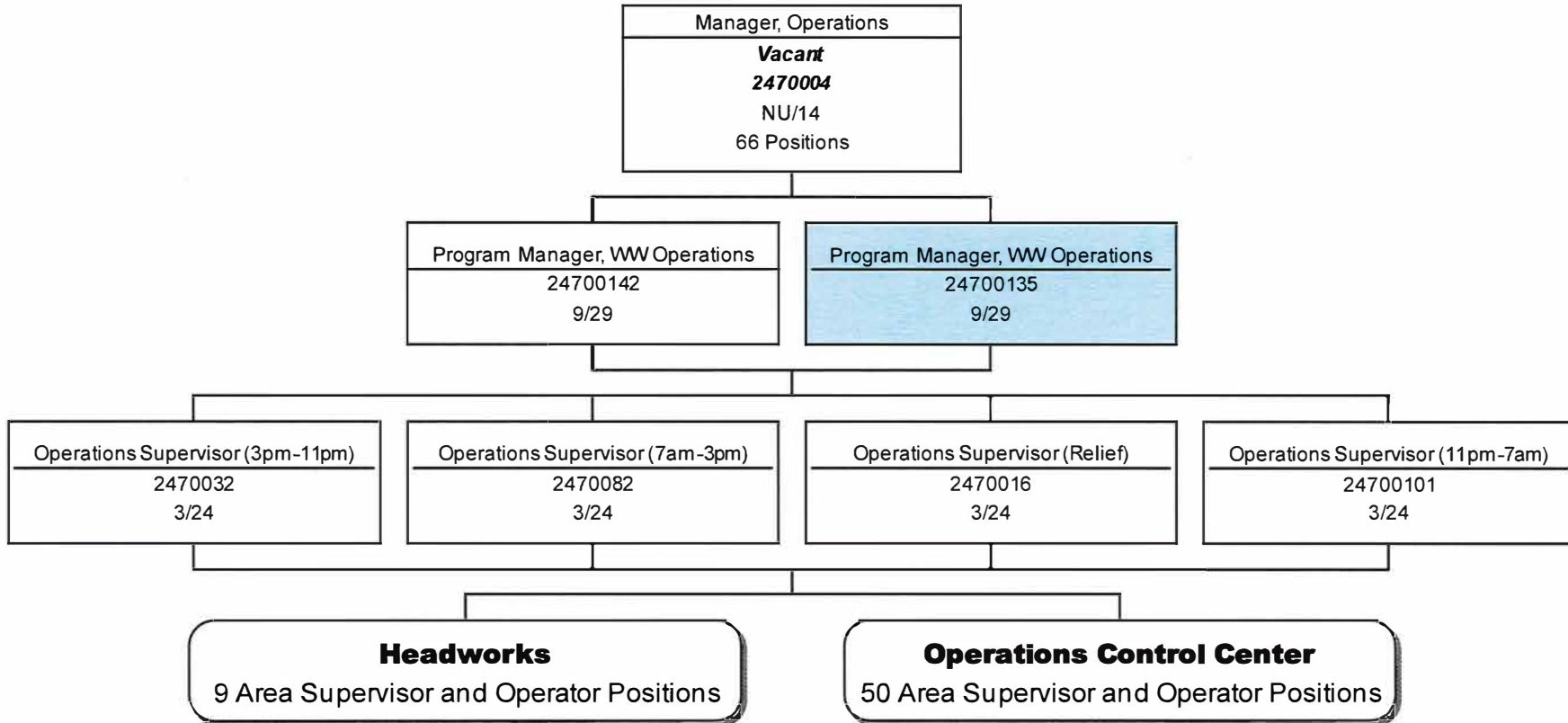
Received Excellence in Performance Award for Nut Island Headworks

Elected National Vice President of NAGE out of 45,000 members

Member of NAGE Budget Committee

Wastewater Operations

September 2019



STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Appointment of Manager, IT Security, Architecture and Engineering,
Management Information Systems, Administration



COMMITTEE: Personnel and Compensation

 INFORMATION

 X VOTE

Andrea Murphy, Director, Human Resources
Preparer/Title


Michele S. Gillen
Director of Administration

RECOMMENDATION:

To approve the appointment of Mr. Murali Rajoo to the position of Manager, IT Security, Architecture and Engineering (Non-Union, Grade 14), at an annual salary of \$137,000, commencing on a date to be determined by the Executive Director.

DISCUSSION:

The position of Manager, IT Security, Architecture and Engineering became vacant upon the promotion of the incumbent. The Manager IT Security, Architecture and Engineering oversees the development and implementation of the Information Security Program, IT Asset and Configuration Management Program, IT Technical Reference Model and Application, Data Base, and Infrastructure Designs. This position is responsible for developing, recommending and implementing information technology policies, standards, architectural patterns and designs associated with the Authority's applications and the platforms on which they run. The Manager is also responsible for the development, recommendation and implementation of cyber security policies, standards and security design reviews associated with all MWRA applications and platforms as well as oversight of the managed security services program.

Selection Process

This position was posted both internally and externally. A total of 24 candidates applied. Two internal and seven external candidates were determined to be qualified and were referred for an interview. One external candidate withdrew from the process prior to the interviews. The Director of Environmental Quality, the Special Assistant for Affirmative Action and the Director of MIS conducted the interviews. Upon completion of the interviews, Mr. Rajoo was determined to be the best candidate based on his experience, knowledge, skills and education.

Mr. Rajoo has over 20 years of experience in information technology. For the past eight years Mr. Rajoo has been serving as the IT Infrastructure Cloud Architect for Hancock Natural Resource Group where he is responsible for the planning, design and implementation of IT solutions and has led many significant projects including the merger and systems migration resulting from a company acquisition. Mr. Rajoo is responsible for the supervision of junior systems engineers and has experience managing VMware environments, Active Directory, Exchange, CommVault, software packaging and security technologies such as firewalls, VPN and web filtering.

Prior to his role at Hancock Natural Resource Group, Mr. Rajoo was an SMS/Systems Administrator for Analogic where he was responsible for software deployment, security, and imaging. He previously held the position of Helpdesk Analyst and Senior Analyst where he managed the Helpdesk and associated Service Level Agreements.

Mr. Rajoo possesses a Bachelor of Science in Business Information Systems from the University of East London, London, UK.

Based on his experience managing complex technical solutions for a variety of industries, his experience with many technologies currently implemented at the MWRA and his ability to manage technical staff to successful solution implementations, Mr. Rajoo is recommended for the position of Manager, IT Security, Architecture and Engineering.

BUDGET/FISCAL IMPACT:

Sufficient funds are included in the FY20 CEB for this position.

ATTACHMENTS:

Resume of Murali Rajoo
Position Description
MIS Organization Chart

MURALI RAJOO

EXPERIENCE

Hancock Natural Resource Group,

Boston, MA

IT Infrastructure Cloud Architect (07/11 – Now)

Plan, Design and Implement IT Solutions. Provide knowledge transfer and training on new technologies. The “go-to guy” for many complex technical problems and provide methodical approach in troubleshooting and testing. Supervise junior systems engineer by delegating IT project tasks.

OBJECTIVE

- To build a long-term career with opportunities to growth
- To enhance my knowledge and technical skills
- To solve technical challenges in more creative and effective manner
- To work in a stable environment that offers opportunities to learn and implement new technologies for business growth
- To work as a team at all levels to accomplish IT goals and objectives
- To bring my strong sense of dedication, motivation and responsibility to complete IT related projects in timely and cost effective manner

- Azure Cloud Tenant and IaaS Administration and Management
- Cloud Architecture design and implementation on various projects
- Cloud Integration for SaaS, PaaS and IaaS (hybrid and fully cloud)
- Work with Cloud providers on Proof of Concepts and alternative solutions
- VMware Administration and Management
- PowerShell, Visual Basic and Batch Scripting
- Office365 Tenant Administration and Management
- SCCM 2012 OSD, Security, Reports, Inventory and Patch Management
- Intune MDM Administration and Management
- Commvault Backup/Restore, Archiving and Cloud Reporting
- FootPrints Helpdesk Service and Asset Core Administration
- Vendor license and contract negotiation
- Active Directory Administration and Management
- Basic Network Administration

Analogic Corporation

Peabody, MA

SMS/Systems Administrator (02/05 – 3/11)

Joined as a Helpdesk Analyst but promoted to Senior Helpdesk Analyst and then SMS/Systems Administrator. Managed a group of Helpdesk Analysts (4) and the daily operations of Helpdesk Systems in compliance with SLA. Responsible for the Desktop security (2000 Computers), Inventory, Imaging, Packaging and Software updates. Provided Tools and Techniques to Helpdesk Analysts to simplify their daily tasks.

SKILLS & ABILITIES

- Project Management
- Helpdesk Management
- Azure Cloud IaaS, SaaS & PaaS
- Office365 Management
- Systems Administration
- Systems Engineering
- Security Administration
- Vendor Management
- Research and Development

- Create, Test and deploy packages via SMS
- Manage Teams/Projects SharePoint sites
- Generate logs/alerts through RSA envision
- VPN and Load Balancing through Citrix SSL VPN/NetScaler
- Data Loss Prevention (DLP) Policy settings
- BlueCoat reports/dashboard generation
- Generate/renew Verisign SSL Certificate
- Desktop Imaging through BDD2007/ MDT2008
- Assign priority tickets to Technicians
- Level II&III support on hardware and software
- Supervise and support other team members
- Participate in meetings and discussion

MURALI RAJOO
Conquest Business Media, Inc.
Beverly, MA
Systems Administrator (01/03 - 10/04)

Joined this small company (30 users) as a single IT person and managed all aspects of technical environments. Ensured all IT procedures are met, approved and performed according to standard guidelines.

- LAN/WAN Administration
- User and Email Account setup
- Technical Support
- Follow IT policies and procedures
- Setup and Configure hardware
- Network & Firewall Administration
- Evaluate Hardware and Software
- Telephone systems administration
- Vendor & Inventory Management

Breakaway Solutions
Waltham, MA
Lead Operations Engineer (06/00 - 08/01)

Joined as an Operations Technician in a Data Center environment but promoted to Lead Operations Engineer. Responsible for all Servers backup/restore (300) and monitor the Servers hardware performance and log events. Assisted Data Center planning, upgrade and downsize.

- Provide leadership and direction
- Data Center Planning and Administration
- Follow/update Operating procedures
- Production servers backup/archive/restore Administration
- Monitor systems uptime and availability
- Maintain backup logs and off-site storage
- On-Call 24x7 for any backup related issues
- Supervise and train junior Operation Technicians
- Work with Vendors on major hardware failures
- Technical Support via phone, trouble tickets and e-mails

European Commission
London, UK
Systems Administrator (09/97 - 03/00)

Joined as a two person IT Team and provided helpdesk support for the local and remote users. Maintained Database records and manipulate the data into readable reports. Constantly update Internet and Intranet web pages.

- Helpdesk Support via phone, e-mail and in person
- European Union Database Administration
- Reports Generation
- Troubleshoot Hardware and Software
- Internal and External Website development

EDUCATION

University of East London, London, UK
1996 – B.Sc. (Hons) Business Information Systems.

TRAINING

- 2017 – Implementing Microsoft Azure Infrastructure Solutions Master Class
- 2017 - HNRG Employee Leadership Training – Tier 2
- 2015 - Managing Office 365 Identities and Services
- 2015 – Commvault Implementation and Maintenance
- 2015 - BMC FootPrints Service Core v12.x Boot Camp
- 2015 - HNRG Employee Leadership Training
- 2014 - Horizon (with View): Install, Configure, and Manage V6.0]
- 2014 - UCS Implementation and Design Lab Camp 5.0
- 2014 - IT Project Management
- 2006 - SMS 2003 Administration
- 2001 - Certificate of Completion in MS SQL Server 7.0: Setup & Security
- 2001 - Certificate of Completion in Unix Systems Administration II
- 2000 - Certificate of Completion in Unix Systems Administration I

**MWRA
POSITION DESCRIPTION**

POSITION: Manager, Information Technology Security, Architecture & Engineering

PCR#:

DIVISION: Administration

DEPARTMENT: Management Information Systems (MIS)

BASIC PURPOSE:

Plans, directs, and oversees the operations and budget of the Information Technology (IT) Security, Architecture & Engineering section. Plans and maintains work systems, procedures, and policies that enable and encourage the optimum performance of assigned staff and other IT resources. Oversees the development, implementation, deployment and operation of information systems and technology solutions to meet business and operational needs across the organization.

SUPERVISION RECEIVED:

Works under the general supervision of the Deputy Director of MIS.

SUPERVISION EXERCISED:

Manages IT professional, technical and administrative employees assigned to the IT Security, Architecture & Engineering section.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Provides oversight and direction to the employees in the operating section in accordance with the organization's policies and procedures. Identifies needed improvements to work practices and works with the Deputy Director of MIS, the Director, MIS, and Labor Relations staff to bring about changes.
- Manages the preparation and maintenance of reports necessary to carry out the functions of the department. Prepares periodic reports for management, as necessary or requested, to track strategic goal accomplishment.
- Develops and implements an enterprise technical reference model. Responsible for the establishment of technical standards associated with information technology domains required to implement the Authority's systems.
- Responsible for information technology architecture and engineering activities. Ensures that technical blue prints for specific IT solutions are provided.

- Responsible for the development and maintenance of data architecture models, policies and standards that govern which data are collected, and how it is stored, arranged, integrated, and put to use in data systems and in organizations.
- Responsible for the development and maintenance of the policies, standards and procedures associated with the Information Security Program.
- Responsible for the scope, schedule and budget for information technology projects within the unit.
- Develops and manages project plan schedules, assigned resources, and associated costs.
- Responsible for the development and maintenance of the IT Asset and Configuration Management Program including policies, standards and procedures to ensure that assets are identified, controlled, and managed.
- Oversees capacity management. Responsible to ensure that cost-justifiable system capacity is available to meet current and future business needs.
- Oversees technical problem management. Responsible for developing and managing the lifecycle of all problems from identification to removal.
- Estimates the financial impact of technical architecture alternatives as required. Manages expenses to section budget.
- Responsible for the development and management of the IT change management process to ensure that all changes are prioritized, planned, tested, implemented, documented, and reviewed in a controlled manner.
- Provides final recommendation on staffing levels. Works with Human Resources staff to recruit, interview, select, hire, and employ an appropriate number of employees.
- Mentors and develops staff, including overseeing new employee on-boarding and providing career development planning and opportunities. Encourages employees to take responsibility for their jobs and goals. Delegates responsibility as appropriate and expects accountability and regular feedback.
- Fosters a spirit of teamwork that allows for disagreement over ideas, conflict and conflict resolution, as well as the appreciation of diversity. Communicates organizational information through department meetings, one-on-one meetings, and appropriate email, and regular interpersonal communication.
- Leads employees using a performance management and development process that provides an overall context and framework to encourage employee contribution and includes goal setting, feedback, and performance development planning. Leads employees to meet the organization's expectations for productivity, quality, and goal accomplishment.
- Maintains employee work schedules including assignments, job rotation, training, vacations and approved leaves. Provides coverage for absenteeism, and overtime scheduling as needed.

- Assist in maintaining harmonious labor management relations through proper applications of collective bargaining agreement provisions and established personnel policies.
- Prepare for and hears Step-One grievances and pre-disciplinary hearings.
- Participate in collective bargaining negotiations.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A Bachelor's degree in computer science, information technology or related field is required. Advance degree preferred; and
- (B) Eight (8) to ten (10) years of experience in IT architecture, engineering and security of which 4 years must be in a supervisory or managerial capacity overseeing an IT multi-discipline functional section; or
- (C) Any equivalent combination of education and experience.

Necessary Knowledge, Skills and Abilities:

- (A) Excellent analytical and technical skills.
- (B) Excellent written and verbal communication skills.
- (C) Exceptional interpersonal skills in areas such as teamwork, facilitation and negotiation.
- (D) Excellent planning and organizational skills.
- (E) Strong leadership skills.
- (F) Knowledge of all components of a technical architecture; understanding of network architecture, service oriented architecture and object-oriented analysis and design.
- (G) Skill with CSS, HTML, one or more JavaScript frameworks, and AJAX, Microsoft's .Net framework

SPECIAL REQUIREMENTS

- ITIL Foundation Certification in IT Service Management version 3 or 4; and
- Master Project Manager certification (American Academy of Project Management) or Project Management Professional (PMP) or equivalent or the ability to obtain within six months; and

- At least two certifications from the following list or the ability to obtain within one year:
- ITIL Intermediate Module - Release, Control, and Validation
- MCSE - Microsoft Certified Solution Expert
- MCSA - Microsoft Certified Solution Developer
- CISM - Certified Information Security Manager
- CISSP - Certified Information Systems Security Professional
- VCP5-DCV: VMware Certified Professional 5 - Data Center Virtualization
- Cisco CCIE - Cisco Certified Internetwork Expert
- CCP - Citrix Certified Professional

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone, personal computers including word processing and other software, copy and fax machines.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform essential functions.

While performing the duties of this job, the employee is regularly required to use hands to finger, handle, feel or operate objects, tools or controls and reach with hands and arms. The employee frequently is required to sit and talk or hear. The employee is occasionally required to walk and stand.

The employee must occasionally lift and/or move up to 10 pounds. Specific vision abilities required by this job include close vision and color vision, and the ability to adjust focus.

WORK ENVIRONMENT:

The work characteristics described here are representative of those an employee encounters while performing the essential functions of this job.

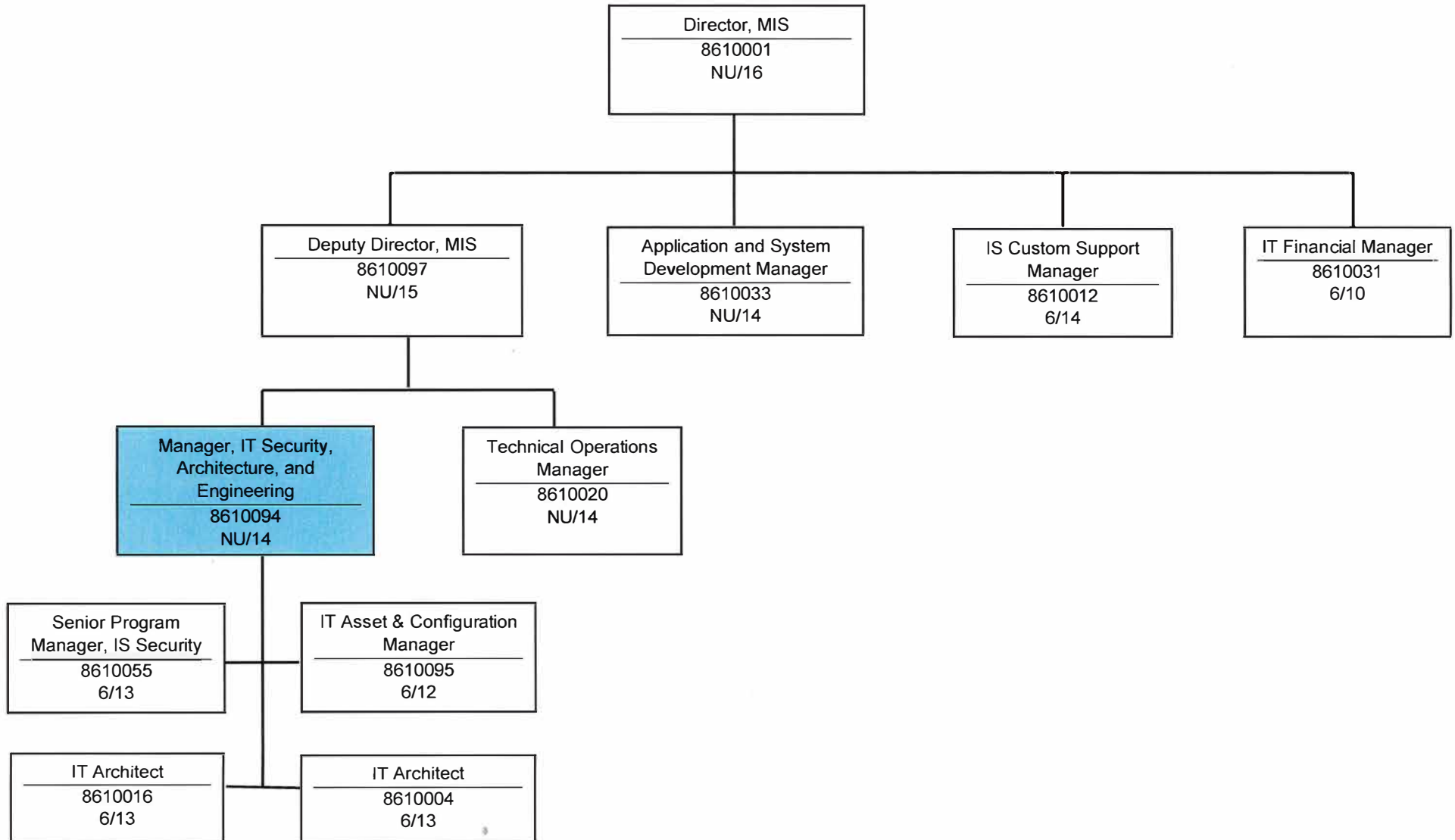
The noise level in the normal work environment is quiet.

March 2019


Administration Division

MIS Department

September 2019



STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: September 18, 2019
SUBJECT: Appointment of Communications Manager, Metropolitan Tunnel Redundancy Program

COMMITTEE: Personnel and Compensation

X VOTE
_____ INFORMATION

Ria Convery, Special Asst. to the Executive Director
Kathleen M. Murtagh, P.E., Director, Tunnel Redundancy
Andrea Murphy, Director, Human Resources
Preparer/Title


Michele S. Gillen
Director, Administration

RECOMMENDATION:

To approve the appointment of Ms. Kristin MacDougall to the position of Communications Manager, Metropolitan Tunnel Redundancy Program (Unit 6, Grade 12) at an annual salary of \$99,150.71, commencing on a date to be determined by the Executive Director.

DISCUSSION:

This new position was approved by the Board in May 2019 and reports to the Special Assistant to the Executive Director, working closely with the Director of Tunnel Redundancy. The purpose of this position is to manage the Communications Plan for the Metropolitan Tunnel Redundancy Program, which is being designed to maintain support of the project from ratepayers, elected officials, regulators and industry associations. This position will develop and manage web pages and social media accounts, fact sheets, newsletters and other publications to provide ongoing updates to the public as the Program progresses. This position will coordinate responses to the public and media, and work closely with the contractors on the Program to ensure the consistent delivery of information. This position will also assist with presentation materials for the Board and provide assistance to Tunnel Redundancy staff and other senior managers. It will also assist with the development and preparation of performance indicators for the Orange Notebook.

This position was posted internally and of the two internal candidates, one candidate was referred. The candidate was interviewed by the Director of Tunnel Redundancy and the Special Assistant to the Executive Director. Kristin MacDougall was determined to be well qualified based on her knowledge, experience, technical skills and education.

Ms. MacDougall has been at the MWRA for over 25 years, with over 22 years working in the Communications Unit. Early in her career, she worked with the MetroWest Water Supply Tunnel team providing administrative support. Since 2000, she has been responsible for MWRA's website, www.mwra.com, which requires excellent writing, editing and technical skills. She has extensive experience preparing press releases, fact sheets and other presentation materials. She routinely

responds to requests from the public on a variety of topics. For the last year and a half, she has been working as the Assistant to the Board of Directors, in addition to her other duties, which requires excellent organizational and prioritization skills.

Ms. MacDougall has proven herself to be an invaluable member of the Communications team and is well-respected across the agency. Ms. MacDougall holds a Bachelor's Degree from Oberlin College and a Master's in Public Administration Degree from UMass Boston.

BUDGET/FISCAL IMPACT:

There are sufficient funds in the FY2020 Current Expense Budget for this position.

ATTACHMENTS:

Resume of Kristin MacDougall
Position Description
Public Affairs Organizational Chart

Kristin MacDougall

Education and Training

MPA – Gender, Leadership and Public Policy, UMass Boston, 2019

BA – Oberlin College, Oberlin OH, 1992

Massachusetts Emergency Management Agency (MEMA) Public Information Officer I Training, 2015

Web Development and Graphic Design Courses, Massachusetts College of Art, 2001-2005

Professional Experience

April 2018-Present

Temporary Assistant to the MWRA Board of Directors, Executive Office

Massachusetts Water Resources Authority (MWRA), Boston, MA

- Coordinate the production and distribution of hardcopy and online Board of Directors meeting materials, agendas, minutes and vote extracts.
- Take minutes of Board of Directors and Committee meetings.
- Maintain official hardcopy and database records of Board of Directors meeting materials and correspondence; fulfill document retrieval requests.
- Coordinate Board member swearing in ceremonies with the Governor's office.
- Serve as MWRA liaison between members of the Board of Directors and senior management.
- Provide administrative and logistical support to the Board of Directors as needed.

August 2000-Present

Communications Specialist/Project Coordinator, Public Affairs (Title/Grade Change)

Massachusetts Water Resources Authority (MWRA), Boston, MA

- Write, edit, lay out and distribute press releases, web content, reports, newsletters, presentations and educational materials.
- Maintain the MWRA web site and social media accounts, serve as backup on Pipeline postings.
- Respond to and log general questions and requests for information from the constituents, the press and public officials.
- Assist the Communications Director and act in her absence, as needed.
- Provide web site, public information and emergency notification support in the MWRA Emergency Operations Center during emergencies such as boil water orders, large pipe breaks or storms.
- Represent MWRA at public events and assist in their planning and coordination as needed.

November 1997-August 2000

Communications Coordinator, Public Affairs

Massachusetts Water Resources Authority (MWRA), Boston, MA

- Wrote, edited, laid out and distributed press releases, reports, newsletters, briefing books and educational materials.
- Represented MWRA at public events and assisted in their planning and coordination as needed.

February 1996-November 1997

Secretary I, Engineering and Construction Department, Waterworks Division

Massachusetts Water Resources Authority (MWRA), Boston, MA

- Provided administrative support for MWRA's Water Engineering and Construction project teams.
- Projects included MetroWest Water Supply Tunnel, Walnut Hill Water Treatment Plant and the Norumbega/Loring Road/Fells Covered Storage Tanks.

February 1994-November 1997

Secretary II, Engineering and Construction Department, Sewerage Division

Massachusetts Water Resources Authority (MWRA), Boston, MA

- Provided administrative support for MWRA's Wastewater Engineering and Construction project teams.
- Projects included Quincy Pump Stations, Braintree-Weymouth Relief Facilities and the North Metropolitan Trunk Sewer.

August 1992-February 1994

Secretary (Temporary, Full Time)

Massachusetts Water Resources Authority (MWRA), Boston, MA

- Provided full time, temporary administrative support for MWRA's Sewer Engineering and Construction Departments, including CSO Control, Construction, Engineering, Engineering and Construction and GIS Departments.

Volunteer Work

2018-Present

President

The Footlight Club, America's Oldest Community Theater, Jamaica Plain, MA

- Lead a 13-member, elected Board of Directors and subcommittees to oversee all operations for a 501 (c)(3) not-for-profit theater including budgets, finances, artistic programming, staffing, technical assets, safety and security, fundraising/development, endowment, community outreach, membership, ticket sales, publicity, facilities and restoration/upkeep of historic Eliot Hall (c. 1822).
- Work with team members to develop and enforce policies and procedures to promote efficient operations and the safety of all volunteers, staff and patrons.

Awards

Best Capstone, UMass Boston, MPA Class of 2019

"Stakeholder Perceptions of the Merrimack Valley Gas Explosions Crisis Response and Restoration Efforts"

**MWRA
POSITION DESCRIPTION**

POSITION: Communications Manager

PCR#:

DIVISION: Executive

DEPARTMENT: Tunnel Redundancy Department

BASIC PURPOSE:

Manages the communication program for the Metropolitan Tunnel Redundancy Program to keep various groups of interested parties and audiences informed throughout the entire project.

SUPERVISION RECEIVED:

Works under the general supervision of the Special Assistant to the Executive Director in coordination with the Director, Metropolitan Tunnel Redundancy Program.

SUPERVISION EXERCISED:

Exercises close supervision of intern(s) as required.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Manages the Communications Plan for the Metropolitan Tunnel Redundancy Program to maintain support of the project from ratepayers, elected officials, regulators and industry associations.
- Develops and manages web pages and social media accounts, fact sheets, newsletters, brochures and other publications for media or public distribution to provide ongoing project updates.
- Coordinates response to public and media inquiries about the Program. Prepares news releases and monitors the press for issues regarding the Program. Ensures consistent delivery of information.
- Coordinates meetings with and develops working relationships with relevant external constituent groups.
- Assists with the preparation of staff summaries and presentation materials for Board of Directors and MWRA Advisory Board meetings.

- Manages the preparation of public presentations, speeches, etc. for Tunnel Redundancy Department staff and other senior managers.
- Maintains photographic archive for the Program in accordance with existing agency standards.
- Reviews and edits documents for internal and external distribution.
- Coordinates special events.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) Analytical and writing skills as normally attained through a four (4) year college program in communications, public administration, journalism or a related field. A master's degree preferred; and
- (B) Understanding of media and community relations for a large public or governmental agency dealing with complicated issues as acquired through six (6) to eight (8) years of experience; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Proficiency with a variety of software applications including word processor, databases, spreadsheets, graphics, desktop publishing, HTML and multi-media.
- (B) Proficiency in production development including Internet/Intranet pages, automated programming, templates and macros.
- (C) Ability to work as an integral part of a multi-disciplined team (internal and external) on a complex, major civil works program
- (D) Excellent oral and written communications skills.
- (E) Knowledge of the principles and practices of graphic arts.

SPECIAL REQUIREMENTS:

None.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone, personal computers including word processing and other software, copy and fax machines, and digital camera.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential duties.

While performing the duties of this job, the employee is regularly required to sit, talk or hear. The employee is regularly required to use hands to finger, handle, feel or operate objects, including office equipment, or controls and reach with hands and arms. The employee frequently is required to stand and walk.

The employee must regularly lift and/or move up to 10 pounds. Specific vision abilities required by this job include close vision, color vision and the ability to adjust focus.

WORK ENVIRONMENT:

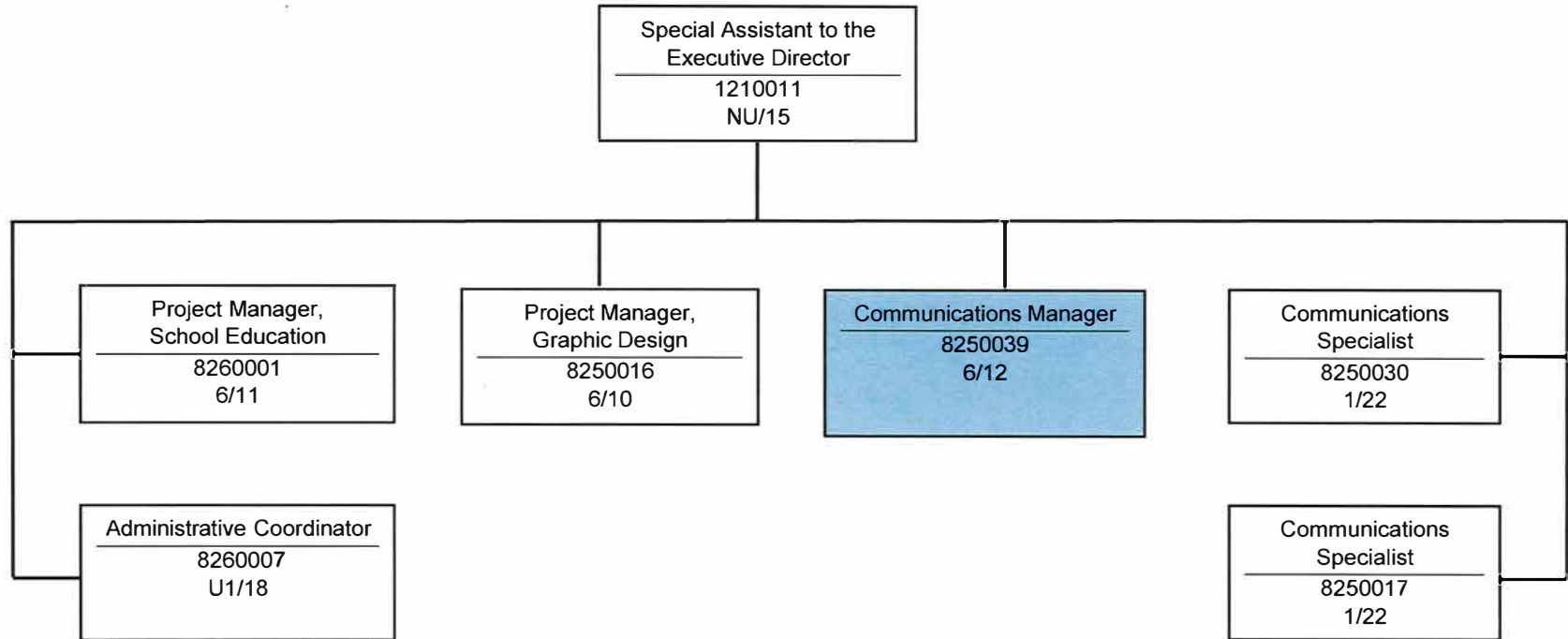
The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. While performing the duties of this job, the employee regularly works in an office environment.

The noise level in the work environment is usually a moderately quiet office setting.


April 2019

Executive Division
Public Affairs Department – Communications Unit


September 2019




STAFF SUMMARY

To: Board of Directors
From: Frederick A. Laskey, Executive Director 
Date: September 18, 2019
Subject: Appointment of Senior Staff Counsel for General Litigation

COMMITTEE: Personnel & Compensation

Andrea Murphy, Director, Human Resources
Meghan L. McNamara, Assoc. General Counsel
Preparer/Title 

 INFORMATION
 X VOTE

Michele S. Gillen
Director of Administration

RECOMMENDATION:

That the Board approve the appointment of Nicholas A. Ogden as Senior Staff Counsel, General Litigation, Law Division (Unit 6, Grade 13) at an annual salary of \$127,481.99, commencing on a date to be determined by the Executive Director.

DISCUSSION:

The position of Senior Staff Counsel became vacant upon the retirement of the incumbent. The position reports to the Associate General Counsel, Litigation and is responsible for representing the MWRA in both affirmative and defensive litigation efforts by the Authority, including cases which raise a myriad of legal issues in the areas of contract, public construction, real estate and administrative law.

Selection Process

This position was posted internally and externally. Forty-five applicants applied, of which seven qualified candidates were selected to be interviewed. The Director of the Affirmative Action and Compliance Unit, Associate General Counsel (Operations), and Associate General Counsel (Litigation) interviewed these candidates and unanimously selected three finalists for follow-up interviews with MWRA's General Counsel. Two of the three finalists participated in the second round of interviews; the third finalist withdrew her application. Upon completion of the interviews, Nicholas A. Ogden was selected as the best candidate for the position based upon his specific qualifications and experience.

Mr. Ogden is currently an Assistant Attorney General in the Trial Division of the Office of the Attorney General (OAG), where for the past eleven years he has represented the Commonwealth and its various agencies before the state and federal courts in disputes involving construction, public bidding, employment, eminent domain, civil rights and whistle blower actions. Mr. Ogden has managed all aspects of the litigation matters assigned to him and has obtained favorable verdicts for the Commonwealth in trials before both judges and juries. He has successfully briefed and argued appeals before the Appeals Court and Supreme Judicial Court. Mr. Ogden has also directly managed two very complex multi-state arbitrations against the tobacco industry,

which resulted in the release of \$32 million to the Commonwealth. Prior to joining the OAG, Mr. Ogden was a civil litigation associate at the firm of Donovan Hatem LLP for seven years, where he represented architects, engineers and other design professionals in matters involving construction claims, fee disputes, professional liability, and environmental clean-up actions, among others. Notably, Mr. Ogden represented the project manager and section design consultants in significant litigation arising out of the Central Artery/Tunnel Project. Mr. Ogden began his career at Schlesinger & Schlesinger LLP where he represented institutional clients in collections and subrogation matters in the district and superior courts.

Mr. Ogden has a Bachelor of Arts degree from Vassar College and a Juris Doctor from Boston University School of Law. He is a member in good standing of the Massachusetts Bar and is admitted to practice before the Massachusetts state and federal courts.

BUDGET/FISCAL IMPACT:

There are sufficient funds in the FY20 Current Expense Budget for this position.

ATTACHMENTS:

Resume of Nicholas A. Ogden
Position Description
Organizational Chart for Law Division

NICHOLAS A. OGDEN

PROFESSIONAL EXPERIENCE

COMMONWEALTH OF MASSACHUSETTS OFFICE OF THE ATTORNEY GENERAL *Boston, MA*
Assistant Attorney General (Trial Division, Government Bureau) August 2008 – Present

Represent the Commonwealth in construction, public bidding, contract, employment, tort, erroneous conviction, civil rights and whistleblower actions. Manage all aspects of case strategy including: drafting and arguing motions; taking and defending depositions; preparing expert witnesses; negotiating settlements; and trying cases. Successfully defended the Commonwealth in bid protest actions concerning construction, maintenance and transportation projects by defeating motions for preliminary injunctions and obtaining judgments in favor of the Commonwealth. Prevailed in two multi-state arbitrations against the tobacco industry, defeating claims for approximately \$500 million and won the release of \$32 million to the Commonwealth. Successfully argued appeals before the Supreme Judicial Court and Appeals Court.

SUFFOLK COUNTY DISTRICT ATTORNEY'S OFFICE *Boston, MA*
Special Assistant District Attorney September 2012 – February 2013

Managed prosecution of more than 150 criminal cases. Tried three jury trials that included charges for assault and battery, larceny and operating under the influence of drugs.

DONOVAN HATEM LLP *Boston, MA*
Associate March 2001 – July 2008

Defended architects, engineers, accountants, attorneys, real estate brokers, and financial advisors in civil actions concerning construction law, contract disputes, Massachusetts False Claim Act allegations, fee disputes, torts, state environmental clean-up actions and professional malpractice. Managed all aspects of case strategy including: drafting and arguing dispositive motions; taking and defending depositions; preparing fact and expert witnesses; and mediating cases. Represented the project manager and section design consultants in tort, contract, and false claim actions arising out of the Central Artery/Tunnel Project, including drafting memoranda analyzing the false claims allegations, and managing significant paper and electronic discovery.

SCHLESINGER & SCHLESINGER, LLP *Boston, MA*
Associate 2000 – March 2001

Prosecuted numerous collections and subrogation cases for institutional clients. Prepared and argued motions, attachments and petitions for receivership before district and superior courts. Negotiated settlements and attended mediations. Conducted depositions. Responded to discovery requests.

EDUCATION

BOSTON UNIVERSITY SCHOOL OF LAW, J.D., May 1999 *Boston, MA*
Concentrations in Business Finance and Organization; Litigation and Dispute Resolution
Jessup International Moot Court Team
Spencer R. Koch Memorial Award (for Alumni outreach)
Student Bar President and Permanent Class Officer

VASSAR COLLEGE, B.A. in Music, May 1996 *Poughkeepsie, NY*
Minors in Russian Language; European History

BAR ADMISSIONS

Admitted to practice in Massachusetts, New York, United States Courts of Appeals for the First Circuit and the United States District Court for the District of Massachusetts.

**MWRA
POSITION DESCRIPTION**

POSITION: Senior Staff Counsel (General Litigation)

DIVISION: Law

DEPARTMENT: Law

BASIC PURPOSE:

Provides legal analysis, advice, and representation of the Authority as requested by the General Counsel and Associate General Counsel.

SUPERVISION RECEIVED:

Works under the general supervision of General Counsel or an Associate General Counsel as assigned.

SUPERVISION EXERCISED:

Exercises close supervision of a legal assistant and support staff.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Acts as litigation counsel. Represents the Authority at all stages of litigation before state and federal courts and in administrative and arbitration proceedings.
- Handles substantive and procedural legal matters in the following areas: construction, real estate, contracts, administrative, arbitration, and litigation.
- Research and determines the applicability of federal, state and local laws, regulations, and case law.
- Drafts and analyzes pleadings, motions, briefs, legal documents, claim documents, contract documents and memoranda.
- Develops and drafts rules, regulations, policies and procedures.
- Construes and applies the Authority's enabling statute and regulations.
- Analyzes and drafts legislation.

- Conducts legal research as required.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) Analytical and writing skills as normally attained through a Bachelor's degree; and
- (B) J.D. from an accredited law school; and
- (C) A minimum of three (3) to six (6) years as an attorney in the field of construction, real estate, and/or contracts; and
- (D) Admittance in good standing to the bar to practice law in Massachusetts state and federal courts; or
- (E) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Understanding of construction, real estate, contracts, and/or administrative law. Experience representing clients in litigation, administrative proceedings and arbitrations. Experience drafting and analyzing legal documents, claim documents, contract documents, memoranda, legislation and regulations.
- (B) Strong analytical, research, organizational, and oral and written communications skills.

SPECIAL REQUIREMENTS:

Massachusetts Bar License. (State bar admission must be obtained as of date of hire. Federal bar admission must be obtained no later than 6 months after hire.)

A valid Massachusetts Class D Driver's License

TOOLS AND EQUIPMENT USED:

Office machines as normally associated, with the use of telephone, personal computer including word processing and other software, copy and fax machine.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to sit, talk or hear. The employee is regularly required to use hands to finger, handle, feel or operate objects, including office equipment, or controls and reach with hands and arms. The employee frequently is required to stand and walk.

There are no requirements that weight be lifted or force be exerted in the performance of this job. Specific vision abilities required by this job include close vision, and the ability to adjust focus.

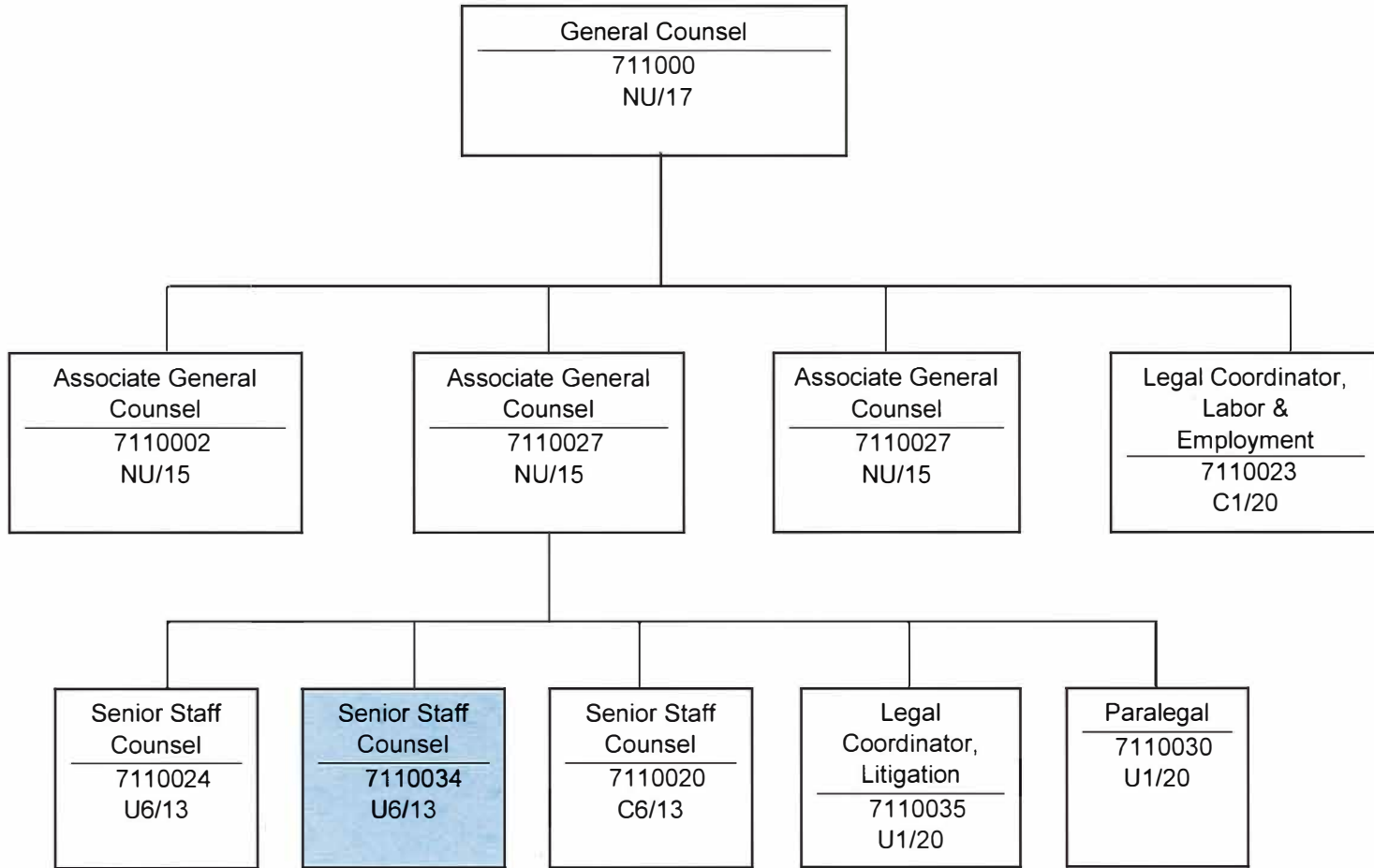
WORK ENVIRONMENT:

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. While performing the duties of this job, the employee regularly works in an office environment.

The noise level in the work environment is usually a moderately quiet office setting.

June 2019

**Law Division
September 2019**



STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Pay Equity Consulting Services
Hirsch Roberts Weinstein LLP
Contract A616, Amendment 1



COMMITTEE: Personnel & Compensation

 INFORMATION
 X VOTE

Robert Donnelly, Manager, Operations Support
Andrea Murphy, Director, Human Resources
Patterson Riley, Special Assistant for Affirmative Action
Preparer/Title



Michele S. Gillen
Director, Administration

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to approve Amendment 1 to Contract A616, Pay Equity Consulting Services with Hirsch Roberts Weinstein LLP, to increase the contract not to exceed amount by \$113,250 from \$27,575 to \$141,400 and to extend the contract term by 730 calendar days from July 9, 2019 to July 9, 2021.

DISCUSSION:

Effective on July 1, 2018, the Massachusetts Pay Equity Act M.G.L. c. 149, §105A (MEPA) was amended to add clarity to what constitutes unlawful wage discrimination on the basis of gender. Generally, MEPA provides that no employer shall discriminate in any way on the basis of gender in the payment of wages, or pay any person in its employ a salary or wage rate less than the rates paid to its employees of a different gender for comparable work. "Comparable work" is defined as work that requires "substantially similar" skill, effort, and responsibility and is performed under similar working conditions.

MEPA provides an affirmative defense to liability for employers if, within the previous three years and prior to the commencement of the employee action, the employer has completed a good faith self-evaluation of its pay practices and has demonstrated that reasonable progress has been made toward eliminating any wage differentials potentially based on gender identified by the self-evaluation. In July 2018, after a competitive bidding process, MWRA contracted with the law firm of Hirsch Roberts Weinstein. The purpose of this contract was to assist with performing a "self-evaluation" on its compensation to non-union employees. That initiative was completed and recommendations were presented and approved by the Board on March 20, 2019.

With the completion of the pay equity self-evaluation of non-union employees, staff now recommend expanding the self-evaluation process to include MWRA's five collective bargaining units. Currently, there are approximately 1,100 MWRA employees represented by collective bargaining units.

Similar to the services provided by Hirsch Roberts Weinstein for the non-union self-evaluation, the work under Amendment 1 will also include collecting employee compensation data, analyzing employee pay and recommending adjustments in pay practices to remediate any gender-based pay differentials, if appropriate. Hirsch Roberts Weinstein will also provide legal assistance and counsel regarding the law's application to employees represented by a collective bargaining unit. Finally, the Consultant will identify specific recommended changes and/or enhancements in MWRA policies, programs and practices that may prevent unjustified pay differentials in the future.

The same consultant staff that were engaged in the earlier work will also provide the services in Amendment 1. The contract includes expected hourly rate increases of 3% in 2020 and 2021. The hourly rates remain competitive in comparison to other providers of pay equity-related consultancy services.

During the original engagement, staff found the services provided by Hirsch Roberts Weinstein to be exceptional. In addition to providing necessary legal expertise regarding compliance with MEPA, Hirsch Roberts Weinstein included in its work plan the services of a compensation expert who performed excellent guidance and facilitation to the MWRA project team. The compensation expert also provided the tools needed to perform a quality self-evaluation of non-union compensation. Staff found this combination of expertise to be of value.

CONTRACT SUMMARY:

	<u>Amount</u>	<u>Time</u>	<u>Dated</u>
Original Contract	\$27,575	12 months	July 9, 2018
Amendment 1	<u>\$113,250</u>	<u>24 Months</u>	<u>Pending</u>
Adjusted Contract:	\$141,400		

BUDGET/FISCAL IMPACTS:

The FY2020 Current Expense Budget includes sufficient funds for this amendment. The FY2021 CEB will include a budget for anticipated FY2021 expenses under this contract.

MBE/WBE PARTICIPATION:

There were no MBE/WBE participation requirements established for this contract due to the limited opportunities for subcontracting.



MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

ADMINISTRATION, FINANCE & AUDIT COMMITTEE MEETING

to be held on

Wednesday, September 18, 2019

Chair: H. Vitale
Vice-Chair: J. Foti
Committee Members:
J. Carroll
C. Cook
K. Cotter
A. Pappastergion
B. Peña
J. Walsh

Location: 100 First Avenue, 2nd Floor
Charlestown Navy Yard
Boston, MA 02129

Time: Immediately following P&C Committee

AGENDA

A. Information

1. Internal Audit Department Activities Report – FY2019
2. FY2016-FY2020 Strategic Business Plan: Annual Update for FY2019
3. Fourth Quarter FY2019 Orange Notebook
4. Delegated Authority Report – July and August 2019
5. FY19 Year-End Capital Improvement Program Spending Report
6. FY19 Year-End Financial Update and Summary

B. Approvals

1. Bond Defeasance of Future Debt Service
2. Approval of the Eighty-first Supplemental Resolution

C. Contract Awards

1. Purchase of Vehicles: Liberty Chevrolet, Inc. and Colonial Ford, Inc., Bid WRA-4726

D. Contract Amendments/Change Orders

1. Dental Insurance: Delta Dental of Massachusetts, Contract A613, Amendment 2

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the

Administration, Finance and Audit Committee

July 17, 2019

A meeting of the Administration, Finance and Audit Committee was held on July 17, 2019 at the Authority headquarters in Charlestown. Committee Chair Vitale presided. Present from the Board were Messrs. Carroll, Cotter, Flanagan, Pappastergion, Peña and Walsh. Ms. Wolowicz and Messrs. Cook and Foti were absent. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, Thomas Durkin, Michele Gillen, Douglas Rice, Russell Murray and Kristin MacDougall. The meeting was called to order at 12:17 p.m.

Information

Delegated Authority Report – June 2019


There were questions and answers.

Other Business

Mr. Vitale thanked and commended MWRA staff for providing a portable water fountain for a recent City of Boston event. There was general discussion.


The meeting adjourned at 12:25 p.m.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: September 18, 2019
SUBJECT: Internal Audit Department Activities Report – FY2019

COMMITTEE: Administration, Finance & Audit

INFORMATION
 VOTE


Brian A. Rozowsky, Director, Internal Audit
Preparer/Title

RECOMMENDATION:

For information only. Internal Audit presents annually to the Board the results of completed assignments and the status of active and planned assignments. Every quarter, Internal Audit utilizes the Orange Notebook to briefly discuss recently issued reports and to report on the status of open audit recommendations and cost savings. This Staff Summary includes a discussion of activities since Internal Audit's last report to the Board in November 2018.

DISCUSSION:

In FY2019, a total dollar savings of \$3.6 million was recognized from 48 assignments, including internal audits, management advisory services, consultant incurred cost audits, consultant preliminary reviews, construction labor burden reviews, the true-up and review of HEEC billings and costs of the new cable, and contract negotiation support.

Internal Audit's goal is to provide sufficient audit coverage to give reasonable assurance that internal management controls are functioning as intended and that only reasonable, allowable and allocable costs are paid to consultants, contractors and vendors. Audit coverage is provided through performance audits that analyze and evaluate MWRA programs and activities to determine if they are being carried out effectively and efficiently, compliance audits that focus on adherence to MWRA policies and procedures, contractual requirements, rules or regulations and management advisory services.

The development of the Annual Audit Plan is based on Internal Audit's risk assessment of program and management controls, as well as input from MWRA senior managers and the Advisory Board. The actual scheduling and completion of audit assignments depend on staff availability, which can be impacted by control issues needing immediate attention or by unscheduled special requests for management advisory services.

Attachment 1 lists assignments completed since Internal Audit's last report to the Board, assignments currently in process and additional assignments planned to commence in FY2020.

INTERNAL AUDITS AND MANAGEMENT ADVISORY SERVICES

Purchase Card Program

The MWRA uses Purchase Cards to obtain and pay for non-inventory materials, supplies and equipment up to \$500 per transaction. During the audit period, 101 Purchase Cards were available for use by authorized Cardholders.

The objective of the audit was to determine compliance with the Authority's policies and procedures, which are contained in the Cardholder User Manual. The scope included the review of goods and services purchased during the first quarter FY2019 that totaled approximately \$159,000.

Recommendations made include updating the Cardholder User Manual, submitting transaction records with signature by the approving official in a timely manner and expanding authorization requirements for specific expenses. Management has accepted the recommendations and, to date, has implemented ten of the eleven recommendations made.

Fuel Use and Mileage Tracking

MWRA is responsible for reporting passenger vehicle emissions data related to the new MassDEP regulations. The purpose of the regulations are to achieve CO₂ emissions reductions from passenger vehicles by establishing annually declining limits on Green House Gas emissions.

The objective of the audit was to determine the reasonableness and accuracy of base year data (CY2016). The scope included verifying the number of vehicles, odometer readings and the fuel consumed for each vehicle.

Recommendations made included the replacement of the existing fuel inventory management system (Gas Boy) with specifications to meet the new requirements for reporting and accumulating data, ensuring all applicable vehicles have been included in the data and retaining documentation of fuel consumption reports for each vehicle. Management has accepted the recommendations and, to date, has implemented four of the eight recommendations. A number of recommendations relate to the new fuel system that is in the process of being bid and awarded.

Unemployment Compensation

The Commonwealth of Massachusetts administers the unemployment insurance program. MWRA is billed monthly by the Department of Unemployment Assistance (DUA) for amounts paid to former workers.

Internal Audit routinely reviews the monthly claims, on behalf of Human Resources, and checks them for accuracy. During FY2018, MWRA paid a total of \$22,846 in unemployment claims. The overall unemployment effective rate based on payroll is 0.1%, which is a very low rate.

One claimant was overpaid \$13,718 in a prior period, but MWRA has not yet been reimbursed by DUA.

City of Cambridge CSO Financial Assistance Agreement

The City of Cambridge (Cambridge) entered into a Memorandum of Understanding (MOU) and Financial Assistance Agreement (FAA) with the MWRA to fund Combined Sewer Overflow (CSO) projects required by the Federal Court Order in the Boston Harbor Case. The MOU/FAA terminated on June 30, 2018.

Internal Audit conducts periodic reviews to validate that the payments to Cambridge have been deposited into an account from which withdrawals may be made for eligible design and construction costs, and staff time (known as force account charges).

In FY2019, a review of Cambridge's CY2016 and 2017 force account charges claimed was performed resulting in savings of \$169,345 due to reductions in actual hours worked, different pay rates and fringe benefits and a proportion of force account costs not being eligible for reimbursement.

Chelsea Lease Agreement

MWRA has a 30-year lease agreement for the Chelsea Facility that expires on May 31, 2032. The lease payment amount is based on a predetermined rental plus actual real estate taxes and insurances.

Internal Audit reviewed the lease rental payments for FY2018, which were correctly paid. Amounts for real estate taxes and insurances are deposited into separate escrow accounts to pay the expenses as they come due. The audit finding revealed that the balance in the real estate tax and insurance escrow accounts were considered excessive and \$78,480 is being reduced against future payments.

Charlestown Navy Yard Lease Agreement

MWRA has a 10-year lease agreement for the office space in the Charlestown Navy Yard that expires on May 31, 2023. The payment is based on a predetermined rental plus the increase over a base for both real estate taxes and operating expenses. In addition, MWRA reimburses the landlord for certain leasehold improvements.

Internal Audit reviewed the payments for CY2017 and CY2018 and real estate taxes for FY2018 and FY2019 to determine compliance with the terms of the agreement. Savings of \$13,106 were realized from a reduction in operating expenses and real estate taxes from the two audits.

Other Management Advisory Services

Annually, Internal Audit provides management advisory services that include calculating MWRA's fringe and indirect cost rates, verifying unemployment benefit calculations, and providing support and review services to the Fore River Railroad Corporation (FRRRC). Internal Audit also assisted the Affirmative Action Compliance Unit in compiling costs reported for MBE/WBE. One of Internal Audit's other responsibilities is to maintain the MWRA's Policies and Procedures and Signature Authority forms.

In FY2019, numerous other management advisory services were also performed by Internal Audit

that included the Bay State Fertilizer program, analyses of airline travel, sole source awards, pension cost comparison, change orders under \$25,000 and construction and professional service contracts cost estimates. Internal Audit also performed numerous vendor financial capability reviews and analyses in support of Procurement.

In FY2019, the annual savings resulting from internal audits and management advisory services (other than those mentioned above) totaled \$501,027.

CONTRACT AUDITS AND RELATED REVIEWS

In FY2019, savings of \$2,863,373 were recognized from the following contract audit and other related assignments:

Consultant Incurred Cost Audits

An incurred cost audit determines that billed labor costs are supported by the consultant's time reports and project cost records, other direct costs are supported by valid payments, final indirect costs have been calculated in accordance with the contract, and that final indirect cost rates have been properly applied to labor billings. The extent of fieldwork required to complete an assignment is based on a risk assessment that starts with an invoice analysis and a review of the consultant's annual Consultant Disclosure Statement (CDS) submittal. The fieldwork is usually conducted at the consultant's office, but may be reduced to a desk review to verify that costs billed were supported.

In FY2019, four incurred cost audits were completed with a total contract value of \$7 million. These comprise AECOM, Arcadis, Aztec Technologies and McGinley Kalsow. A total of \$41,869 was recovered.

Consultant Preliminary Reviews

When a new contract is awarded for more than \$1 million, Internal Audit performs a consultant preliminary review to determine that the proposed direct labor, indirect costs, other direct costs or multipliers/comprehensive hourly rates are supported. Internal Audit then notifies Procurement and the Project Manager of any issues, including any unsupported proposed costs that might be available for re-allocation to another cost element.

In FY2019, eleven consultant preliminary reviews were completed with a total value of \$40.2 million. A total of \$219,960 in unsupported proposed costs was identified for potential reallocation.

Consultant Disclosure Statements/ Annual Indirect Cost Rate Reviews

Internal Audit reviews and accepts provisional indirect cost rates proposed by consultants for billing both new and active contracts. Each professional service consultant is required annually to submit a Consultant Disclosure Statement (CDS) including an indirect cost rate for the firm's recently completed fiscal year. Internal Audit reviews and approves provisional indirect cost rates, which are reported to Project Managers and Procurement as a reference source for reviewing invoices and pricing contracts and amendments. During FY2019, 40 annual rate letters were sent to consultants following IA's review and approval.

Construction Labor Burden Rate Reviews

A construction labor burden rate review establishes provisional labor burden rates to be used in the pricing of future change orders. Typical adjustments to contractor proposed rates include applying effective versus statutory Federal and State unemployment tax rates, applying appropriate experience modifications and other adjustments to workers compensation rates, and determining the basis for general liability and umbrella insurances and bond premium.

In FY2019, ten construction labor burden rate reviews were completed for contracts with a total value of \$34.9 million. An estimated \$125,877 in cost savings may be achieved on future change orders.

Harbor Electric Energy Company (HEEC) 2018 True-Up and Billings – Existing Cable

The purpose of this assignment was to verify the capacity charge calculation and operations and maintenance (O&M) charges billed by HEEC under the terms of the Department of Public Utility (DPU) tariff for CY2018. The DPU tariff is based on a capacity charge calculation using a complex formula to determine the annual payment for the use of the cross-harbor cable. Included in the tariff are O&M charges that include labor, materials needed to maintain the cable, and insurance for the cable.

Internal Audit reviewed the O&M charges and the tariff computation prior to HEEC's filing with DPU. Savings of \$19,294 will be recognized from disallowed costs included in O&M charges. In addition, HEEC will reimburse MWRA \$217,953 as DPU has recently approved the tariff where the final 2018 tariff is lower than the amount paid, which was based on the preliminary tariff filing.

Harbor Electric Energy Company (HEEC) - New Cable

During construction of the new cross-harbor cable, Internal Audit has been periodically reviewing the costs incurred on the project. Certain costs incurred prior to the MOU were initially included by HEEC but are not allowed under the terms of the MOU. In addition, certain sales tax costs included in HEEC's records were not actually incurred and some costs were duplicated. Total cost adjustments to date are \$251,171.

As contemplated in the MOU, it was agreed that MWRA could pay for its share of the capital costs during construction (prior to project completion) in order to reduce the costs, including those costs associated with Allowance for Funds Used During Construction (AFUDC). As of the fiscal year end, MWRA has paid \$35 million. These payments reduce the AFUDC charge that HEEC is permitted to include in the total costs, resulting in future savings estimated at \$2.1 million.

Pelletizing Plant - NEFCo

Internal Audit conducted a review of the NEFCo contract for 2018 with the objective being to determine if the correct pricing was used to compute monthly charges for pelletizing, pricing of quantities in excess of the contracted amount and fee for capital work. All invoices were correctly priced and paid according to the contract terms.

In addition, a compilation of the financial results of NEFCo's operation of the MWRA pellet plant was prepared for MWRA management.

Amendment 2 to the contract was executed, after the collapse of the building to which piping to silos 6 to 9 was attached, following a claim for additional costs to be incurred by NEFCo. Internal Audit assisted staff in the amendment negotiations, validation of the claim and contract amendment.

Prevailing Wage Audit – S.J. Services

Certain MWRA contracts require contractors/vendors to pay their employees a prevailing wage rate that is stipulated in the contract depending on the location and nature of the work. Certified payroll reports document the contractors' representation of the prevailing wage rates actually paid. The prevailing wage rate includes the actual wages plus health and welfare and pension contributions paid by the contractor.

Internal Audit reviewed the two janitorial contracts with S.J. Services for Chelsea and Western Operations. A number of employees were found to have been paid less than the prevailing wage rates and S.J. Services was notified to correct the shortfall. In addition, there were many errors in the preparation of the certified payroll reports that will need to be correctly shown in future reports.

Instrumentation Systems Services - Apollo Safety

MWRA contracted with Apollo to provide calibration, repair, installation and troubleshooting of gas detection systems, instrument and process control systems and equipment.

Internal Audit reviewed the monthly invoices and supporting documentation to ensure they complied with the terms of the contract.

Recommendations made included MWRA signatures on arrival and departure times, overlaps in arrival and departure times, ineligible travel time, excessive travel on scheduled maintenance days and overpayments related to vendor receipts. All thirteen recommendations that were made have closed at the end of the fiscal year.

ATTACHMENT:

Status of Internal Audit Assignments FY2019 and FY2020

Status of Internal Audit Assignments FY2019 and FY2020

<u>COMPLETED</u>	<u>Date</u>	<u>IN PROCESS & PLANNED TO START IN FY2020</u>
<u>Internal Audit/Management Advisory Services</u>		
Cambridge FAA Force Account	Oct-18	Inventory Management Procedures
Unemployment Compensation	Oct-18	Purchasing
Vehicle Fuel Use & Mileage Tracking	Dec-18	Vendor Master File Review
Bay State Fertilizer	Feb-19	II/LPA Program
Purchase Cards	May-19	Fleet Data Verification
		Equipment Verification
<u>Reviews of Agreements and Contracts</u>		
Chelsea Lease 2017	Jul-18	Chelsea Lease 2018
CNY Lease 2017	Aug-18	HEEC 2019 True-up
Apollo	Mar-19	HEEC New Cable Costs and Tariff
HEEC 2018 True-up	May-19	CNY Lease 2019
NEFCo Financial Review	May-19	SJ Services Prevailing Wage - Clinton
CNY Lease 2018	May-19	
SJ Services Prevailing Wage - Chelsea, Western Ops	May-19	
NEFCo claim	Jun-19	
<u>Consultant Incurred Cost Audits</u>		
AECOM	Sep-18	Kleinfelder
Aztec Technologies	Dec-18	Stantec
Arcadis	Mar-19	Brown & Caldwell
McGinley Kalsow	Mar-19	Green International Affiliates
		SAR Engineering
<u>Consultant Preliminary Reviews (Over \$1 mill)</u>		
WASM/Spot Pond Pressure Valves (7575) \$2.8M	Jul-18	Combined Heat & Power (6963A) \$1.2M
JJCWTP Task Order (7543 & 7544) \$1M each	Aug-18	Section 22N Facility Plan/EIR (7155) \$2.9M
As Needed CA/REI (7498 & 7604) \$2.5M each	Aug-18	Section 53 & 99 Connections (7485) \$4.5M
Headworks/Shafts (7237) \$1.4M	Oct-18	Section 56 Saugus (7454) \$1.5M
As Needed REI (7629 & 7630) \$1.5M each	Jan-19	Deer Island Eastern Seawall (6723) \$1.2M
Braintree/Weymouth Improvements (7435) \$2.1M	Jan-19	Clarifier Rehabilitation Phase 2 (7397) \$3M
JJCWTP Scada (7581) \$4.7M	Mar-19	Siphon Structure (6224) \$1.6M
Inter High Water Pipeline Improve (6955) \$6.5M	Apr-19	DI South System VFD Replacement (7126) \$4.5M
Tunnel Redundancy Program Support (7655) \$10.2M	Jun-19	Steel Tanks Improvements (6832) \$3M
Chestnut Hill Emergency Pump Station (7574) \$2.1M	Jun-19	Waltham Water Pipeline (7547) \$3M
		Maintenance Garage, Washbay, Storage (7677) \$1M
		Hayes Pump Station Rehab (7462) \$1.5M
		Deer Island As Needed (7644,7645,7646) \$2.8M each
		Deer Island Fire Alarm (7426) \$2.1M
		Ward St & Columbus Park Headworks (7429) \$11.4M
		Deer Island HVAC (7094) \$2 M
		Metro Tunnel Redundancy (7159) \$16M
		Deer Island Hydro Turbine Replacement (7570) \$1.9M
		Technical Services (7644,7645,7646) \$1.8M each

Status of Internal Audit Assignments FY2019 and FY2020

<u>COMPLETED</u>	<u>Date</u>	<u>IN PROCESS & PLANNED TO START IN FY2020</u>
<u>Construction Labor Burden Rate Reviews (Over \$1 mill)</u>		
Deer Island Gravity Thickeners Rehab (7428) \$19.6M	Jul-18	Deer Island Chemical Tank & Digester Pipe (7373) \$8M
FRRRC Main Line Adjustment (FRR32) \$2.4M	Aug-18	Deer Island Gas Protection Replacement (7167) \$1M
Painting Bellevue 2 & Turkey Hill (7634) \$4M	Sep-18	Residuals Facilities Piping Relocation (7173) \$3.2M
Thermal & Hydro Power Plant (S578) \$8M	Dec-18	JJCWTP HVAC Equipment (7605) \$1.8M
Comm Ave Pump Station (7524) \$6.9M	Feb-19	Clinton Screw Valves & Pump (7372) \$2.5M
Deer Island Water Tank Painting (7601) \$2.6M	Apr-19	Dorchester Interceptor Sewer (7279) \$5.6M
Residuals Facilities Upgrade (7152) \$8.7M	May-19	Deer Island MCC & Switch Gear (7420) \$10.6M
		DI Clarifier Rehabilitation, Phase 2 (7395) \$135M
		Nut Island Odor Control/HVAC (7548) \$45M
		Deer Island Expansion Joint Repair 3 (6705) \$2M
		WASM3 New Connecting Mains CP3 (6392) \$14.3M
		Weston Aqueduct Sluice Gate (7369) \$1.1M
		CP1 Shafts 6,8,9A (7561) \$2.1M
		Prison Point Rehabilitation (7462) \$36.1M
		Fuel Oil Tank Replacement Ph 1 (7554) \$1.4M
		Wachusett Lower Gatehouse Pipe Replace (7380) \$2.6M
		Deer Island Fire Alarm (7051) \$25M
		Deer Island HVAC (7110) \$50.2M
		Bellevue 1 & Arlington Heights Masonry (7694) \$2.2M
		CP3 Shaft 5&9 (7671) \$2.5M
		Wachusett Lower Gatehouse Building Replace (7698) \$2.2M


STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: September 18, 2019
SUBJECT: FY16-FY20 Strategic Business Plan: Annual Update for FY19

COMMITTEE: Administration, Finance and Audit

INFORMATION
 VOTE

Carolyn M. Fiore, Deputy Chief Operating Officer
Denise Breitenicher, Program Manager, Energy and
Environmental Management
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

For information only. The current five-year business plan, covering FY16 through FY20, was presented to the Board in March 2015. The plan describes MWRA's mission, identifies values, and outlines five key strategic priorities and 18 goals, as well as specific initiatives associated with these goals, which provide a framework for MWRA's business initiatives over the next five years. The staff summary presents a review of the fourth year of MWRA's five-year business plan, including progress made on initiatives and accomplishments, and new issues that have been identified. MWRA has been developing and producing a business plan since December 1995.

DISCUSSION:

The FY16-FY20 MWRA Business Plan is a strategic blueprint that articulates the mission statement, values, and goals of the agency, as well as specific initiatives associated with these goals to be achieved or evaluated over the five-year period. The Plan was developed as a tool to guide staff in prioritizing projects and programs within the broader framework of MWRA goals and mandates, and to evaluate system-wide performance.

Five strategic themes integral to MWRA's mission form the basis of the Plan:

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

MWRA identified a series of goals to help it achieve its stated priorities, as well as core and special initiatives that describe the specific projects and direction MWRA intends to undertake over this five-year period. Core Initiatives address the activities that MWRA must do to meet its

performance goals, regulatory requirements and financial commitments. Special Initiatives address activities, projects and emerging issues that staff will be assessing or undertaking in order to improve MWRA's performance of its core responsibilities. Existing reporting mechanisms, such as the Orange and Yellow Notebooks, continue to be used to track monthly and quarterly performance.

The annual update allows MWRA to assess progress toward achievement of its goals as well as assess progress made on individual projects within Core Initiatives and on Special Initiatives. It also provides an opportunity for managers to review projects at a high level and decide whether the priority status of the project has changed (*i.e.*, more or less important) since the development of the current Business Plan, and whether the level of resources devoted to the project should remain the same or be increased or reduced.

The attached document presents all the goals by priority areas with the associated initiatives. There is a graphic that shows progress made in FY19, and an associated list of highlights for each initiative. Some of the highlights for FY19 listed by strategic theme are:

Drinking Water Quality and System Performance

- Met all regulatory requirements for safe drinking water and again received the DEP 2019 Public Water System Award for Outstanding Performance.
- Continued the School Lead Sampling Program that provides assistance to MWRA member communities with analysis of drinking water from schools for lead that began in FY16. In FY19, MWRA's Central Lab conducted 18,900 lead tests from 428 schools in 46 communities. MWRA continued a pilot program begun in FY18 to provide lead testing in childcare facilities.
- Provided drinking water sampler training and ERP training in conjunction with DEP to community staff.
- Distributed approximately \$2.6 million in loans from the Lead Service Line Replacement Program to communities for lead service line replacements. In total, since FY17, \$11.6 million in loans targeting full removal of lead water service lines have been distributed.



Wastewater Management and System Performance

- Received the Platinum award for Deer Island Treatment Plant from NACWA for 12 consecutive years without a NPDES violation.
- Received the NACWA Silver Award for the Clinton Wastewater Treatment Plant for less than five permit violations in a calendar year (three violations in calendar year 2018).

- Completed and optimized operation of the new Clinton phosphorus removal facility in compliance with the April 1, 2019 deadline required in the new NPDES permit.
- Continued to implement the court-ordered CSO assessment including inspections of CSO regulators, installation of temporary overflow meters, and collection of data from meters and rain gauges in order to update and calibrate MWRA's hydraulic model. MWRA received a one-year extension of the final milestone from the federal court for the submission of the assessment report for the CSO program to December 2021. As required, MWRA issued semiannual progress reports in November 2018 and May 2019.



Infrastructure Management, Resilience and Redundancy

- Completed construction of the Wachusett Aqueduct Pumping Station, which began in FY16.
- Completed the computerized maintenance management system (MAXIMO) upgrade with several new features that assist in tracking and displaying key performance indicators.
- Continued major facility rehabilitation and equipment upgrade at Chelsea Creek Headworks. Work is 52% complete, with substantial completion expected for November 2020.
- Began construction on the Commonwealth Avenue Pumping Station Improvements designed to provide additional water system redundancy in the event of the loss of the City Tunnel (Contract 7524), with substantial completion expected by September 2020. Work is 11% complete.



Financial and Management

- Community Assessments increased by 3.07% in FY19 and are projected to increase no more than 3.6% annually through FY23. Assessments for the Water and Sewer utilities are now "smoothed" reducing the volatility of year-to-year assessment changes thereby improving the sustainability and predictability for member communities.
- Advanced the mission of the newly formed Occupational Health and Safety Department, reviewing existing programs and policies, auditing facilities and participating in training classes. Procured safety software to aid in reducing workplace injuries and preparing OSHA regulatory reports.
- Launched a web application that allows staff to access water quality data collected at the Quabbin and Wachusett Reservoirs.

Environmental Sustainability

- Continued to reduce MWRA's Green House Gas emissions through the purchase of hybrid vehicles and electric vehicles. In FY19, MWRA purchased one hybrid electric vehicle, three all electric SUVs and three Flex-Fuel SUVs.
- Started generating electricity from the solar panels at the newly constructed Wachusett Aqueduct Pumping Station in June. Expect to generate about 90,000 kWh annually with the electricity to be used at the Carroll Water Treatment Plant.
- Ensure that flood protection is incorporated into all facility rehabilitation projects, including recently completed Alewife Brook Pump Station upgrade and the on-going Chelsea Creek Headworks upgrade.

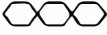
BUDGET/FISCAL IMPACT:

Any budgetary impacts of the initiatives in the Business Plan are accounted for in the CEB and CIP.

ATTACHMENT:

Attachment 1: Review of MWRA Five Year Strategic Business Plan, FY16-FY20 with FY19 updates

KEY:

Not started 



Initiated 

In progress 



Achieved 





On-going Core Activities 


I. Drinking Water Quality and System Performance

Goal #1: Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations.		
Objective	2019	Highlights/ Progress Updates
<p>A. Optimize operation of water treatment facilities to produce high quality, safe drinking water while maximizing water aesthetics (e.g. taste, clarity, and odor).</p>		<ul style="list-style-type: none"> MWRA met all regulatory requirements for safe drinking water. MWRA received the DEP Drinking Water Outstanding Performance Award for 2019.
<p>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.</p>		<ul style="list-style-type: none"> MWRA continues to coordinate monitoring efforts with DCR for both routine algae and algal toxin monitoring as well as reservoir emergency response planning. In FY19, MWRA continued Abraxis algal toxin testing for source and finished water. MWRA continued weekly inspections to monitor for cyanobacteria blooms in standby reservoirs during May-September. Work began with MIS to develop a secure web-based application to document and review weekly inspections. MWRA continues to coordinate field and laboratory resources to aid local water departments and in-house in resolution of water quality complaints and water storage tank cleaning projects or activations. Staff trained internal sampling staff across numerous departments in an effort to


		<p>expand the use of new colorimeters by Summer 2019.</p> <ul style="list-style-type: none"> • Staff performed source water turbidity testing in 2018 from July to October as part of Wachusett Aqueduct Pump Station functional acceptance testing.
<p>C. Ensure reliability of data presented in required regulatory compliance reports.</p>	<p>→</p>	<ul style="list-style-type: none"> • Increased automation of the process for calculation of annual statistics for CCR/Annual Water Quality report.
<p>D. Work cooperatively with DCR and the Watershed Trust to ensure effective and transparent watershed management for water quality protection.</p>	<p>→</p>	<ul style="list-style-type: none"> • Staff reviewed and commented on the update of the Quabbin, Ware and Wachusett Watersheds Protection Plans.
<p>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.</p>	<p>→</p>	<ul style="list-style-type: none"> • Met all statutory requirements for downstream releases. • MWRA achieves exceptional raw water quality through effective water transfer between the Quabbin and the Wachusett Reservoirs, based on amount and timing of transfers. • MWRA assessed standby reservoir monitoring program through results obtained during annual water quality sonde profiling and grab sample analysis. • Sudbury Reservoir, Foss Reservoir, Chestnut Hill Reservoir, Fells Reservoir, and Spot Pond are all kept within their normal operating ranges. Water has not been added to either Fells or Spot Pond since going into standby status in 1998. Level control has been maintained through the removal of excess water when the elevation has been above the normal operating range.
<p>F. Enhance the safety and security of the water supply and watershed system against accidental or intentional threats and hazards.</p>	<p>→</p>	<ul style="list-style-type: none"> • Continued implementation of consequence management practices to guide alarm response at contaminant monitoring locations. In FY19, twenty actionable alarm events were responded to across MWRA contaminant monitoring system locations. • In 2019, six 300-lb buoy anchors were installed at the buoy mooring locations in

		<p>the Wachusett Reservoir. The new buoy anchors will replace the old 75-lb anchors and will also ensure that the buoys are deployed to the same fixed location every year for water quality profiling.</p> <ul style="list-style-type: none"> Continued deployment of water quality profiling buoys and sondes for reservoir monitoring in 2018 and 2019. All three water quality-profiling buoys were deployed, and collected profiling data at Basin South, Basin North and the intake locations at the Wachusett Reservoir.
<p>G. Identify potential transportation related contaminants to the source water and develop a response to potential contamination from these sources.</p>		<ul style="list-style-type: none"> Continued UMass Amherst research project to evaluate strategies for minimizing impacts of an oil spill and cyanotoxins in Wachusett Reservoir using treatment scenarios at the Carroll Water Treatment Plant. In 2019, UMass Amherst began developing an analytical method to quantify cyanotoxins removed during the mitigation of cyanotoxins in Wachusett water using treatment processes deployed at the CWTP. MWRA procured a new bench-top Calgon Rayox UV reactor on behalf of UMass Amherst for UV laboratory experiments. The reactor was delivered to, and installed at UMass Amherst Civil and Environmental Engineering Lab in 2018. In 2019, MWRA provided a letter of agreement to UMass Amherst regarding responsibilities for ongoing maintenance of the procured UV reactor.
<p>H. Evaluate ways to improve monitoring and managing the system to maintain high quality water all the way to the ends of the community systems.</p>		<ul style="list-style-type: none"> Continued water quality monitoring at key MWRA facilities across the distribution in 2018 and 2019. In 2019 staff completed the installation of new S::can units at the Shaft 9A and CWTP-Raw inlet. Expanded online monitoring to include Gillis Pumping Station with the installation of a new chlorine analyzer in FY19.




		<ul style="list-style-type: none"> MWRA developed purchase specifications for procurement of new technologies for cyanobacteria and radiological monitoring. Purchases are expected by end of FY19 and early FY20, respectively.
I. Advocate for responsible and reasonable revised drinking water regulations.		<ul style="list-style-type: none"> MWRA staff continue to be active in state and federal review of the Lead and Copper Rule, and Unregulated Contaminant Monitoring Rule, as well as other proposed rule and guidance changes. MWRA began sampling in January 2018 for the Unregulated Contaminant Monitoring Rule 4 (UCMR4), a three year monitoring program (2018-2020). In December 2018, staff developed and delivered a training program for selected partial and CVA communities. Training continued in 2019. MWRA staff are participating in the DEP stakeholder process for developing PFAS regulations.
J. Develop improved data handling, auditing, and reporting functionality.		<ul style="list-style-type: none"> Monthly compliance report now available to DEP via electronic download. Began the migration of current and historical data stored in Excel worksheets and Microsoft Access to relational databases. Automated the generation of monthly DPH form. In January 2019, staff implemented new chemical addition forms for monthly submission to DEP.
Goal #2: Continue to effectively report and communicate water quality information to our customers and public officials.		
Objective	2019	Highlights/ Progress Updates
A. Distribute the federally required annual water quality report, the Consumer Confidence Report (CCR), to all households.		<ul style="list-style-type: none"> Completed Annual Water Quality report in June and distributed to homes, as well as posted on MWRA website. Additional focus this year on lead related issues and infrastructure investment.
B. Maintain and improve water quality and public health information on MWRA's web page, www.MWRA.com.		<ul style="list-style-type: none"> In FY19, notices were posted regarding PFASs and lead, which remain topics in the news. The Annual Water Quality Report remains prominently featured at the top of




		<p>the home page and was publicized through Twitter and other new outlets. The monthly water quality reports were posted regularly and sent directly to subscribers through the Everbridge application.</p> <ul style="list-style-type: none"> • During FY19, MWRA continued to update and add water quality information to its website, including alerts on consumer WQ scams. • MWRA again participated in AMWA’s “Imagine A Day Without Water” in October 2018 and AWWA’s “Drinking Water Week” in May 2019 with relevant postings on MWRA.com and Twitter.
<p>C. Investigate web-based and more real time reporting of data.</p>		<ul style="list-style-type: none"> • Continued investigating operational data sources and technologies for data management, integration and warehousing. • A new system was implemented for the collection, storage and visualization of operational buoy data leveraging OSISoft’s PI technology. The PI database in Chelsea will be the central repository for all MWRA PI data. MIS provided staff with the ability to look at operational buoy data using tools such as Matlab and PI Analytics. • Designed, created and implemented Shiny apps for reviewing LIMS data, MWRA and community coliform, chlorine residual and temperature data, and hand-cast and buoy sonde data. These apps were developed to make them easily accessible to all MWRA users.
<p>Goal #3: 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>Objective</p>	<p>2019</p>	<p>Highlights/ Progress Updates</p>
<p>A. Provide technical and operational support through training, on-call contracts, and targeted assistance, as needed.</p>	<p style="text-align: center;">→</p>	<ul style="list-style-type: none"> • Continued School Lead Sampling Program, providing assistance to MWRA member communities with analysis of drinking water from schools for lead. MWRA’s Central Lab conducted 18,900 lead tests from 428 schools in 46 communities opting to participate in the Program. Continued a





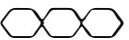
		<p>pilot program providing lead testing in childcare facilities.</p> <ul style="list-style-type: none"> • Provided technical assistance to communities during water quality events and water main breaks. • Demonstrated the contaminant monitoring system mobile trailer during community Emergency Response Plan training sessions and an MWRA Advisory Board meeting. • Provided assistance with leak detection and valve operations to communities as requested. Assisted 28 municipalities in the MWRA’s Service Area with leak detection in their systems in FY19. • Met with one additional fully-served community in FY19, for a total of 23 out of 43 customer communities. The meetings were held to discuss water quality and distribution system topics. • Participated in each of the seven MWRA community Emergency Response Plan Training sessions and discussed various water quality subjects including coliform sampling and cyanobacteria bloom monitoring, and PFAS. • MWRA provided biennial drinking water sampler training in 2019. Over 85 community staff attended the training co-taught between MWRA and DEP Drinking Water Program Staff. Staff continue to train samplers upon community request or in response to coliform events.
<p>B. Promote and manage MWRA’s Local Water System Assistance Program to help facilitate improvements in local community infrastructure.</p>	<p>→</p>	<ul style="list-style-type: none"> • In FY19, an additional \$35.9 million in MWRA interest-free loans were distributed to member water communities. In total, more than \$411 million in loans have been distributed to fund 448 local projects and 42 of 45 eligible water communities are participating. Since 1998, 544 miles of local water main have been replaced or cleaned and lined (about 8% of the regional system)





		<p>via projects funded by MWRA financial assistance. In FY17, \$100 million lead service line replacement loan program began. In FY19, an additional \$2.6 million was distributed to member water communities. In total, \$11.6 million in loans targeting full removal of lead water services have been distributed.</p> <ul style="list-style-type: none">• Conducted significant outreach associated with the addition of the lead service line replacement program, as well as additional outreach on other local lead issues.
<p>C. 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.</p> <p>COMPLETED</p>		<ul style="list-style-type: none">• Coordination with the Advisory Board on development of Phase 3 Local Water System Assistance Program was completed in FY17. Beginning with the Final FY18 CIP, a new \$292 million Phase 3 of the community water loan program has been approved by the Board of Directors and made available to member communities.


II. Wastewater Quality and System Performance

Goal #4: Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.		
Objective	2019	Highlights/ Progress Updates
<p>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.</p>		<ul style="list-style-type: none"> • Conducted a total of 1349 industrial waste inspections (SIUs and non-SIUs), 960 gas oil separator inspections, and 132 septage and septage hauler inspections. • Staff responded to 100% of all discharge violations for both Significant Industrial Users (SIUs) and Non-Significant Industrial Users (NON-SIUs) by taking enforcement action in accordance with its EPA approved Enforcement Response Plan (ERP). • Conducted a total of 2,926 sampling events for the following activities: <ul style="list-style-type: none"> ○ 1438 industrial ○ 199 NPDES permit related ○ 14 for emergency response ○ 244 for local limits ○ 1488 for special projects • Sampled 172 permitted Significant Industrial Users (SIU) with a discharge at least once in FY19. • Issued or renewed 442 permits
<p>B. Continue to monitor DITP and Clinton Process Controls and quality of treated effluent to optimize plant performance and ensure that all applicable NPDES permit limits continue to be attained.</p>		<ul style="list-style-type: none"> • Deer Island was awarded a Platinum award from the National Association of Clean Water Agencies (NACWA) for 12 consecutive years without a NPDES permit violation. • The Clinton Treatment Plant was awarded a NACWA Silver Award for less than five permit violations in a calendar year (three violations in calendar 2018).
<p>C. Implement enhanced phosphorus control at the Clinton Wastewater Treatment Plant.</p> <p style="color: #4CAF50; font-weight: bold; margin-top: 10px;">COMPLETED</p>		<ul style="list-style-type: none"> • Construction of phosphorus removal facility (Contract 7411) substantially complete as of March 2018. The facility is operating in compliance with the new NPDES permit effective April 1, 2019.

<p>D. Develop a molybdenum (Mo) control strategy to enable more widespread biosolids reuse.</p>		<ul style="list-style-type: none"> In FY17, DEP simplified its Mo limits from two separate limits into one and raised the limit to 40 ppm, which enables MWRA to use its biosolids in-state year-round. MWRA pellet Mo levels remained below the 40 ppm limit at all times in FY18 and FY19. Staff are continuing to work with water treatment chemical suppliers to avoid cooling tower products containing Mo and have developed a draft Mo fact sheet for distribution by the chemical suppliers to their customers.
<p>E. Comply with I/I mapping and planning requirements in state environmental regulations and NPDES permits.</p> <p>COMPLETED</p>		<ul style="list-style-type: none"> Submitted Clinton Collection System Operation and Maintenance Plan outline by 9/1/2017, full plan by 12/31/2017 (in advance of March 2019 deadline), and collection system map by 5/15/2017 (in advance of September 2019 deadline), and annual report including I/I data by March 2019 to comply with Clinton NPDES permit. Submitted I/I control plan for MWRA collection system by 12/31/2017, to comply with 314 CMR 12.04(2).
<p>F. Conduct an evaluation of the CSO treatment processes to determine potential opportunities to better meet permit limits.</p> <p>COMPLETED</p>		<ul style="list-style-type: none"> Evaluation of the CSO treatment processes was conducted in FY16 under MWRA Contract #7400, Task Order No. 15. The evaluation of each CSO facility involved reviewing both the equipment and operation of each CSO facility, as well as performing additional sampling during activations. A final report was submitted with the findings and recommendations for each facility. Next steps: <ul style="list-style-type: none"> Several key recommendations have been carried forward into the Prison Point Improvement Project (induction mixers, additional post chlorination sample locations, etc.). This improvement project is currently at the 100% design level. Lessons learned as a result of the Prison Pt. Improvement Project will be applied at Cottage Farm.


Goal #5: Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality.		
Objective	2019	Highlights/ Progress Updates
A. Prepare updated Local Limits Studies for Clinton and Deer Island in accordance with EPA guidelines to confirm appropriate discharge limits from industries.		<ul style="list-style-type: none"> • New Clinton NPDES permit was issued by the EPA and became effective March 1, 2017. The Local Limits reassessment was approved by EPA in FY19. In the spring of 2019, MWRA issued revised regulations for public comment. Revisions included updates to the Local Limits for the Clinton Sewerage Service Area based on the reassessment approved by EPA. • Awaiting EPA's issuance of new NPDES permit for DITP.
B. Continue to review all Ambient Monitoring Plan questions and conduct evaluations to ensure they address MWRA needs and public concerns		<ul style="list-style-type: none"> • A review workshop focusing on Ambient Monitoring Plan questions was conducted (in concert with regulator's' Outfall Monitoring Science Advisory Panel) in Q2 of 2019. • A follow-up meeting with the Outfall Monitoring Science Advisory Panel was held in April 2019 to review workshop results and recommend next steps.
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, endangered species designations, co-permittees, and nitrogen impacts on Massachusetts Bay.		<ul style="list-style-type: none"> • Key issues in FY19 were emerging contaminants including perfluorinated compounds and pharmaceuticals, and rapid notification of CSO discharges.
D. 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.		<ul style="list-style-type: none"> • Enqual is responsive to the public's concerns to emerging contaminants and performs investigations as needed to address these concerns. • In FY19, MWRA contributed support to academic studies of emerging contaminants in wastewater and in Massachusetts Bay.
E. Review new organic waste treatment technologies as they arise.		<ul style="list-style-type: none"> • No new technologies to review in FY19.
F. Prepare for the Dental Amalgam Rule change.		<ul style="list-style-type: none"> • The final rule was issued with an effective date of July 14, 2017. It requires only dentists who begin discharge to the sewer after July 14, 2017 to


		<p>comply immediately with a certification statement that they have an approved amalgam separator. In the revised Sewer Use Regulations issued for public comment in FY19, TRAC included a new group permit for Dental Discharges. TRAC anticipates that approximately 1,000 dental facilities will receive a group permit in March of 2020. TRAC is developing new permit and outreach document for the Dental Discharges group permit. Currently, DEP manages a dental certification program. TRAC is working with DEP to transition the program to MWRA.</p>
<p>Goal #6: 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>2019</p>	<p>Highlights/ Progress Updates</p>
<p>A. Complete implementation of the remaining 3 of the original 35 CSO control projects.</p> <p style="text-align: center; opacity: 0.5; font-size: 2em; transform: rotate(-15deg);">COMPLETED</p>		<ul style="list-style-type: none"> • Staff attained substantial completion of the last three CSO projects in FY16, in compliance with Schedule Seven, with the cooperation of BWSC and the City of Cambridge.
<p>B. Attain levels of CSO discharge frequency and annual volume specific to each of the receiving basins addressed in the long-term CSO plan by 2020.</p>		<ul style="list-style-type: none"> • Staff continue to report CSO discharge estimates to EPA and DEP annually, track, and evaluate performance against the court-ordered long-term levels of control. • As part of the scope of the CSO performance assessment noted below (D.), staff and the consultant are investigating site-specific measures that can further reduce CSO discharges where needed to help meet the long-term CSO plan’s levels of control.
<p>C. Complete final eligibility reviews and closeout of each completed community-implemented CSO Project.</p>		<ul style="list-style-type: none"> • Staff completed final eligibility reviews and closed out the community CSO memoranda of understanding and financial assistance agreements (“MOU/FAA”) with Town of Brookline and BWSC in FY15 and FY17, respectively. • Regarding a separate but related financial assistance agreement, BWSC expects to submit construction plans to MWRA in CY2020 for removal of stormwater inflow from systems tributary to BWSC’s Dorchester Interceptor.

		<ul style="list-style-type: none"> • The MOU/FAA with City of Cambridge ended on June 30, 2018, and staff expect to complete final eligibility reviews and close out by early FY20.
<p>D. Develop scope for the court-ordered CSO verification assessment by FY16 and implement the assessment during the period CY 18-20.</p>		<ul style="list-style-type: none"> • MWRA received an extension of the final milestone to submit the assessment of the CSO program by December 2021 (rather than 2020). • MWRA issued Notice to Proceed with the contract for the CSO Post-Construction Monitoring and Performance Assessment in November 2017, ahead of and in compliance with the January 2018 milestone in Schedule Seven. • The consultant completed inspections of more than 200 closed or active CSO regulators and the installation of temporary overflow meters in the spring of 2018. The consultant continues to collect and evaluate data from the temporary meters, as well as permanent community and MWRA meters, and a network of rain gauges. The consultant is updating MWRA’s hydraulic model, and calibrating the model with meter data collected in 2018. Staff continue to collect receiving water quality data and have initiated CSO stormwater sampling to support the consultant’s development of receiving water quality models of the Charles River and Alewife Brook/Upper Mystic River. In November 2018 and May 2019, MWRA issued semiannual, reports on the progress of the performance assessment towards issuing a final report that will assess the attainment of court-ordered levels of CSO control.



Goal #7: Assist member communities to improve their wastewater collection systems through ongoing technical, financial, and operational support programs.


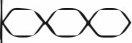
Objective	2019	Highlights/ Progress Updates
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<p>A. Provide technical and operational support including TV inspections, fieldwork assistance, or other targeted assistance, as needed.</p>		<ul style="list-style-type: none"> • Staff routinely provide technical assistance when requested. In FY19, MWRA responded to one request for a TV inspection from the City of Woburn and three other assistance requests from the cities of Chelsea and Medford.
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<p>B. Promote and manage MWRA's Inflow/Infiltration (I/I) Local Financial Assistance Program to facilitate reduced I/I in local community infrastructure.</p>		<ul style="list-style-type: none">• In FY19, an additional \$46.4 million in MWRA grants and interest-free loans were distributed to member sewer communities. In total, more than \$401 million in grants and loans have been distributed to fund 574 local projects and all 43 sewer communities are participating. Since 1989, average annual wastewater flow to DITP has been reduced by about 70 mgd, an 18% reduction. (See more information in the Annual NPDES I/I Reduction Report).
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III. Infrastructure Management and Resilience


Goal #8: 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.		
Objective	2019	Highlights/ Progress Updates
<p>A. Continue to ensure proper operations and maintenance of the water and wastewater systems and minimize system downtime by performing Preventative, Predictive, and Corrective maintenance on equipment and linear assets, water system leak surveys, valve inspections and exercise, and performing inspections and cleaning of wastewater pipelines, structures, water storage tanks, and inverted siphons inspections, and cleaning.</p>		<ul style="list-style-type: none"> • Replaced 14 water blow-off retrofits and 20 main line valves, entailing excavating and isolating the main from the valve, cutting out the old valve and installing a new one. • Inspected 144 miles of MWRA water mains and repaired 23 leaks. • Performed independent water meter testing to confirm the accuracy of the meters supplying the municipalities in MWRA Service Area. • Inspected 35.02 miles of MWRA wastewater interceptors and 48 siphon barrels. • Cleaned approximately 36.17 miles of wastewater interceptors and 123 siphon barrels. • Replaced 109 water and wastewater manhole frames and covers.
<p>B. Inspect, maintain, and improve the dams, dikes, and other facilities constituting the infrastructure of the reservoir system through ongoing regulatory inspections, maintenance and an adequate multi-year operations and maintenance program, and capital improvement program in order to ensure system reliability, regulatory compliance, and limit potential flood hazards.</p>		<ul style="list-style-type: none"> • Since 2005, over \$22M has been invested in capital and major maintenance of source and distribution water supply dams across the system. Continue to ensure the Dam Safety Compliance Program is followed for periodic regulatory inspections and reporting to MA Office of Dam Safety, ensure inspection findings of any deficiencies and needed maintenance issues are addressed. Ensure the dams' Emergency Action Plans are routinely updated and exercised. • Awarded new contracts for needed dam repairs design, bid document production and ESDC for Sudbury Dam spillway masonry and vent repairs, Wachusett North Dike earthen berm restoration, Wachusett North and


		<p>South Dike instrumentation, Foss Dam overtopping protection.</p>
<p>C. Continue use of Condition Monitoring for Deer Island and expand Condition Monitoring techniques for all other water and wastewater facilities to provide earlier indication of asset degradation.</p>		<ul style="list-style-type: none"> • Condition Monitoring techniques continue to be utilized in normal business practices at DITP. Deer Island is now expanding its lube oil program. Staff are able to perform basic oil testing in lieu of sending samples out. This provides immediate results about MWRA's assets and reduces downtime. • Continued to roll-out Condition Monitoring in FOD, including all the headworks, pump stations, and CSO facilities. Actions include oil sampling to determine the remaining life expectancy of the oil, ultrasonic testing of the grit pipe in the headworks, and vibration analysis. Staff continues to implement infrared thermography and laser alignment of pumps and fans. Initial staff training has already been instituted, but training will continue in FY20, specifically on vibration analysis and laser alignment.
<p>D. 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>		<ul style="list-style-type: none"> • No work on this initiative to date.



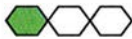
<p>E. Update the wastewater metering system and evaluate new technologies to ensure continued accurate flow accounting and to enhance its usefulness for operational and evaluation purposes by adding additional monitoring locations.</p>		<ul style="list-style-type: none"> • Work is underway on Contract #6739 for wastewater metering system replacement, awarded by the Board of Directors in June 2017. Phase one includes the evaluation, planning and design of the wastewater metering system of approximately 225 permanent meter sites, including updating the flows from unmetered areas, and assessing state of the art meters, data management, and communication technologies. Phase one is 90% complete. Phase two, contract #7191, consists of the installation of the new metering system, and has an expected NTP of Q1 FY20. A design and construction project to provide utility power for those meters determined to be useful during significant storms to monitor system performance has been reevaluated given improved battery technology compared to the anticipated cost of utility power at each site. Further analysis is being performed in-house prior to moving into the construction phase.
<p>F. Continue to research and develop Key Performance Indicators (KPI) to compare our performance internally and against the industry.</p>		<ul style="list-style-type: none"> • The MAXIMO upgrade was completed in FY19. The updated MAXIMO is assisting MWRA in making KPI's easy to track, display and compare with other industries. • Maximo 7.6 has an Ad-Hoc reporting tool that allows users to design one-time or multi-use reports to measure wide array of business metrics. • MWRA is hiring a new Business Analyst to assist in expanding Maximo's Business Intelligence Reporting Tools. These tools will assist staff in determining the best data to select for metrics.
<p>G. Enhance and monitor water pipeline protection to maximize pipeline lifetime.</p>		<ul style="list-style-type: none"> • In FY16, MWRA began the process of replacing old cathodic protection on MWRA water mains. In FY19, this work continued in force, with the following activities: <ul style="list-style-type: none"> ○ Designed eleven replacement cathodic protection systems for Section 57, an 80 year old 48-inch diameter steel water main

		<p>in the northern low service area. In-house construction staff are working to replace these systems. Nine of these systems were completed in FY17-FY18, and work continues on the remaining two.</p> <ul style="list-style-type: none"> ○ Replaced the cathodic protection system at Shaft 5 of the City Tunnel. ○ Construction for replacement of cathodic protection system at Shafts E and L of the MWWST began in January 2019. Substantial completion is on target for August 2019. (Contract 6440). ○ Design NTP (under Technical Assistance Contract 7498, Task Order No. 20) for the replacement of cathodic protection systems at Shafts N and W is August 2019. ○ Assessment of existing cathodic protection systems on Section 98 running through Winthrop to Deer Island is ongoing. ○ Continue evaluating cathodic protection test stations for upgrade and replacement. ○ Capital program has added design and construction phases to replace and upgrade cathodic protection systems based upon testing results.
<p>H. 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>		<ul style="list-style-type: none"> ● Maximo now tracks life-cycle costs for Clinton, DITP, FOD, IT and Lab assets. End of Life asset values are now captured in the Property Pass site. ● Maximo Spatial (GIS) interface updates the mapping features giving staff easier access to buried assets history for the Water Distribution and Wastewater Collection systems.


<p>COMPLETED</p>		<ul style="list-style-type: none"> • Maximo Anywhere (mobile solution) allows staff to receive work and update work orders and asset history in the field. • PI system was also updated to the latest version which includes enhanced security features with Data Diodes.
<p>I. 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>		<ul style="list-style-type: none"> • PLC upgrade was completed at Comm. Ave West Pump Station; A new PLC Panel was designed, purchased and installed at BWTF; the system will be programmed in-house and cutover September 2019. A design contract for the JJCWTP SCADA Improvement was finalized in January 2019 with construction to begin in August 2020 and substantial completion in May 2022. PLC upgrades for BOS019 and Framingham PS are underway and scheduled to be completed in early 2020. Additional PLC replacements are being performed as part of facility rehabilitation projects (Chelsea Creek Headworks, Alewife, Comm. Ave. East, Braintree-Weymouth etc), and will be developed in future PLC upgrade projects for water and wastewater facilities. • Standards templates and guidelines were developed for High Performance Human Machine Interface (HMI) Graphics. New graphics will be implemented to improve operator situational awareness through ongoing design and construction projects and MWRA staff implementation. • Installed a new network security monitoring system and new firewall technologies. • Established internal committees to review MWRA's physical resilience, and identify deficiencies and subsequently safety systems to provide multiple levels of protection from cyber attacks on MWRA's assets. • Began the process of converting the SCADA network to an active directory domain which

		will allow the MWRA to centralize protection of its computer network from cyber attacks.
Goal #9: Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.		
Objective	2019	Highlights/ Progress Updates
<p>A. Continue to design and implement the rehabilitation projects for various pump stations, headworks, and CSO facilities.</p>		<ul style="list-style-type: none"> ● A major facility rehabilitation and equipment upgrade construction project was completed at Alewife Brook Pump Station. Additional work is underway at Chelsea Creek Headworks. Specific rehabilitation projects include: <ul style="list-style-type: none"> ○ Chelsea Creek Headworks Upgrades, Contract 7161, is underway and 52% complete with substantial completion expected for November 2020. ○ Design of Prison Point CSO Facility Improvements, Contract 7359, to upgrade, replace and add major facility components (gates, screen, conveyors, pump engines, mixers etc.) is at 100% design. ○ DeLauri Pump Station bar screen replacement and security upgrade (Contract 7361) was substantially completed in February 2019. ○ Design of Nut Island Headworks Odor Control & HVAC Systems Improvements, under Contract 7517 is at 100% design. ○ Construction to replace screens and install security improvements at DeLauri PS (Contract 7361) was completed in February 2019. ○ Alewife Brook PS, Contract 6797, reached substantial completion in March 2019. ○ The Remote Headworks & DI Shaft Study was awarded in June 2018 to study and provide recommendations for rehabilitation of effluent and influent shafts. ○ Design and Construction of replacement fuel tanks was completed at the Quincy and Hingham Pump Stations.

		<ul style="list-style-type: none"> ○ Braintree-Weymouth Pump Station improvements (Design Contract 7435) was awarded in December 2018 and is ongoing.
<p>B. Develop ongoing program review, prioritize, and accelerate the implementation of interceptor renewal projects.</p>		<ul style="list-style-type: none"> ● Evaluated wastewater interceptors and prioritized them for rehabilitation. In the FY 16 CIP a number of project schedules were accelerated. ● The Reading Extension Sewer Rehab, Contract 7164, was awarded in May, 2017 and reached substantial completion in December 2018. ● In June 2019, MWRA advertised the Dorchester Interceptor Renewal project (sections 240, 241, and 242) with an expected NTP of October 2019. ● Rehabilitation of Sewer Sections 19, 20 & 21 are being designed under Contract 7540 and is at 60% design. ● Design of the Charles River Sewer Rehabilitation is being completed in-house with a construction NTP expected by November 2019.



<p>C. Implement feasible recommendations from the North System Hydraulic Study to maximize conveyance of wastewater to Deer Island.</p>		<ul style="list-style-type: none"> • MWRA is continuing to implement feasible operational opportunities for system optimization within the North System wastewater conveyance system and provides funding for Inflow/Infiltration projects to North Metropolitan Communities. <ul style="list-style-type: none"> ○ Wastewater operations has implemented operational changes at the Headworks facilities to reduce the possibility of overwhelming screens during high flow conditions and maximizing the full capacity of the Boston Main Drainage Tunnel by allowing more than design capacities to pass through Columbus Park or Ward Street Headworks when available capacity exists in the other.
<p>D. Complete DITP valve and piping replacement project including operationally complex North Main Pump Station/Winthrop Terminal valve replacement.</p>		<ul style="list-style-type: none"> • 100% complete on the DITP valve and piping replacement project. Entire project was completed by the second quarter of FY18.
<p>E. Replace six (6) 600 HP motors and six (6) Variable Frequency Drives in Winthrop Facility on Deer Island.</p>		<ul style="list-style-type: none"> • Completed one 600 HP motor and one Variable Frequency Drive unit. Expected to complete two more by the end of FY20.


Goal #10: Prepare for catastrophic events that could affect the water and wastewater delivery systems.

Objective	2019	Highlights/ Progress Updates
<p>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</p>		<ul style="list-style-type: none"> • In February 2017, the Board of Directors approved a plan for construction of two new water supply tunnels to provide redundancy for the Metropolitan Tunnel system (City Tunnel, City Tunnel Extension and Dorchester Tunnel). In April 2018, a new Director of Tunnel Redundancy was hired to lead this project. Since April 2018, five staff have been added to the Tunnel Department


<p>Northern Intermediate High, the Southern Extra High, and the Metro Tunnel System.</p>		<p>including a Manager of Design and Construction. In March 2019, the first consultant was hired to support early program level work.</p> <ul style="list-style-type: none"> • Construction on the Wachusett Aqueduct PS, Contract 7157, begun in FY16, reached substantial completion in February 2019. • Construction continued on various sections of the Northern Intermediate High: <ul style="list-style-type: none"> ○ Work on the first Stoneham Section 110, Contract 7478, was complete in September 2018. The new 48" water main was activated on July 10, 2018. ○ Work on the second Stoneham Section 110, Contract 7067, is underway and approximately 67% complete with an expected completion date of June 2020. • Construction continued on various sections of the Southern Extra High: <ul style="list-style-type: none"> ○ Work on Section 111 Boston Section of the Southern Extra High Pipeline project, Contract 6454, was completed in July 2018. ○ Section 111 Dedham North, Contract 7504, started in October 2017 and is 76% complete with an expected completion date of November 2019. ○ Section 111 Dedham South, Contract 7505 - NTP was issued in August 2018, and is 32% complete with an expected completion date of November 2020. ○ Commonwealth Ave. Pump Station Improvements designed to provide additional water system redundancy in the event of the loss of the City Tunnel (Contract 7524) began the construction phase in February 2019 and is anticipated to be complete by September 2020. Work is 11% complete.
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		<ul style="list-style-type: none"> ○ Steel Tank Painting at Turkey Hill and Bellevue 2 Water Tanks (Contract 7634) started in August 2018 and was completed by July 2019. ○ Sections 23, 24, and 47 Rehabilitation Design Contract 6385 is at 100% design and when constructed, will provide redundancy to Boston and Watertown. ○ Sections 50 and 57 Rehabilitation Design Contract 7540 is at 60% design. ○ Northern Intermediate High, Sections 89/29 Replacement Design was awarded April 2018 and provides replacement of a suspect prestressed concrete cylinder pipe. ○ Low Service Pressure Reducing Valve Improvements Design Contract 7575 was awarded June 2018 and will provide additional operational flexibility to provide water service during emergencies. ○ Intermediate High Improvements Design Contract 6955 was awarded January 2019 and will, when complete, interconnect two Intermediate High Service Area to provide redundancy and operational flexibility in the event of pipe failures.
<p>B. Continue to train staff on various potential emergency scenarios and participate in broader Massachusetts Emergency Management Agency (MEMA) and other training exercises.</p>	<p style="text-align: center;">→</p>	<ul style="list-style-type: none"> ● Staff participated externally hosted training, including a MEMA Hurricane Evacuation exercise, a National Guard sponsored cyber defense drill, and a FEMA sponsored ‘Black Sky’ extended power outage exercise. Internal trainings and exercises included: site characterization, unmanned aerial systems training, Deer Island emergency response team drills, boom deployment, terrestrial spills, severe weather response, mobile disinfection, communications, tunnel incident response, and community Emergency Response Plan training.
<p>C. Continue to implement a comprehensive security and</p>		<ul style="list-style-type: none"> ● Staff continue to upgrade and expand the MWRA security system by establishing a new

<p>emergency preparedness program.</p>		<p>security center for the guards to monitor the alarms and video and by integrating the new John J. Carroll Water Treatment Plant guardhouse, and Caruso PS into the overall system. Camera coverage was added at Carroll, the Interim Corrosion Control Facility, and the newly built Wachusett Aqueduct PS.</p> <ul style="list-style-type: none"> • Facility Emergency Action Plans are updated annually. The western dam emergency action plans are being updated in FY20. • Staff performed facility security audits at 26 facilities in FY19, bringing the total number of security audits completed in the last three years to 114. • Increased communication redundancy in FY19 by installing six wireless routers in various locations in the MWRA’s system.
<p>D. Develop and implement an Information Security Plan (ISP) to increase the resiliency and sustainability of the MWRA’s data security practices.</p>		<ul style="list-style-type: none"> • Since establishing MWRA’s ISP by ADM.31, 10 additional policies, 12 standards, and 30 procedures were drafted. These drafts continue revision and realignment with the latest version of the NIST Cyber Security Framework and integration of both MWRA Information Technology (“IT” – <i>i.e.</i> MIS) and Operational Technology (“OT” -- <i>i.e.</i> SCADA, PICS, I&C, and Physical Security) areas. • Planning continues for the next phase of this effort – to apply current cyber security standards, controls, and best practices appropriate to each IT system without disruption of service.





<p>E. Enhance cyber security defense in-depth strategy to mitigate and manage new and evolving threats.</p>		<ul style="list-style-type: none">• The Managed Security Services Contract (MWRA No. 7499), which began on July 1, 2016, was extended for two additional years, now ending on June 30, 2021.• MWRA staff participated in a weeklong cyber security incident response drill alongside the National Guard for the 3rd year.• All MWRA staff continued to be trained in basic cyber security awareness, and IT and OT staff in advanced cyber security technical topics.• Initiated and helped organize semi-annual Regional Water Sector OT/IT Security meetings to share cyber strategies and bring in outside subject matter experts as speakers.• Held the first internal cyber security incident response drill for management and technical staff.• Symantec, the sub-contractor to our Managed Security Services Provider, interviewed staff and provided cyber security recommendations.
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IV. Finance and Management

Goal #11: Ensure Financial Sustainability, Integrity, and Transparency.		
Objective	2019	Highlights/ Progress Updates
A. Continue the long-term strategic budgeting practice to ensure sustainable and predictable sewer and water assessments to our member communities.	→	<ul style="list-style-type: none"> Community Assessments increased by 3.07% in FY19 and are projected to increase no more than 3.6% annually through FY2023. Assessments for the Water and Sewer utilities are now “smoothed” reducing the volatility of year-to-year assessment changes thereby improving the sustainability and predictability for member communities.
B. Manage debt and investment portfolios to maximize savings/returns in compliance with all applicable rules and regulations.	→	<ul style="list-style-type: none"> Staff continue to explore opportunities for refunding for interest rate savings. Most recently issuing \$19.2M in refunding bonds in FY19 for a net present value savings of \$1.6M.
C. Continue diversification strategy to insulate against overexposure and promote resiliency to changing market conditions.	→	<ul style="list-style-type: none"> Staff continue to seek prudent diversification.
D. Maintain a system of internal controls to best protect the organization’s resources.	→	<ul style="list-style-type: none"> Staff continue to review and monitor key controls and limit physical and electronic access to assets.
E. Continue to employ budget and expense control practices to manage expenses.	→	<ul style="list-style-type: none"> Continued to drive cost improvement and containment measures throughout FY19 that allowed MWRA to achieve the projected rate revenue requirement level for FY20.
F. Identify and pursue optimization in all aspects of MWRA financial operations		<ul style="list-style-type: none"> Continued the effort of reducing the use of paper by publishing documents on-line. Staff are actively evaluating the electronic financial system’s existing and possible additional software modules to optimize operations. The Budget Department has been exploring a software solution to replace existing obsolete software.
G. Continue to conduct strategic energy procurements.	→	<ul style="list-style-type: none"> Continued to procure electricity based on competitive bid process and took advantage of electricity rebates from utilities pertaining to installation of more efficient equipment. Completed procurement of new electricity contracts for Deer Island and Interval Accounts contracts (96% of MWRA purchased demand) in FY19.



<p>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 (OPEB).</p>		<ul style="list-style-type: none"> • The pension fund has again reduced the assumed rate of return from 7.5% to 7.25% and increased the cost of living base from \$13K to \$14K in FY20 and to \$15K in FY21 and beyond. Though the valuation of the investment portfolio has increased, this has mathematically reduced the funded status from 94.97% to 89.19%. • The current OPEB Trust balance is \$37.1 million, which represents an approximately 23.0% funding level. The annual funding practice has been and is projected to be half the annual determined contribution. This practice will be evaluated annually and may be changed according to overall budgetary conditions.
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Goal #12: Ensure Cost-Effective Operational and Resource Management.


Objective	2019	Highlights/ Progress Updates
<p>A. Maintain and expand MWRA-wide recycling efforts.</p>		<ul style="list-style-type: none"> • As of July 1, 2019 the MWRA implemented a single stream recycling program in conjunction with existing paper, cardboard, and metal recycling efforts.
<p>B. Work with staff MWRA-wide to update construction and professional services contract documents.</p>		<ul style="list-style-type: none"> • Procurement staff continue to work with the Law Division to update construction contract documents. Completion of update of construction document expected by the end of CY2019. Procurement and Law Division staff will also work on updating professional services contract documents in the latter half of CY2019.
<p>C. Develop, implement, and transition to fully automated, virtually paperless procurement and purchasing system.</p>		<ul style="list-style-type: none"> • All Ch. 30 and Ch. 149 construction and non-professional contracts are now procured electronically. Staff will be implementing an electronic system of procuring Professional Services in the second half of CY2019.
<p>D. Expand use of electronic platforms for the purchase of all goods and services.</p> <p style="text-align: center; color: gray; opacity: 0.5; font-size: 2em; transform: rotate(-15deg);">COMPLETED</p>		<ul style="list-style-type: none"> • Virtually all goods are now purchased via electronic platforms.



<p>E. Procure, Develop and Implement E-Construction and E-Design Software for use in managing and tracking design and construction project.</p>		<ul style="list-style-type: none"> • E-Construction has been tested successfully in managing the Chelsea Headworks Rehabilitation construction project. E&C and MIS are working to develop scope for the procurement and implementation for future design and construction projects.
<p>Goal #13: Maintain an Excellent Workforce.</p>		
<p>Objective</p>	<p>2019</p>	<p>Highlights/ Progress Updates</p>
<p>A. Prioritize Succession Planning in anticipation of critical retirements over the next five years.</p>		<ul style="list-style-type: none"> • Continue to identify succession planning initiatives including training programs, leadership program, and expedited replacement hiring processes in advance of critical retirements. • A comprehensive exit procedure was developed in FY19 for use when employees leave the MWRA, documenting knowledge and information on projects, contacts, and location of files.
<p>B. Continue to provide a safe workplace free of hazards for all employees</p>		<ul style="list-style-type: none"> • The newly created position of Manager, Occupational Health and Safety, was filled in Q2 of FY19. • Continue to develop the Occupational Health and Safety Department including program and policy review and development, facility audits and by participating in training classes. Procure safety software to aid in reducing workplace injuries and preparing OSHA regulatory reports. • Provide Safety Awareness and Hazard Communication training to all employees. • Continue to improve safety culture through communication and leading by example. • Continue to assess the risks associated with tasks and provide the appropriate training, procedures and equipment to eliminate the risks. Examples of such training include confined space entry, lockout/tagout, electrical safety, Right to Know, Tower and Wind Turbine climbing, OSHA-10 Construction Safety and training in railroad

		<p>track area safety procedures, OSHA 24, Hot Works Safety and Scaffolding training.</p>
<p>C. Provide effective training necessary for employees to obtain and maintain required licenses and certifications to ensure a highly skilled workforce.</p>	<p>→</p>	<ul style="list-style-type: none"> • Wastewater and Collection Operator certification and license prep courses are provided at least twice per year on premises. • Employees are sent to vendor training throughout the year for prep on Water Distribution and Treatment. Classes are regularly offered to employees to meet continuing education requirements for license renewals and required hours.
<p>D. Continue MWRA's efforts to develop new recruitment and retention strategies to foster diversity, including traditionally underrepresented categories, people with disabilities, and veterans.</p>	<p>→</p>	<ul style="list-style-type: none"> • Staff attended six job fairs and continued to expand social media and other online recruitment efforts to increase access to diverse pools of candidates. Job postings are now sent to numerous web-based sites and professional associations. • Launched partnership with a social media recruitment network that reaches 2,500 plus followers who are minorities and people of color, 56% of whom are females between the ages of 18-34. • Participated in employment training program with local job readiness program. • Continued the use of The Local Job Network, a web based recruiting site where entry, mid-level, and senior level positions are posted to expand outreach to diverse protected classes. • Continued to add to the existing 258 recruitment sources for minorities, women, individuals with disabilities, and veterans in addition to its existing 53 recruitment sources identified in the Affirmative Action Plan. • Participated in three all veteran career fairs sponsored by Recruit Military and Veterans Inc. • Hired a total of 84 new employees including 13 (15%) females and 21 (25%) minorities.

		<ul style="list-style-type: none"> • Promoted 99 employees including 21 (21%) females and 27 (27%) minorities.
E. Continue to expand on MWRA’s in-house Job Shadowing and career development training programs.	→	<ul style="list-style-type: none"> • Continued the Operator on-the-job training program and maintenance mechanic shadow training programs. • Completed medium voltage training program at Deer Island and continue to provide this training elsewhere across the MWRA. Continue to offer supervisory development programs and water and wastewater prep courses.
F. Create programs with a focus on professional and leadership development.		<ul style="list-style-type: none"> • Continue to provide Non-Union managers Leadership Development Program through Bentley University.
G. Upgrade MWRA’s employment application system to add the onboarding module.	 <i>COMPLETED</i>	<ul style="list-style-type: none"> • Completed implementation of the onboarding module.
H. Continue intern initiative designed to increase future applicant pool.	→	<ul style="list-style-type: none"> • Hired 32 interns for the 2019 summer intern program.
I. Continue to ensure compliance with new state and federal regulations and labor.	→	<ul style="list-style-type: none"> • Staff did a thorough review of all non-union positions and the incumbents and implemented recommended changes as required by the Massachusetts Equal Pay Act. • New regulations regarding Paid Family Leave are anticipated September 2019 and staff have begun work on implementation to assure compliance.
Goal #14: Leverage Information Technology to Improve Organizational Effectiveness.		
Objective	2019	Highlights/ Progress Updates
A. Deliver Information Technology (IT) services and solutions efficiently and effectively.		See highlights under specific initiatives below.
B. Provide Information Technology solutions to streamline work processes while ensuring the security and integrity of MWRA data by leveraging the use of	→	<ul style="list-style-type: none"> • Implemented and updated WiFi Solution. Previously there were multiple locations with different wireless setups throughout the MWRA. A single, Authority-wide, secure solution has been implemented that has separate login capabilities for approved

existing or emerging technologies.		<p>MWRA devices. This created the foundation for a uniform wireless experience for MWRA users with approved devices.</p> <ul style="list-style-type: none"> • A Secure file sharing application has been implemented which provides MWRA the ability to securely share large files internally and with external parties, as necessary.
C. Obtain feedback from users on satisfaction levels and desired new services and implement changes accordingly.	→	<ul style="list-style-type: none"> • Continued meeting with ENQUAL and Lab Services. Met with Finance, HR, and Procurement in FY19.
D. Maintain current technology hardware, software, and network infrastructure.	→	<ul style="list-style-type: none"> • Deployed over 2000 updates to existing hardware and software throughout the year to ensure currency and mitigate vulnerabilities. • Upgraded over 900 MS Windows 7 PCs to Windows 10. This replaced PCs five years or older. • Upgraded Branch Office VPN equipment to provide for a more reliable and secure network connections for branch offices. • Upgraded the network link from Chelsea to Deer Island from 50 MB to 450 MB to provide required bandwidth to perform data transfers to meet business requirements.
E. Enhance Information Technology workforce capabilities through new certification and license requirements.	→	<ul style="list-style-type: none"> • Maintain a three-year rolling training plan in order to maintain staff skill sets. In FY19, staff were sent to 35 training classes, obtained 6 certifications and participated in 8 out-of-state conferences and 14 in-state conferences to ensure that the IT workforce capabilities are up to date.
F. 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.		<p>The following is a list of applications that were either updated or had functionality changes throughout FY19:</p> <ul style="list-style-type: none"> • DCR Web Application: The website went live and allows DCR users to access water quality data from the Quabbin and the Wachusett Reservoirs. • Water Conservation Fixtures and Literature Web Application: Went live in August and allows MWRA Service Area




	→	<p>residents to fill out a web form requesting low flow shower heads, faucet-aerators, dye tabs and/or brochures.</p>
	→	<ul style="list-style-type: none"> • ELN Phase 1 Improvements: The Electronic Lab Notebook (ELN) Improvements Project was completed in December adding new functionality to the existing phase one Water Quality (WQ) implementation. • Canto Cumulus Upgrade: Upgraded the Digital Asset Management Software used for managing MWRA photos/images. • AutoCAD Upgrade: Upgraded multiple individual software options to the BIM Suite to maintain support with drawing submitted by contractors and compatibility with Windows10
<p>G. 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.</p>		<ul style="list-style-type: none"> • Completed user testing of Archiving and Purge and e-Discovery of several pilot systems and none were found to be appropriate for MWRA’s needs. MIS is researching a new Archive and Purge solution with our current backup software vendor.
<p>H. 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.</p>	→	<ul style="list-style-type: none"> • Print, Fax, Scan and Copy: Installed new multi-function devices (MFDs) throughout MWRA facilities consolidating services (Print, FAX, Scan, Copier) onto one platform.
<p>I. Improve the organization of Information Technology and the oversight processes for selecting and implementing IT solutions throughout the MWRA.</p>	→	<ul style="list-style-type: none"> • Information Technology Steering Committee: The Business-IT Project Prioritization Committee, made up of senior staff representing the Authority’s Divisions established in FY17 continues to meet quarterly to assess project progress and set priorities.

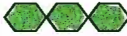




		<ul style="list-style-type: none"> Standardized documentation templates for the development and implementation of IT Systems are now being included as required documentation in IT Services Contracts.
J. Implement real-time SSO reporting system to provide public information and ensure reporting timeframes meet regulatory requirements.		<ul style="list-style-type: none"> Streamlined SSO field data collection is in progress. The collection application is available and has been field tested once. Upon completion of the ArcGIS Server upgrade, the application will be able to validate that required fields are entered. The field data collection portion of this project will be completed in FY20 Q1.
K. Implement Enterprise Content Management for e-Construction and e-Engineering and Documents/Records Management		<ul style="list-style-type: none"> Continued working on documenting existing use cases and work flows for E&C Department and Records Management processes, and designing conceptual requirements for a management dashboard.

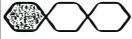
V. Environmental Sustainability

Goal #15: Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA's energy assets.		
Objective	2019	Highlights/ Progress Updates
A. Continue to conduct energy audits at all facilities and establish regular audit schedules.	→	<ul style="list-style-type: none"> • Energy audit conducted for DITP North Main Pump Station during FY18. Rehabilitation and coating of Pump #9 was recommended. • Energy audits of all other Operations facilities (e.g. water and wastewater pump stations, CSOs, office buildings, etc) substantially complete in Metro Ops, but on-going in Western Ops. Lighting audits of facilities in NGRID territory including Carroll and Clinton were completed in FY19. Recommendations are expected in Q1 of FY20.
B. Optimize processes to save energy.	→	<ul style="list-style-type: none"> • Work continues on identifying processes that can be optimized to save energy.
C. Incorporate energy efficiency into new construction, rehabilitation projects, and equipment replacement.	→	<ul style="list-style-type: none"> • Chelsea Creek Headworks upgrade, Contract 7161, is on-going and contains several energy efficiency components including LED lighting, occupancy sensors, a building energy management system, and VFDs on the odor control fans, HVAC, and hot water pumps. • Wachusett Pumping Station was constructed as a zero net energy facility using solar panels, geothermal heating, and high efficiency building design features. The solar arrays at the pump station became operable at the end of FY19. • Refurbish and coat North Main Pump 9 to increase pump efficiency with Eversource Incentive. This work will be completed early in FY20. • Natural gas was installed as part of facility rehabilitation projects to replace oil at Chelsea Creek HW, Alewife Brook PS, Caruso PS, and Clinton WWTP.




		<ul style="list-style-type: none"> Commonwealth Ave. Pumping Station Improvements will include LED lights in Control Room and restrooms, premium efficiency motors, higher efficiency HVAC equipment and a building automation system.
D. Continue to invest in the production and utilization of cost effective renewable energy at MWRA facilities.	→	<ul style="list-style-type: none"> The Brutsch Hydroelectric Facility came on-line in FY18. It is a Qualified Facility under the Renewable Portfolio Standard. Since it came on-line, Brutsch Hydro has generated approximately 552,230 kWh. In FY19, MWRA applied and was approved to participate in the new small hydroelectric net metering program for both Loring Road Hydro and the Brutsch Hydro.
E. Continue to reduce greenhouse gas emissions that result from MWRA operations.	→	<ul style="list-style-type: none"> Through implementation of energy efficiency projects, use of renewable energy sources, and low emission technologies, such as electric vehicles, MWRA continues to reduce its GHG emissions. From 2006 through 2018, MWRA has reduced its GHG emissions by about one third. MWRA continues to implement measures consistent with Governor Baker's Executive Order 569, "<i>Establishing an Integrated Climate Change Strategy for the Commonwealth</i>", by purchasing lower emissions fleet vehicles. In FY19, MWRA purchased one All-Electric SUV, three Plug-in Hybrid Electric SUVs, five diesel SUVs and three Flex-Fuel SUVs, and installed 2 charging stations in Southborough and one at the Carroll Water Treatment Plant, in addition to the two already located in Chelsea, to help reduce vehicle fuel emissions.
F. Continue to maximize revenue from generation assets.	→	<ul style="list-style-type: none"> In FY19, all green assets, with the exception of hydro were in operation greater than 92% of the time. Deer Island hydro assets were in operation 92% of the year, while FOD hydro assets were in operation between 88% and 91% of the time, with the exception of Oakdale, which was offline more in FY19 due to higher than normal rainfalls.

<p>G. Take full advantage of utility energy efficiency rebate opportunities.</p>		<ul style="list-style-type: none"> • Signed 3-year MOUs with NGRID and Eversource in FY19. This is the first MOU with NGRID and the second with Eversource. The MOUs are non-binding, but commit MWRA to continue to implement energy efficiency projects, while obtaining a higher incentive amount from the utilities. • Both Deer Island and the Carroll Water Treatment Plant continue to participate in the ISO-NE’s Demand Response Program, earning revenue for using back-up generation in the event of a power emergency.
<p>H. Incorporate employee education on energy efficiency in MWRA training outlets, e.g. tool box talks and HR training classes.</p>		<ul style="list-style-type: none"> • Staff developed outline of tool box talks for Metro and Western Ops staff. Talks are scheduled to be given FY20.
<p>I. 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.</p> <p>COMPLETED</p>		<ul style="list-style-type: none"> • Co-digestion on Deer Island was found to be financially unsustainable due to limitations on receiving material via barge. • Continuing to follow Greater Lawrence Sanitary District’s (GLSD) pilot co-digestion project to relate to DITP and Clinton WWTP in the future. The project at GLSD is progressing slowly due to a shortage of pre-processed food waste need to support the project. • The feasibility of conducting co-digestion at Clinton WWTP was evaluated and found to be not viable for two reasons – the process would increase the phosphorus loadings by a factor of 5 which would cause violations of Clinton’s new NPDES permit, and the existing generators are not equipped to use the extra gas generated, requiring significant capital upgrades.

<p>C. 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.</p> <p>COMPLETED</p>		<ul style="list-style-type: none"> • Staff participated with regional regulators and scientists on the development of an integrated Sentinel Monitoring Network (ISMN) identifying key datasets and parameters that can be used to identify climate change impacts. Existing MWRA monitoring data were identified as important long-term monitoring datasets in the ISMN plan, which was completed in FY17. • Distinguishing climate change impacts from potential effects of MWRA’s outfall in Massachusetts Bay, and how to best leverage the long-term environmental monitoring data set, was a major focus of the fall 2018 workshop held by the Outfall Monitoring Science Advisory Panel.
<p>D. Participate in regional activities aimed at preparing for the potential impacts of climate change and ensuring the resiliency of MWRA’s facilities.</p>		<ul style="list-style-type: none"> • MWRA is an active member of the Metro Mayors Coalition and has participated in several discussions and workshops to establish a common framework to prepare for the impacts of climate change. Staff are integrating this framework into MWRA’s planning initiatives and project reviews. • MWRA continues to work with key stakeholders, including the City of Boston, MassPort, UMass Boston and others, to share progress on vulnerability assessments and coordinate adaptation efforts.
<p>Goal #17: Advance reasonable water system expansion.</p>		
<p>Objective</p>	<p>2019</p>	<p>Highlights/ Progress Updates</p>
<p>A. Continue to provide assistance to communities seeking admission to the MWRA’s water system or seeking emergency withdrawals.</p>		<ul style="list-style-type: none"> • Provided assistance with the Water System Admission process to the following communities: Ashland, Burlington, Union Point/Southfield Redevelopment Authority, and Peabody. Note that only Burlington and Ashland are moving forward at this time.
<p>B. Work with prospective communities to inform them of the benefits of admission.</p>		<ul style="list-style-type: none"> • Work continues on this initiative through outreach to communities, watershed groups, and associations and through requests from consultants representing the communities.
<p>C. Advocate for a more streamlined regulatory review procedure, including expediting the Massachusetts Environmental</p>		<ul style="list-style-type: none"> • In the year ahead MWRA will prepare a donor basin application that once approved, can be utilized for all interbasin transfer requests in the future. Because Burlington

<p>Policy Act and Interbasin Transfer Act review process.</p>		<p>and Ashland are already in process, the donor basin application will be considered after their applications are complete.</p>
<p>D. Work with MWRA’s Advisory Board on legislative initiatives to pursue funding for connection assistance for new communities connecting to the water system.</p>		<ul style="list-style-type: none"> • Work with the Advisory Board continues.

Goal #18: 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.

Objective	2019	Highlights/ Progress Updates
<p>A. Continue to work cooperatively with DCR and cities and towns to ensure that these lands are available for appropriate public access.</p>		<ul style="list-style-type: none"> • Staff have participated in the DCR Land Acquisition Panel (LAP) offering guidance since 1995. The MWRA Board has had approval oversight of watershed land purchases under the CIP since FY07. Staff continue to be active in the LAP attending quarterly meetings and offering MWRA viewpoints on land purchases, preservation restrictions and disposition. <i>This update also supports Goal #1, assisting MWRA to maintain drinking water quality.</i>
<p>B. Continue to work with cities and towns to implement the Public Access Initiative on the Wachusett, Weston, Sudbury, and Cochituate Aqueducts.</p> <p>This program creates a partnership between MWRA and communities that host each piece of infrastructure, granting access to applicant communities to use MWRA controlled aqueduct right-of-ways of the Cochituate, Sudbury, Wachusett, and Weston Aqueducts, along with the lands surrounding the Weston and Norumbega distribution reservoirs.</p>		<ul style="list-style-type: none"> • The MWRA Aqueduct Trails Program is an innovative initiative that has opened up new recreational opportunities in communities across Metro West on appropriate MWRA aqueduct infrastructure. • Since 2011, MWRA staff have been working with aqueduct communities to provide technical assistance through the 8(m) permit process and have had great success opening access to these resources for the first time. • To date, MWRA staff have issued many Section 8 (m) Permits as part of the Aqueducts Trails Program authorizing approximately 30 miles of Aqueduct Trails. MWRA estimates that approximately 23 miles are currently open to the public.
<p>C. Continue to provide public access to Boston Harbor at Deer and Nut Islands, while ensuring</p>		<ul style="list-style-type: none"> • The Division of Marine Fisheries permitting for the Deer Island pier was completed in the Spring of 2017 then rebid in late 2018. A notice to proceed was issued in late FY19 to

appropriate security for MWRA's operations.		start construction of the pier with different parking options that addressed neighbor concerns about open space construction.
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STAFF SUMMARY


TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: FY19 Fourth Quarter Orange Notebook



COMMITTEE: Administration, Finance & Audit

INFORMATION
 VOTE

Carolyn M. Fiore, Deputy Chief Operating Officer
Stephen Estes-Smargiassi, Director, Planning & Sustainability
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

For information only. The Quarterly Report on Key Indicators of MWRA Performance (the Orange Notebook) is prepared at the close of each quarter of the fiscal year.

DISCUSSION:

The Orange Notebook presents performance indicators for operational, financial, workforce, and customer service parameters tracked by MWRA management each month. Noteworthy outcomes for the fourth quarter and the fiscal year are highlighted below.

Clinton Wastewater Treatment Plant

Staff have successfully started up the new phosphorus removal facility at the Clinton Wastewater Treatment Plant, meeting the new more stringent seasonal total phosphorus limits that became effective April 1, 2019. The plant uses chemical coagulation and flocculation coupled with the use of disk filters to remove phosphorus. While the filters have added numerous operational challenges, including increased maintenance for the new facility, and downstream operational impacts due to disk filter backwashing cycles causing significant flow fluctuations, the plant has consistently met the new NPDES phosphorus limits. (See page 30)

The plant experienced a total of fourteen NPDES permit exceedances in FY19, eleven of which were due mainly to high flows. The permit-required 12-month rolling average flow limit has not been a problem since 2012. High rains since October 2018 have increased community inflow and infiltration (I/I) causing exceedances of this flow limit 8 months in a row (since November). All flow received from Clinton and Lancaster was fully treated and the high flows did not cause any Sanitary Sewer Overflows. The plant was designed for higher rates of flow than have been permitted. Staff provide Clinton and Lancaster an annual I/I report detailing how much non-sanitary flow enters their systems. The higher plant flows have not resulted in excess nutrient loading to the river, and in fact, total loading is now substantially lower than it has been historically.

Additional permit exceedances triggered by high flows include a Total Suspended Solids weekly loading limit exceedance in November, and two chlorine residual limit exceedances that occurred during high flow periods despite the addition of seven times the required dechlorination chemical. Staff believe the issue may be due to "short-circuiting" of flows and incomplete mixing. Staff have

worked with the vender to change how the disk filter backwash is done to reduce flow variability, and will be performing a dye test of the basin to evaluate options to improve mixing.

There was one *E. coli* daily geometric mean exceedance in February due to equipment failure. A biochemical oxygen demand loading limit exceedance in June occurred due to an industrial discharge that caused a one-day spike that affected the entire week's average loading. A whole effluent toxicity (WET) test exceedance occurred in June with no apparent cause. Occasional WET test exceedances can occur due to the complex nature of this test, which is biologically based, and therefore inherently volatile with substantial statistical variability. All plant unit operations were operating properly, no influent spikes were observed, and effluent monitoring did not show any elevated concentrations of pollutants that can cause toxicity at the time of the test. (See page 30)

Worker Safety Reporting

With changes in state law, in February 1, 2019 MWRA began record keeping and reporting according to Federal OSHA standards for injury and illness record keeping. Strictly adhering to the federal OSHA reporting regulation has caused an increase in recorded injuries and illnesses, as shown on the chart on page 45. This increase is causing both the Recordable Injury and Illness Rate and the Lost Time Injury and Illness Rate to trend higher than in past years, but does not necessarily mean there is an increase in injuries or illnesses. OSHA injuries and illnesses, and lost time are recorded differently than the Massachusetts Workers' Compensation standards and could result in an apparent increase in the OSHA rate even while the Workers' Compensation claims are decreasing. Staff expect that over time, the rise on the charts should level off. (See page 45)

Water Distribution System Valves

In addition to continuing to meet the target of having at least 95 percent of each category of distribution system valves operable (as reported on last quarter), over this fiscal year staff met or exceeded targets for main line and blow-off valve exercising and replacement. (See page 9)

Wastewater Pipeline and Structure Inspections and Maintenance

Staff met all targets for pipeline, structure and siphon inspections, as well as targets for pipeline and siphon cleaning, and manhole rehabilitation during this fiscal year. (See page 10)

Drinking Water Complaints

Overall complaints were relatively low during this fiscal year. May had two specific events which contributed to an uptick of customer calls: an MWRA valve operation which resulted in 70 low or no pressures calls in Arlington that were resolved quickly, and over two dozen discolored water calls in Marblehead due to local fire department hydrant flushing. (See page 25)

Algae levels were relatively low during the quarter with no related complaints. Due to algal blooms in Quabbin and Wachusett Reservoirs, next quarter's Orange Notebook will report on a substantial number of taste and odor calls from the three Chicopee Valley Aqueduct communities, as well as proactive steps, including increasing the ozone dose at the Carroll Water Treatment Plant, taken in the metro Boston system. (See page 25)

MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

for

Fourth Quarter FY2019

Q1	Q2	Q3	Q4



Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
September 18, 2019

Board of Directors Report on Key Indicators of MWRA Performance

Fourth Quarter FY19

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This quarterly report is prepared by MWRA staff to track a variety of MWRA performance measures for routine review by MWRA's board of directors. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for internal management use and is subject to correction and clarification.

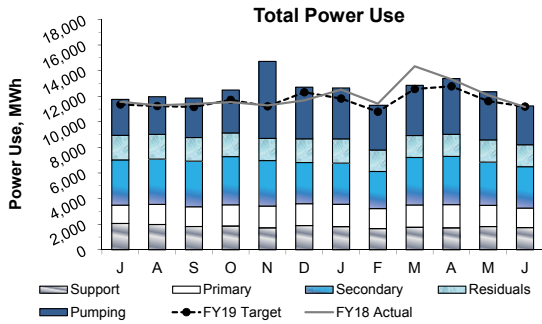
Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
September 18, 2019

OPERATIONS AND MAINTENANCE

Deer Island Operations

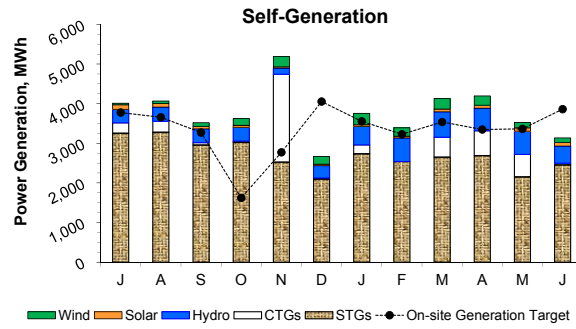
4th Quarter - FY19

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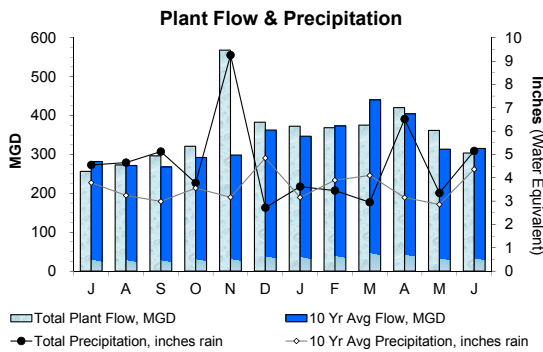


Total power usage in the 4th Quarter was 3.9% above target as Total Plant Flow was 4.2% above target with the 3 year average plant flow. As expected, power usage for raw wastewater pumping and for a number of plant processes were above target as a result of the higher plant flow. **Overall, total power usage in FY19 was 6.8% above target as total plant flow was 16.8% above the 3 year average plant flow target.**

Note: Power usage projections are based on 3 year averages.

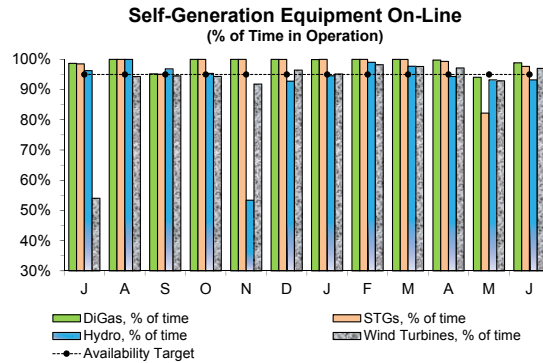


Power generated on-site during the 4th Quarter was 2.7% above target mainly due to higher-than-expected operation of the CTGs for nearly four (4) entire days in May to allow Eversource to perform work associated with the installation of the new power cable. As a result, power generated by the CTGs was more than two (2) times higher than expected. Power generated by the STGs was 6.6% below target due to both planned and unplanned maintenance shutdowns (for a control system interface upgrade and to repair a failed cross-tie bus bar in the Thermal Power Plant switchgear). Additionally, a problem with the STG prevented the operation of the steam system in vacuum mode, which would have allowed the BP-STG to produce an additional 1 MW of electricity during the month of June. While generation from the Hydro and Wind Turbines were both above target (10.1% and 5.8%, respectively), generation from the Solar Panels was 11.0% below target. **Overall, power generation was 12.9% above target for FY19.**

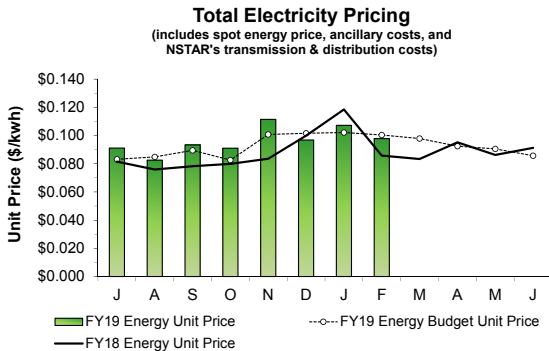


Total Plant Flow for the 4th Quarter was 5.1% above the budgeted 10 year average plant flow (361.9 MGD actual vs. 344.4 MGD expected) as precipitation was 44.8% above target (15.02 inches actual vs. 10.37 inches expected). Total Plant Flow was also 4.2% higher than the 3 year average plant flow used for energy budget projections. **Total Plant Flow in FY19 was 8.4% above target as precipitation was 27.8% above target.**

Note: Plant Flow and precipitation projections are based on 10 year averages but are 3 year averages for the energy budget projections.

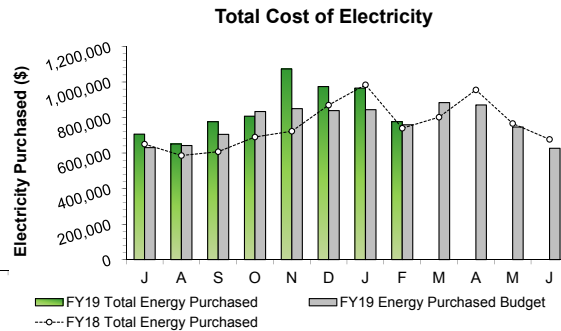


The DiGas system and Wind Turbines exceeded the 95% availability target for the 4th Quarter. The STGs fell below the 95% availability target due to a scheduled shutdown in the Thermal Power Plant (TPP) in May and an unanticipated failure of the cross-tie bus bar in the TPP that prevented operation of the STGs from May 26 to the afternoon of May 30. The Hydro Turbines fell below target due to several short maintenance required shutdowns, as well as extremely high plant flows during significant rain events which prevented hydro turbine operation.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Price in February (the most current invoice available) was 2.5% below target with budgetary estimates. The actual total energy unit prices in March, April, May, and June are not yet available as the complete invoices have not been received. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

Note: Only the actual energy prices are reported. Therefore, the dataset lags by four (4) months due to the timing of invoice receipt and review.



The Electricity cost data for Electricity Purchased in March, April, May, and June are not yet available. Year-to-date Total Cost of Electricity is \$628,237 (10.3%) higher than budgeted through February as the Total Energy Unit Price and the Total Electricity Purchased were both higher than target by 3.5% and 5.8%.

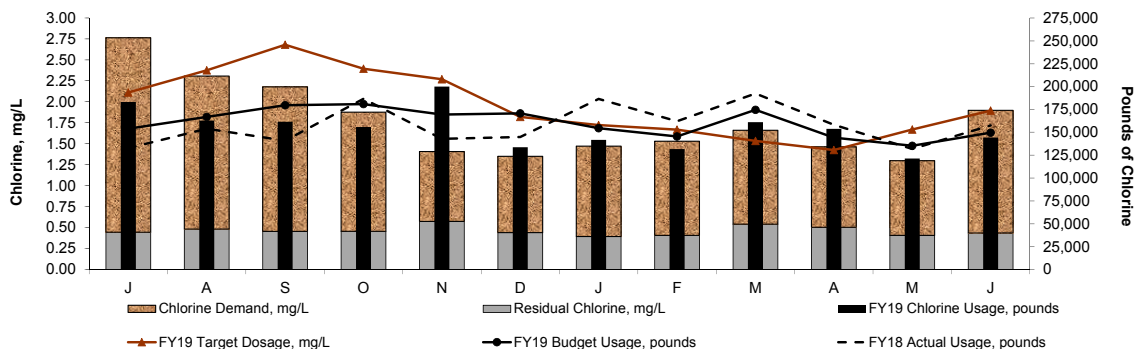
Note: Only months with complete Electricity Purchased data are reported. Therefore, the dataset lags by four (4) months due to the timing of invoice receipt and review.

Deer Island Operations

4th Quarter - FY19

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Deer Island Sodium Hypochlorite Use



The disinfection dosing rate in the 4th Quarter was 6.6% below budgetary target estimates. Actual sodium hypochlorite usage in pounds of chlorine was also 2.2% lower than expected. The lower sodium hypochlorite dosage and usage is indicative of a lower chlorine demand in the wastewater. DITP maintained an average disinfection chlorine residual of 0.45 mg/L this quarter with an average dosing rate of 1.55 mg/L (as chlorine demand was 1.10 mg/L). **Overall in FY19, disinfection dosing was 10% below target and sodium hypochlorite usage in pounds of chlorine was 3.8% below target.**

The overall disinfection dosing rate (target and actual) is dependent on plant flow, target effluent total chlorine residual levels, effluent quality and NPDES permit levels for fecal coliform.

Secondary Blending Events

Month	Count of Blending Events	Count of Blending Events Due to Rain	Count of Blending Events Due to Non-Rain-Related Events	Secondary, as a Percent of Total Plant Flow	Total Hours Blended During Month
J	1	1	0	99.5%	6.02
A	1	1	0	99.9%	2.96
S	2	2	0	99.4%	7.81
O	3	3	0	99.5%	9.58
N	12	12	0	96.2%	100.05
D	2	2	0	99.9%	4.39
J	1	1	0	98.9%	12.37
F	0	0	0	100.0%	0.00
M	0	0	0	100.0%	0.00
A	4	4	0	97.9%	45.42
M	1	1	0	99.97%	1.49
J	1	1	0	99.96%	1.79
Total	28	28	0	99.1%	191.89

99.2% of all flows were treated at full secondary during the 4th Quarter. There were six (6) secondary blending events due to high plant flow resulting from heavy rain. These blending events resulted in a total of 48.71 hours of blending and 265.63 MGal of primary-only treated effluent with secondary effluent. The Maximum Secondary Capacity for the entire quarter was 700 MGD.

Overall in FY19, 99.1% of all flows were treated at full secondary. There were a total of 28 separate secondary blending events in FY19; all due to high plant flows resulting from heavy rain, on occasion in combination with significant snow melt during the winter and spring. These secondary blending events combined produced a total of 191.89 hours of blending and 1,204.26 MGal of flow blended with secondary effluent.

Secondary permit limits were met at all times during the 4th Quarter.

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved an instantaneous peak flow rate of 1,165.1 MGD midday on April 22. This peak flow occurred during a storm event that brought 2.51 inches of rain to the metropolitan Boston area. Overall, Total Plant Flow in the 4th Quarter was 5.1% above the 10 year average plant flow target for the quarter.

Cleaning of the North Main Pump Station (NMPS) riser shafts began in April and continued into May. The ten-foot diameter North Metropolitan Relief Tunnel riser shaft and the eleven-foot diameter Boston Main Drainage Tunnel riser shaft were both cleaned out. A total of 13.09 tons of material was removed and disposed under the grit and screenings hauling and disposal contract. The removal of this floating material reduces the risk of pumping system malfunctions during low flow and pump-down events at the NMPS. This cleaning occurs twice a year.

Work on the Winthrop Terminal Facility (WTF) VFD (Variable Frequency Drive) and Synchronous Motor Replacement project was started by the contractor in 2018 and entails the demolition of existing older obsolete equipment (electrical systems, motors and VFDs on each of the six (6) raw wastewater pumps). The pumps are currently powered by 600 volts service and will be changed to 4,160 volts, consistent with other major pumps in both the South System Pump Station (SSPS) and the North Main Pump Station (NMPS). Work and all performance testing were successfully completed for WTF Pump #2 in June. The contractor began working on WTF Pump #5 on June 10. To date, work has been completed on two (2) of the six (6) pumps (#6 and #2).

Secondary Treatment:

Annual turnaround maintenance was performed on Train #2 at the Cryogenic Oxygen Facility in April. This turnaround maintenance is performed on roughly half of the components and systems in the Cryogenic Oxygen Facility. Train #1 was in operation and Train #2 remained in operation as well for most of the turnaround maintenance activities, but was taken out of service for portions of the maintenance that required the train to be offline. The same turnaround maintenance will be performed on Train #1 in the fall.

Deer Island Operations & Maintenance Report (continued)**Residuals Treatment:**

The rehabilitation of Gravity Thickener #1 under the major Gravity Thickener Rehabilitation project was completed in June and Gravity Thickener #2 was turned over to the contractors to begin work on June 17. The contractor also replaced the odor control dampers for several Gravity Thickeners in April with more to be replaced after the summer. This rehabilitation project will upgrade all six (6) gravity thickeners including complete replacement of each tank's sludge and scum thickening equipment as well as replacement of five (5) of the six (6) FRP dome covers (the FRP domed cover for Gravity Thickener #2 has already been replaced). The entire rehabilitation project is anticipated to take nearly three (3) years to complete.

Odor Control:

Activated carbon in carbon adsorber (CAD) unit #1 in the North Pumping Odor Control (NPOC) Facility, unit #2 in the East Odor Control (EOC) Facility, and unit #3 in the West Odor Control (WOC) Facility was changed out in May as part of routine practice to replace spent carbon.

Energy and Thermal Power Plant:

Overall, total power generated on-site accounted for 29.4% of Deer Island's total power use for the quarter and 30.3% for FY19. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 26.0% of Deer Island's total electrical power use for the quarter and 27.0% for FY19.

Progress on the installation for the new cross-harbor power cable continued through the quarter. This new cross-harbor power cable will replace the existing cross-harbor power cable that serves as the primary means of transmitting electricity to Deer Island, and is expected to be available near the end of this year. On April 11, DITP was taken off utility power for nearly 20 hours to allow Eversource to complete equipment installation at their K-Street location (Station 385). The CTGs were operated during this time to supply power to Deer Island. Also, the Eversource contractor completed the placement of the cable across Boston Harbor on April 28, when the new power cable was pulled from the Conley Terminal in Boston and reached Deer Island. In May and June, electrical switchgear upgrade work took place for both electrical buses within Eversource Station 132 on Deer Island. Power feed from each electrical bus to Deer Island was suspended by the utility at separate times to allow upgrade of the transformer and associated equipment for each electrical bus.

DITP experienced two (2) separate unanticipated partial plant power outages on the morning of May 26 and on the evening of May 27. The event on May 26 occurred as a result of a ground fault issue which caused the cross-tie bus bar located within the Thermal Power Plant to fail, tripping offline a number of pieces of equipment in the plant. Wastewater pumping was impacted only briefly and plant flow never completely stopped as the partial power loss only caused some pumps to trip offline. All other impacted equipment in the plant was subsequently restarted. The failed cross-tie bus bar however did prevent power from the single B-Bus feed from Eversource Station 132 (due to the Eversource work in progress) to be distributed to the plant's A-Bus. CTG-1A was placed into operation later in the day to power the plant's A-Bus, while the Station 132 B-Bus feed continued to power the plant's B-Bus. The failed cross-tie bus bar was repaired by staff and the unit approved for operation by the electrical contractor on May 30.

The partial power loss on May 27 occurred as a result of CTG-1A tripping offline while a voltage adjustment was being made during the operation of the CTG. This resulted in the unanticipated loss of power to the plant's A-Bus causing some plant equipment to trip offline. Again, wastewater pumping was impacted only briefly and never completely stopped as the partial power loss only caused some pumps to trip offline. CTG-1A was restarted to restore power to the plant's A-Bus. DITP remained in this configuration until Eversource completed this portion of work on June 6. CTG-1A was then taken offline and DITP returned to normal electrical configuration. No untreated wastewater was released at the Massachusetts Bay outfall during these events. There were no treated or untreated discharges from combined sewer overflows and no sanitary sewer overflows as a result of these events. No secondary process bypass occurred during these power failures. All sampling and test results from this time period indicate compliance with NPDES permitted effluent limits.

CTG-1A was operated for approximately two (2) hours on June 18 for an ISO-New England declared Demand Response summer audit event.

DITP took delivery of 420,000 gallons of #2 fuel oil, a total of 42 oil tanker trucks, without incident from April 16 through April 24. This fuel oil is used for CTG operation, for boiler startup operations, and for supplemental fuel for boiler operation during periods of low or unstable digester gas production.

Other items:

The Human Machine Interface (HMI) for DITP's Process Instrumentation and Controls System (PICS) was installed in 2011-2012 and was due for upgrade. The Notice To Proceed for this upgrade project was given to the HMI contractor in November 2018 and the preparatory work was performed at the contractor's facility since that time. The onsite upgrade work began this April with the anticipated completion to occur by the end of summer. This upgrade will provide the HMI system with the latest hardware, system software, and HMI system software. The plant's control system was unaffected by this upgrade work and the control of plant operational systems continued mostly as normal as the HMI upgrade was completed in phases. This upgrade solely impacts the HMI portion of the system, which is the computer interface part of the system that provides plant operational information to the operator and allows the operator to make operational changes from a workstation. The HMI upgrade in the Thermal Power Plant (TPP) on May 21 required a one (1) day shutdown of the boiler and the steam turbines. Staff, along with contractors, took this opportunity to perform a number of other essential maintenance projects, which could only be completed during a TPP shutdown, including the annual cleaning of the dump condenser. The majority of the onsite HMI upgrade work was completed by the end of May. Staff and the HMI contractor continue to work on punchlist items and additional ancillary scheduled upgrade work continues into July.

Clinton Treatment Plant:

Maintenance staff replaced the upper and lower belts on #1 Belt Filter Press, replaced rotor and stator on #1 Belt Filter Press Sludge Feed Pump, replaced #3 Waste Activated Sludge pump, and reinstalled the temporary Sodium Bisulfite Feed System. North and South Chlorine Contact Channels were drained, cleaned, and inspected.

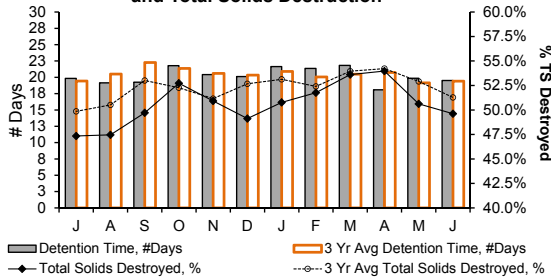
Clinton WWTP operated Phosphorus Reduction Facility with acceptable results for Fourth Quarter FY19. The pH meter on #1 train was calibrated in April. All three Disk Filters, troughs and nozzles were cleaned and inspected. In May, all three Disk filters were acid washed. Staff cleaned all three Disk Filters troughs and checked all nozzles in June.

Deer Island Operations and Residuals

4th Quarter - FY19

Page 4 of 4

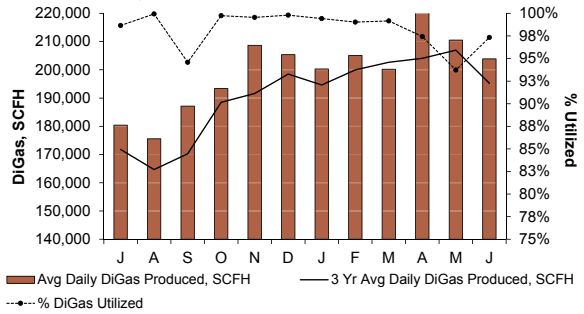
Sludge Detention Time in Digesters and Total Solids Destruction



Total solids (TS) destruction following anaerobic sludge digestion averaged 51.4% during the 4th Quarter, 2.7% below the 3 year average of 52.8%, as the sludge detention time in the digesters was 3.1% below target at 19.1 days. DI operated with an average of 8.0 digesters similar to the 3 year average. **Overall in FY19, TS destruction averaged 50.6%, which was 3.2% lower than the 3 year average of 52.3%. Sludge detention time was 20.2 days, similar to the 3 year average of 20.4 days.**

Total solids (TS) destruction is dependent on sludge detention time which is determined by primary and secondary solids production, plant flow, and the number of active digesters in operation. Solids destruction is also significantly impacted by changes in the number of digesters and the resulting shifting around of sludge.

Digester Gas Production and % Utilized

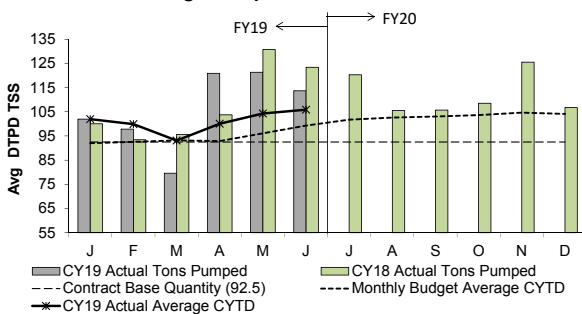


The Avg Daily DiGas Production in the 4th Quarter was 6.0% above target with the 3 Year Avg Daily DiGas Production. On average, 96.2% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant (TPP). The slightly lower Digas usage was due to a TPP maintenance shutdown and two (2) separate unanticipated partial plant power outages on May 26 and on May 27 that caused the DiGas system and boiler to trip offline. Additionally, there were periods during the quarter when Digas production exceeded the capacity of the TPP. **Overall in FY19, the Avg Daily DiGas Production was 4.8% above target, with an average of 98.2% utilization of DiGas at the Thermal Power Plant.**

Residuals Pellet Plant

New England Fertilizer Company (NEFCO) operates the MWRA Biosolids Processing Facility (BPF) in Quincy under contract. MWRA pays a fixed monthly amount for the calendar year to process up to 92.5 DTPD/TSS as an annual average. The monthly invoice is based on 92.5 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional payments are made on any quantity above the base amount. On average, MWRA processes more than 92.5 DTPD/TSS each year (FY19's budget is 98.9 DTPD/TSS and FY20's budget is 107.4 DTPD/TSS).

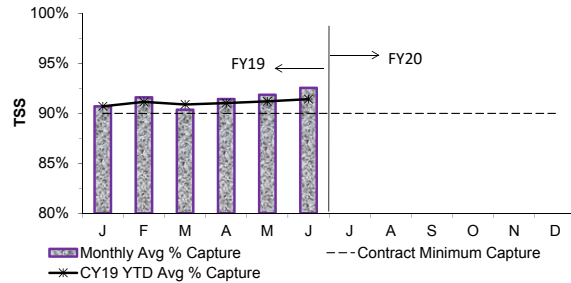
Sludge Pumped From Deer Island



The average quantity of sludge pumped to the Biosolids Processing Facility (BPF) in the 4th Quarter was 118.6 TSS Dry Tons Per Day (DTPD) - 12.5% above target with the FY19 budget of 105.5 TSS DTPD for the same period. Sludge delivered to the BPF was higher than expected in April and May but was lower than expected in June. The higher sludge pumped to the BPF is partly due to higher sludge and solids content and the resulting lower solids destruction.

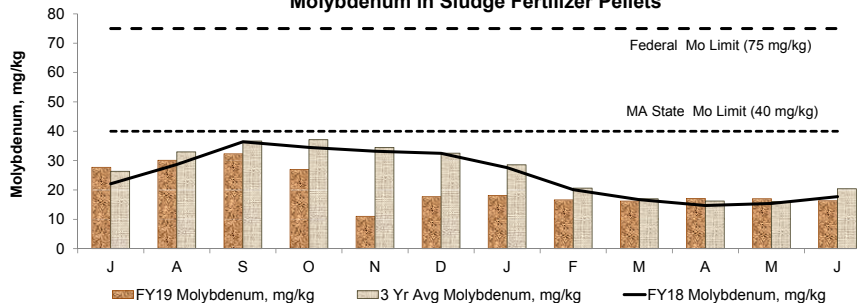
The CY19 average quantity of sludge pumped through June is 105.9 DTPD - 6.6% above target, compared with the CY19 average budget of 99.3 DTPD for the same time period.

Monthly Average % Capture of Processed Sludge



The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 4th Quarter was 92.0% and the CY19 to date average capture is 91.4%.

Molybdenum in Sludge Fertilizer Pellets



Copper, lead, and molybdenum (Mo) are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. Molybdenum-based cooling tower water is a significant source of Mo in the sludge fertilizer pellets. The Federal standard for Mo is 75 mg/kg. In 2016, Massachusetts Type I biosolids standard for molybdenum was changed to 40 mg/kg from the previous standard of 25 mg/kg. This has allowed MWRA to sell its pellets in-state for land application whereas the previous limits forced several months' worth of pellets to be shipped out of state. This made it an impractical source of fertilizer for local Massachusetts farms since NEFCO does not distribute product that does not meet the suitability standards.

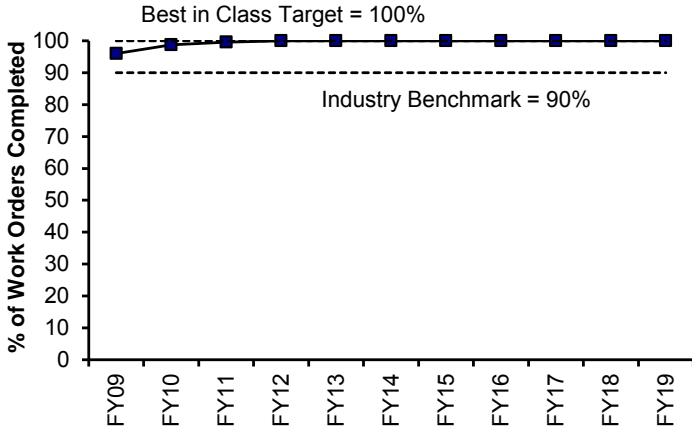
The levels have been below the DEP Type 1 limit for all three (3) metals. For Mo, the level in the MWRA sludge fertilizer pellets during the 4th Quarter averaged 16.8 mg/kg, 4% below the 3 year average, 58% below the MA State Limit, and 78% below the Federal Limit.

Deer Island Yearly Maintenance Metrics

4th Quarter - FY19

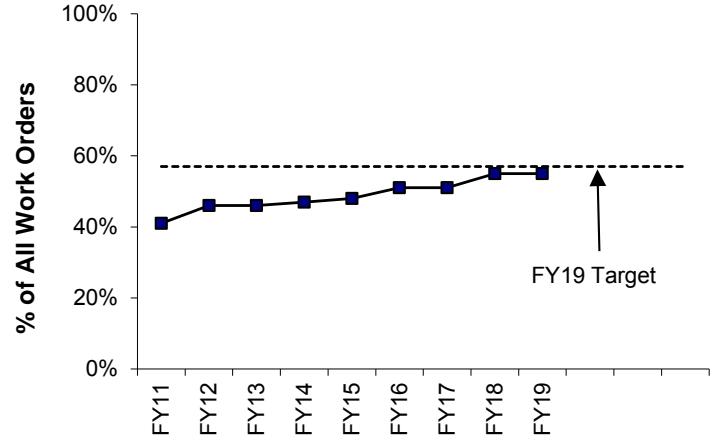
Proactive and Productivity Measures

Preventive Maintenance



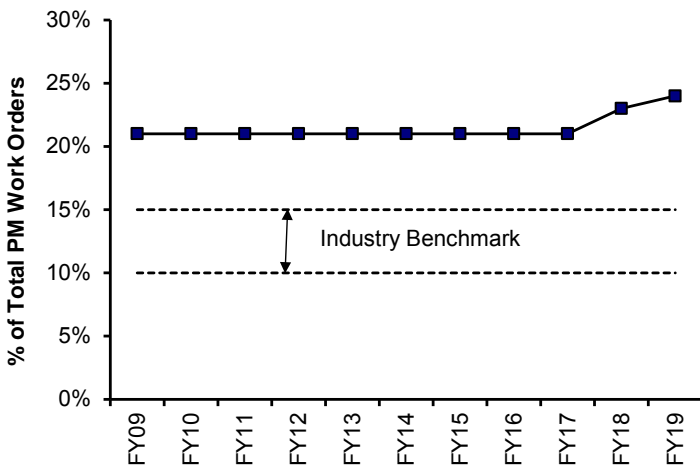
The industry benchmark is 90% for Preventive Maintenance (PM) completion. Upon reaching the 90% goal in FY05, the target goal was increased to the "Best in Class" Target of 100% PM completion. Since then, the percentage of PM work order completion has been at 99% or higher. Reliability-Centered Maintenance (RCM) and PM optimization efforts have continued since FY01. PM completion rate was 99.9% in FY19.

Maintenance Kitting



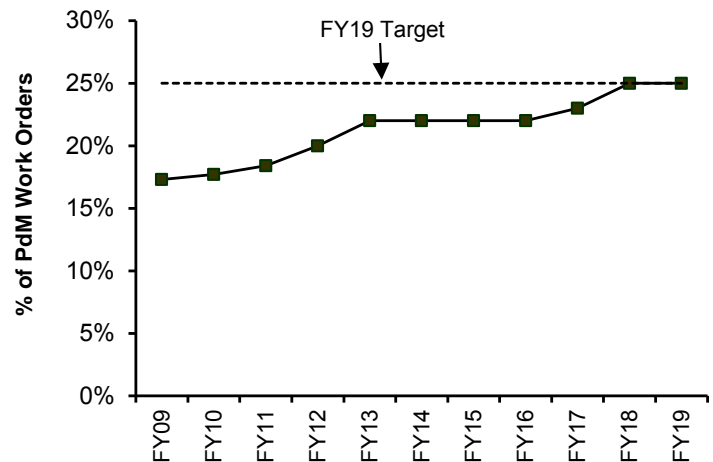
Preventive Maintenance (PM) inventory items were loaded into Maximo to assign spare parts for equipment to PM work orders. DITP reached the PM kitting goal of 100% in FY10. In FY11 a new graph (above) was developed to track kitting of all maintenance work orders in an effort to increase wrench time. Staff continues to fine-tune the process to "kit" all maintenance work orders. Kitting is considered a best practice by maintenance and reliability professionals. It entails staging parts necessary to complete maintenance work. Kitting allows maintenance staff to spend more time "turning the wrench" and less time waiting for parts at the stockroom window. Kitting for FY19 was 55%, just shy of DITP's new goal of 57%.

Operations Light Maintenance PMs



The percentage of preventive maintenance work order hours completed by Operations staff (not maintenance staff) increased from less than 1% in January 2002 to the current level of 24% in FY19. DITP reached the industry benchmark range of 10-15% in April 2003 and has exceeded the goal through FY19. Operations completes approximately 650 PM work orders per month.

Predictive Maintenance

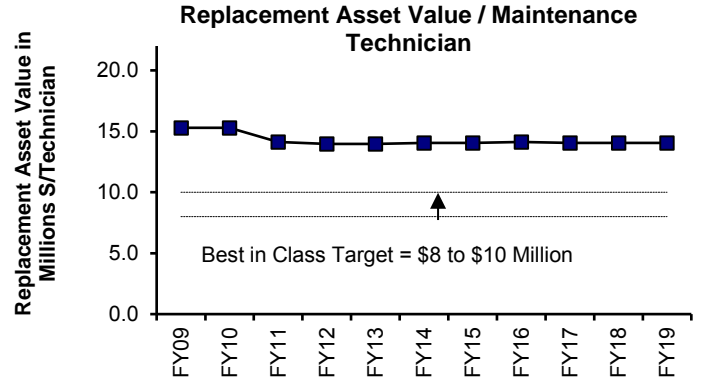
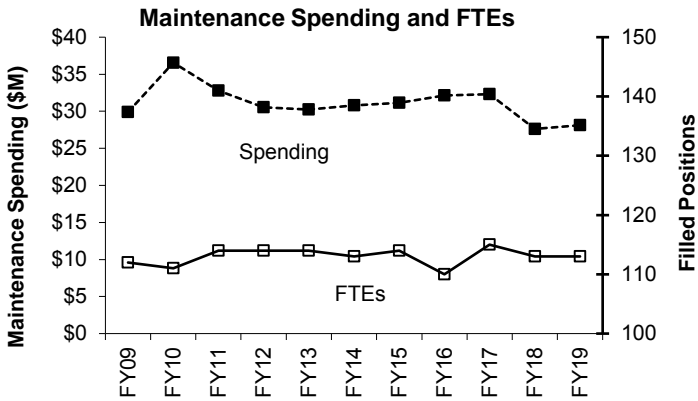


Predictive maintenance has steadily increased from 2% in FY03 to 25% in FY19, reaching DITP's FY19 new goal of 25%. The increase in predictive maintenance was achieved through the expanded use of lubrication, vibration, thermography, and acoustic ultrasonic testing techniques. The Condition Monitoring Group continually reviews and investigates new opportunities and initiatives to expand condition monitoring testing and analysis.

Deer Island Yearly Maintenance Metrics

4th Quarter - FY19

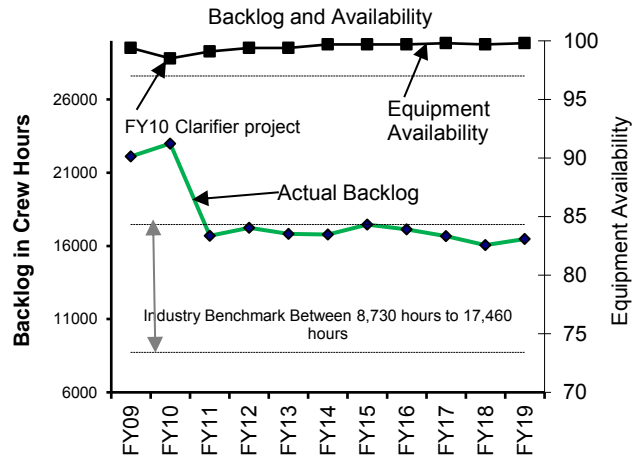
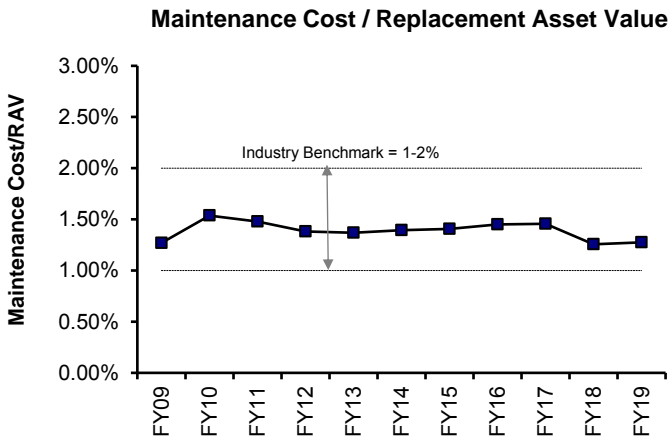
Overall Maintenance Program Measures



DITP's Maintenance staff is currently at 113 FTE's. Maintenance has been successful in meeting its goals through implementation of numerous maintenance efficiencies including: Operations staff performing light maintenance, cross-functional training and flexibility, and Reliability-Centered Maintenance.

DITP adopted a "best in class" target of \$8-\$10 Million/Technician for maintenance staffing. Even after a period of downward trending, DITP remains above this Best in Class target range. However, as the plant ages and additional equipment replacements are expected, DITP management will reassess staffing as needed.

The Maintenance Spending graph shows actual annual maintenance spending and large CIP asset replacements (equipment costs only). Maintenance budgeting continues to evaluate plant assets and requirements for replacement of obsolete equipment to ensure the plant operates at maximum efficiency. In FY19, overall spending increased slightly from FY18 due to some large Maintenance Projects; Winthrop Terminal Facility VFD/Motor Replacements, Gravity Thickener #1 Rebuild, MCC Switchgear Replacements, Scum Hopper Rebuilds, Exterior Door Contract and PICS Upgrades.



The industry benchmark for annual maintenance spending is between 1% to 2% of replacement asset value, currently DITP is at 1.28%. The plant's replacement asset value is calculated at approximately \$2.4 billion dollars. DITP's current maintenance spending is within the industry benchmark. As the plant ages and equipment replacement is required, spending is expected to increase. DITP Maintenance CEB spending is \$13.6 million coupled with CIP spending.

Industry benchmark for Equipment Availability is 97% and over the last ten years, equipment availability has consistently exceeded the benchmark. In FY19 the availability was 99.8%. The slight increase in Equipment Availability during FY19 was due to redundancy of equipment and effective/efficient maintenance practices. FY10's decrease was due to the Clarifier Rehabilitation Project.

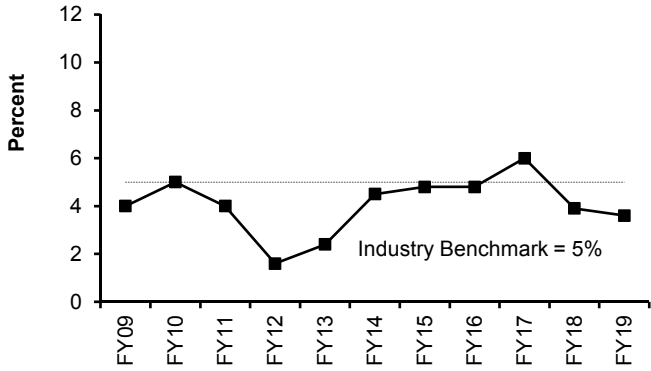
Industry Benchmark for Backlog is between 8,730 to 17,460 hours for maintenance based on current staffing, the total average backlog for FY19 was 16,480 hours, which is within the industry benchmark. The slight increase in Backlog is due to difficulty hiring trade staff.

Deer Island Yearly Maintenance Metrics

4th Quarter - FY19

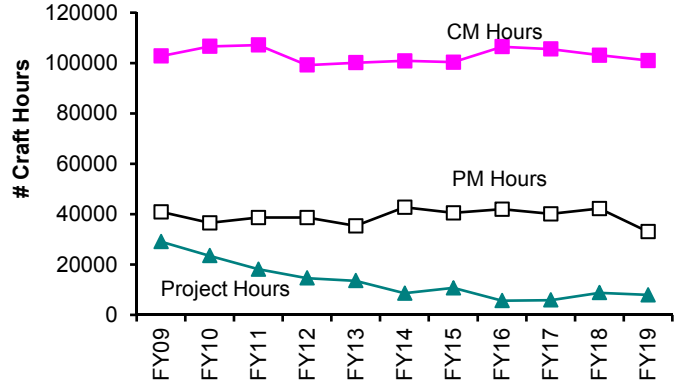
Overall Maintenance Program Measures (cont.)

Overtime (excluding Storm Coverage) as a Percentage of Wages & Salaries



Management continues its effort to keep overtime below the industry benchmark. DITP maintenance overtime was 3.6% for FY19. Management has taken steps to reduce overtime spending by limiting overtime to repair critical equipment and systems only. DITP has been on or under Industry Benchmark every year except FY17, due to the increase in overtime for the Eversource Cable Outage.

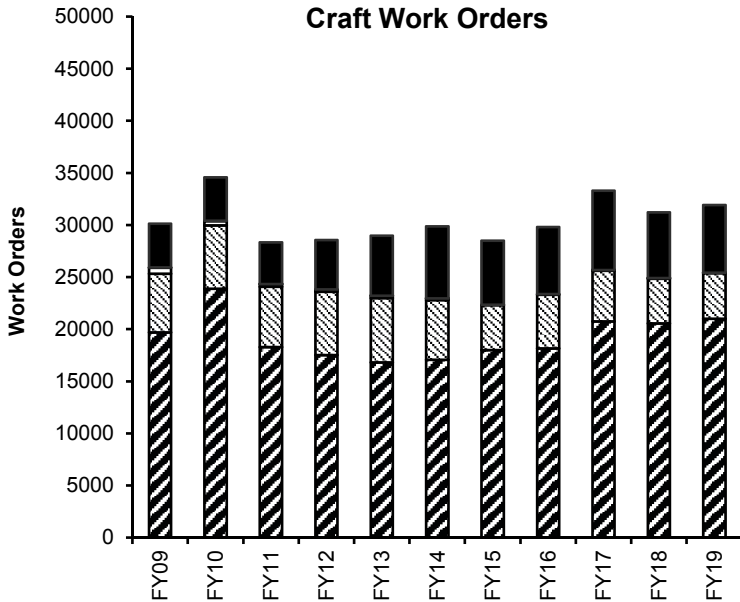
Craft Hours



Continued optimization of the Preventive Maintenance (PM) program through the transfer of some light maintenance tasks from Maintenance to Operations staff (increased to 24% of PM work orders in FY19), elimination of duplicate work orders, combining some PM's, increasing PM frequency due to equipment history and performance has resulted in a decrease in PM hours in FY19.

Corrective Maintenance (CM) hours slightly decreased from last year. Project Maintenance hours slightly decreased due to a number of CIP projects being completed: Winthrop Terminal Facility VFD\Motor Rebuilds, Gravity Thickener #1 Rebuild, MCC Switchgear Replacements, Scum Hopper Rebuilds, and Exterior Door Contract.

Craft Work Orders



During FY19, the number of work orders increased by 495 from the previous year. The increase in work orders was due to Planning Department entering new equipment (Operational Valves, Scum Hoppers, VFD Replacements, etc.) and setting up PM/PdM schedules, including increased visual inspections to identify issues at their onset. The number of Corrective Maintenance (CM) work orders increased slightly in FY19. Project (PROJ) work orders decreased for FY19 due to a number of CIP projects completed.

The Planning department is continuously modifying PM, PdM, and CM Job Plans to ensure maintenance is being performed efficiently and effectively, while ensuring reliability and availability of DITP's Assets.

- Predictive Maintenance □ Emergency Maintenance □ Project
- ▨ Corrective Maintenance ▨ Preventive Maintenance

Water Distribution System Valves

4th Quarter - FY19

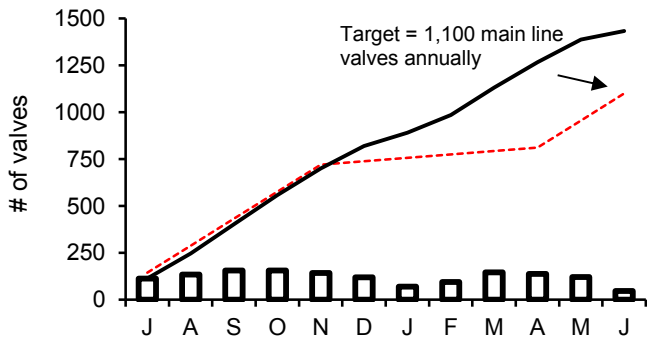
Background

Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but is often displaced during the construction season. This is due to the fact that a large number of construction contracts involving rehabilitation, replacement, or new installation of water lines, requires valve staff to operate valves and assist with disinfection, dechlorination, pressure-testing, and final acceptance. Valve exercising can also be impacted due to limited redundancy in the water system; valve exercising cannot be performed in areas where there is only one source of water to the community meters or flow disruptions will occur.

Type of Valve	Inventory #	Operable Percentage	
		FY19 to Date	FY19 Targets
Main Line Valves	2,159	96.8%	95%
Blow-Off Valves	1,317	98.6%	95%
Air Release Valves	1,380	95.1%	95%
Control Valves	49	100.0%	95%

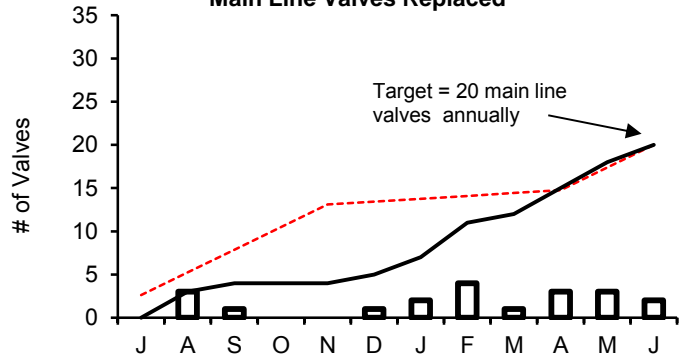


Main Line Valves Exercised



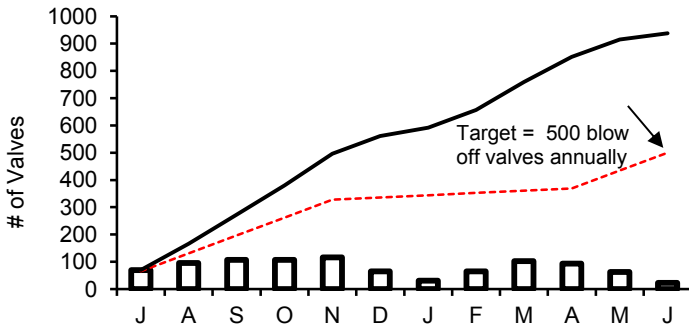
During the 4th Quarter of FY19, 303 main line valves were exercised. The total exercised for the fiscal year was 1,433. Main Line Valves Exercised have exceeded the target due to full staffing and CIP projects coming to completion.

Main Line Valves Replaced



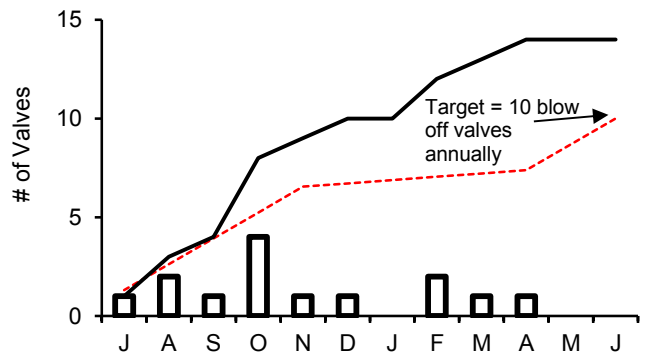
During the 4th Quarter of FY19, there were eight main line valves replaced. The total replaced for the fiscal year was twenty.

Blow-Off Valves Exercised



During the 4th Quarter of FY19, 179 blow off valves were exercised. The total exercised for the fiscal year was 938. Valve exercising has exceeded the target due to full staffing and CIP projects coming to completion.

Blow-Off Valves Replaced



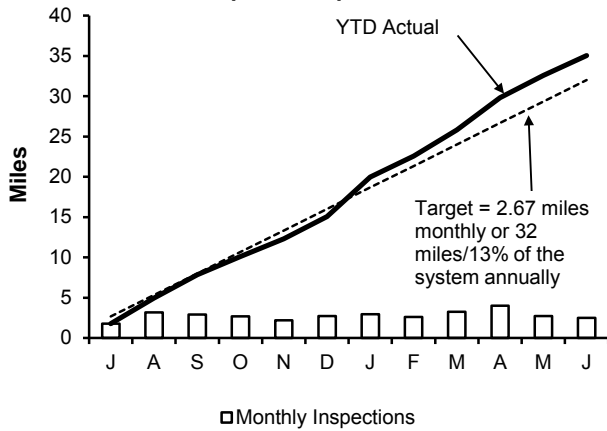
During the 4th Quarter of FY19, there was one blow off valve replaced. The total replaced for the fiscal year was fourteen. Blow off valve retrofit project schedules have been driven by requested community roadway reconstruction projects.

Wastewater Pipeline and Structure Inspections and Maintenance

4th Quarter - FY19

Inspections

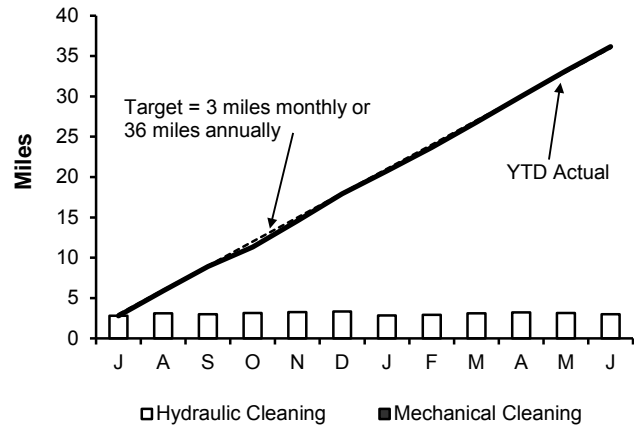
Pipeline Inspections



Staff internally inspected 8.79 miles of MWRA sewer pipeline during this quarter. The year to date total is 25.83 miles. No Community Assistance was provided this quarter.

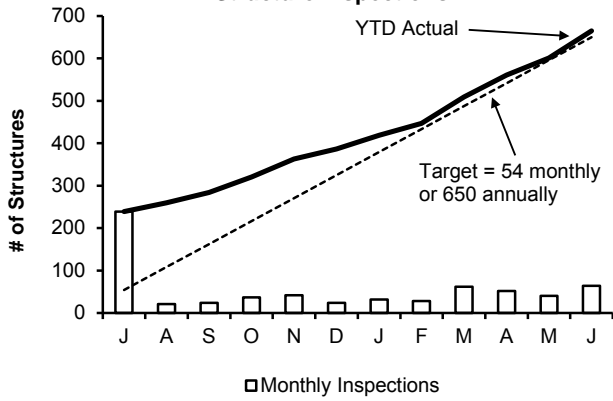
Maintenance

Pipeline Cleaning



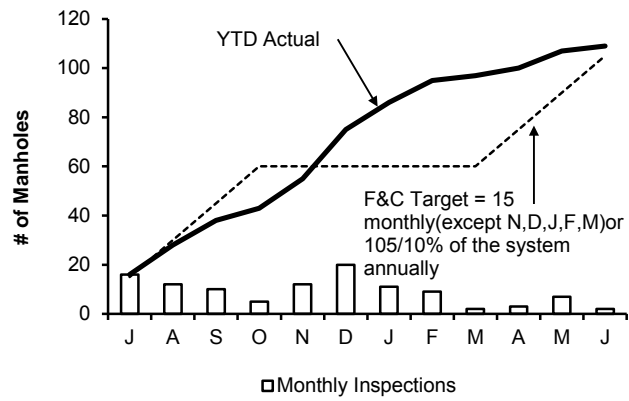
Staff cleaned 9.93 miles of MWRA's sewer system and removed 47 yards of grit and debris during this quarter. The year to date total is 36.17 miles. No Community Assistance was provided this quarter.

Structure Inspections



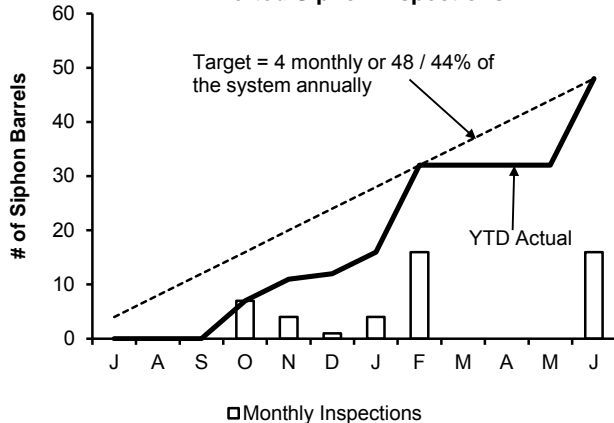
Staff inspected the 36 CSO structures and performed 86 additional manhole/structure inspections during this quarter. The year to date total is 655 inspections.

Manhole Rehabilitation



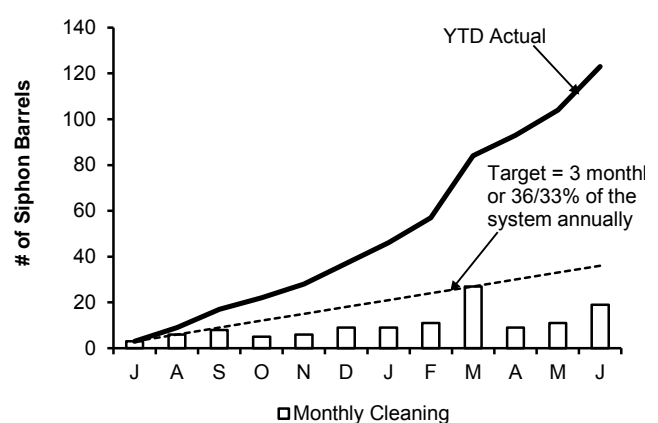
Staff replaced 12 frames & covers during this quarter. The year to date total is 109.

Inverted Siphon Inspections



Staff inspected 20 siphon barrels this quarter. Year to date total is 32 inspections.

Inverted Siphon Cleaning

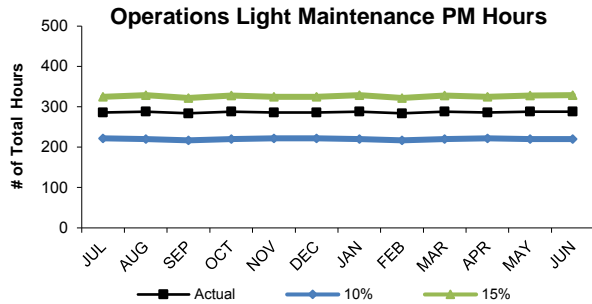


Staff cleaned 39 siphon barrels during this quarter. Year to date total is 123.

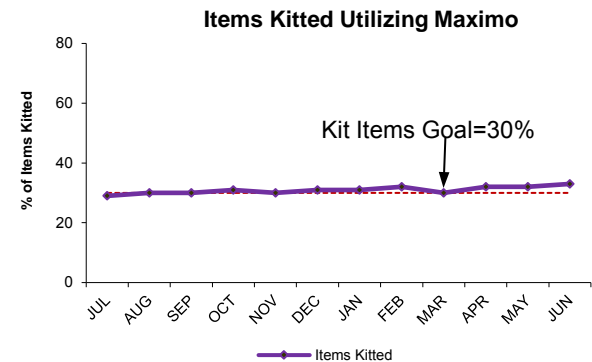
Field Operations' Metropolitan Equipment & Facility Maintenance

4th Quarter - FY19

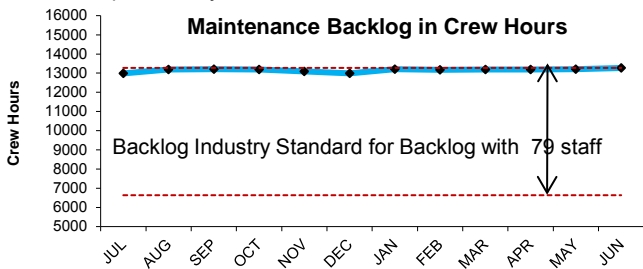
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus reducing maintenance spending. Backlog and overtime metrics monitor the success of these maintenance initiatives.



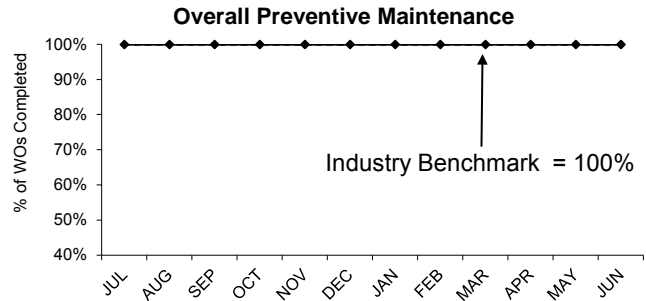
Operations staff averaged 287 hours of preventive maintenance during the 4th Quarter, an average of 13% of the total PM hours for the 4th Quarter, which is within the industry benchmark of 10% to 15%.



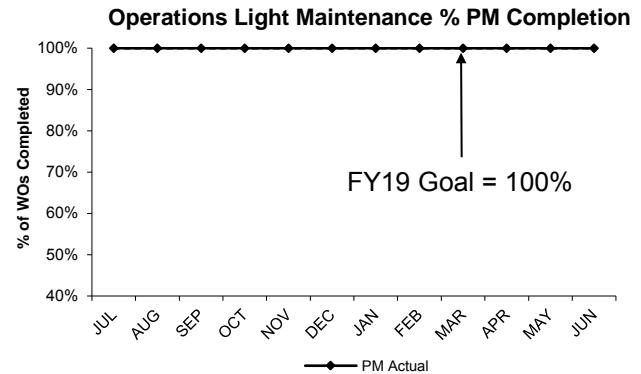
Operation's FY19 maintenance kitting goal has been set at 30% of all work orders to be kitted. Kitting is the staging of parts or material necessary to complete maintenance work. In the 4th Quarter, 32% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



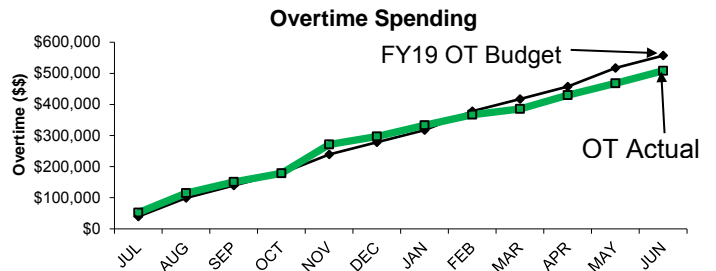
The 4th Quarter backlog average is 13224 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6636 to 13275 hours.



The Field Operations Department (FOD) preventive maintenance goal for FY19 is 100% of all PM work orders. Staff completed an average of 100% of all PM work orders in the 4th Quarter.



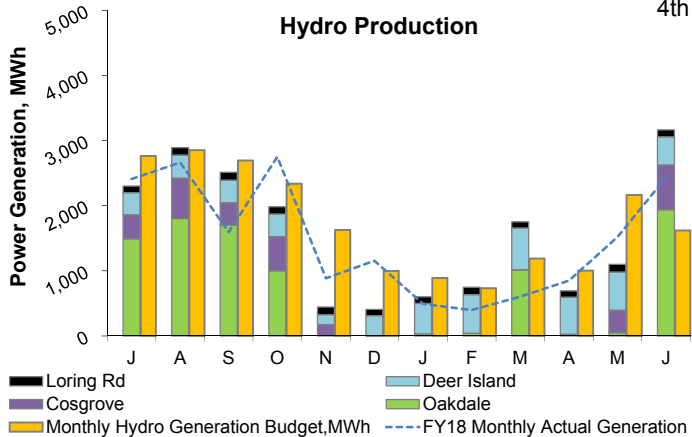
Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY19 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 4th Quarter.



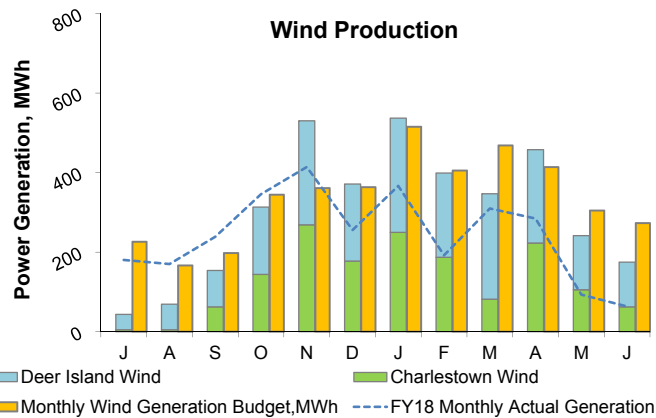
Maintenance overtime was \$20k under budget for the 4th Quarter. Overtime was used for critical maintenance repairs and wet weather events. Overtime for FY19 was \$508k which was \$49k under budget for the fiscal year.

Renewable Electricity Generation: Savings and Revenue

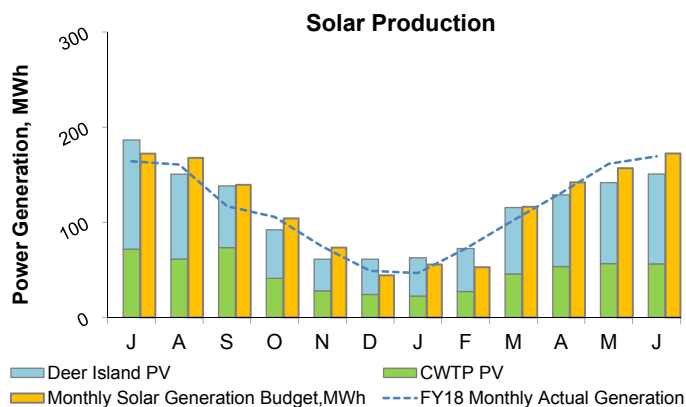
4th Quarter - FY19



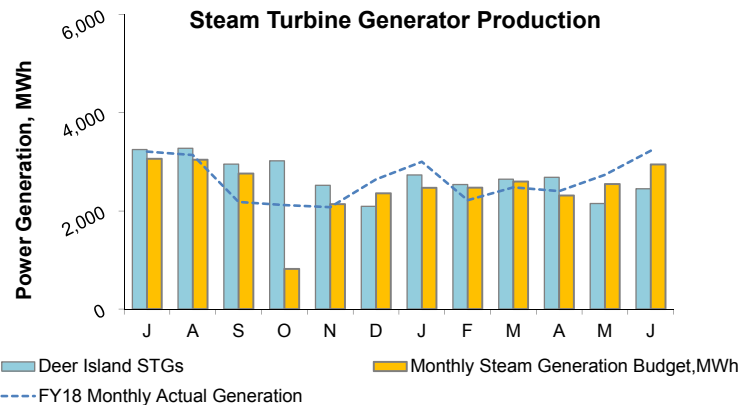
In the 4th Quarter, the renewable energy produced from all hydro turbines totaled 4,958 MWh; 4% above budget³. The total energy produced to date in FY19 is 18,609 MWh; 11% below budget³ primarily due to Cosgrove generation values having been underestimated by the utility company and Oakdale being offline. The utility data for Cosgrove is typically corrected and reconciled in later months of the year. The total savings and revenue² to date in FY19 (actuals through February¹) is \$786,414; 4% below budget³. The savings and revenue value does not include RPS REC revenue (see next page).



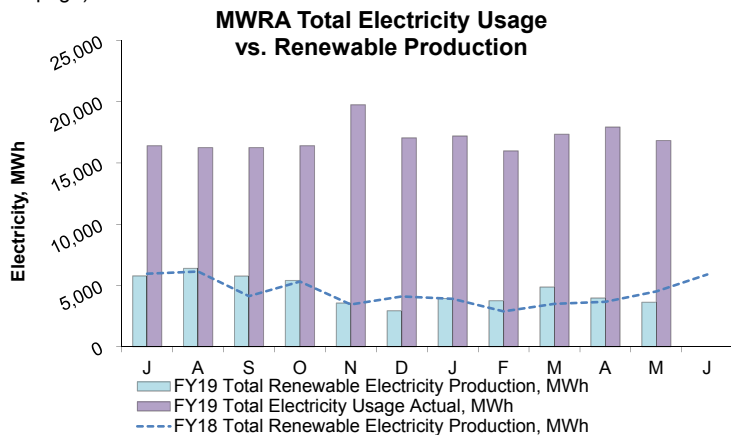
In the 4th Quarter, the renewable energy produced from all wind turbines totaled 874 MWh; 12% below budget³. The total energy produced to date in FY19 is 3,638 MWh; 10% below budget³, mostly due to Charlestown Wind generation values being underestimated by the utility company. The total savings and revenue² to date in FY19 (actuals through February¹) is \$363,530; 5% above budget³. The savings and revenue value does not include RPS REC revenue (see next page).



In the 4th Quarter, the renewable energy produced from all solar PV systems totaled 421 MWh; 11% below budget³. The total energy produced to date in FY19 is 1,361 MWh; 3% below budget³. The total savings and revenue² to date in FY19 (actuals through February¹) is \$109,161; 12% above budget³. The savings and revenue value does not include RPS REC revenue (see next page).

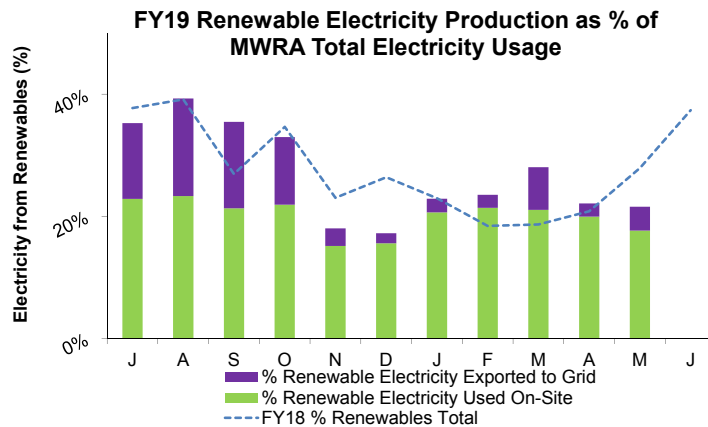


In the 4th Quarter, the renewable energy produced from all steam turbine generators totaled 7,291 MWh; 7% below budget³. The total energy produced to date in FY19 is 32,342 MWh; 9% above budget³. The total savings and revenue² to date in FY19 (actuals through February¹) is \$2,143,221; 27% above budget³. The savings and revenue value does not include RPS REC revenue (see next page).



In the first 11 months of FY19, MWRA's electricity generation by renewable resources totaled 50,006 MWh. MWRA's total electricity usage was approximately 187,468 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site at these facilities. Approximately 99% of FOD electrical accounts are accounted for by actual billing statements; minor accounts that are not tracked on a monthly basis such as meters and cathodic protection systems are estimated based on this year's budget.

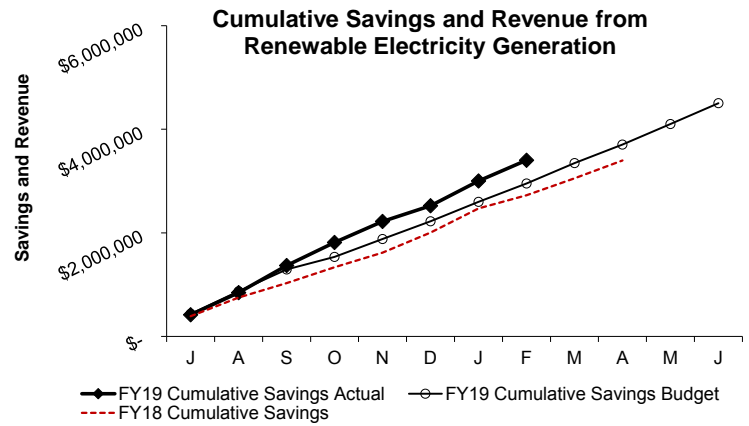
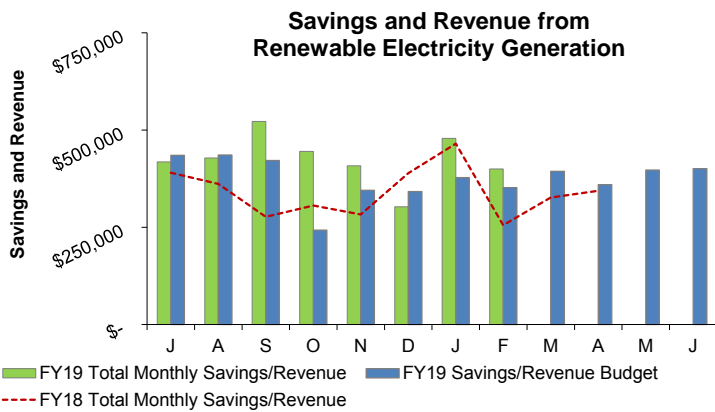
In the first 11 months of FY19, green power generation represented approximately 27% of total electricity usage. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.



- Notes:
1. Only the actual energy prices are being reported. Therefore, some of the data lags up to 2 months due to timing of invoice receipt.
 2. Savings and Revenue: Savings refers to any/all renewable energy produced that is used on-site therefore saving the cost of purchasing that electricity, and revenue refers to any value of renewable energy produced that is sold to the grid.
 3. Budget values are based on historical averages for each facility and include operational impacts due to maintenance work.

Renewable Electricity Generation: Savings and Revenue

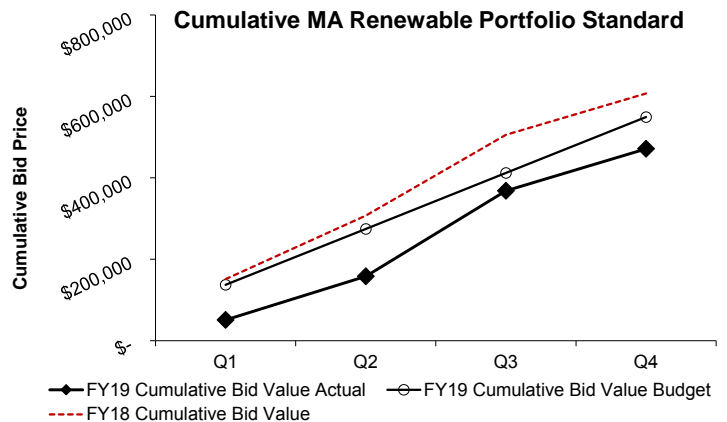
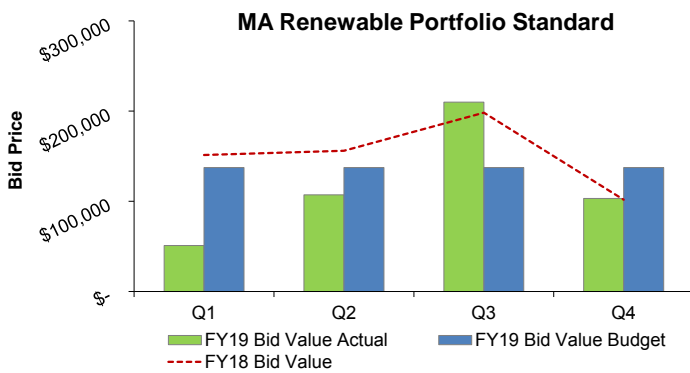
4th Quarter - FY19



Savings and revenue from MWRA renewable electricity generation in the first 8 months of FY19 (actuals only through February¹) is \$3,402,326; which is 15% above budget³.

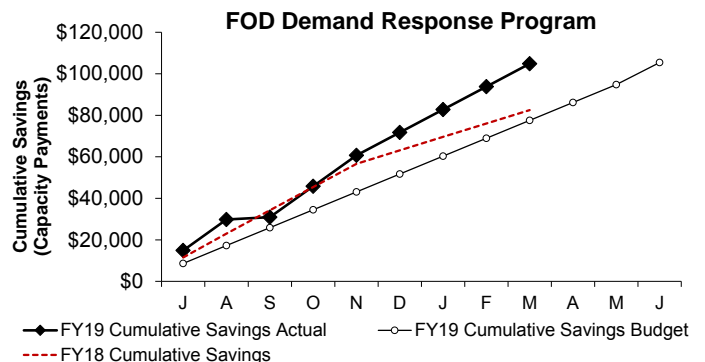
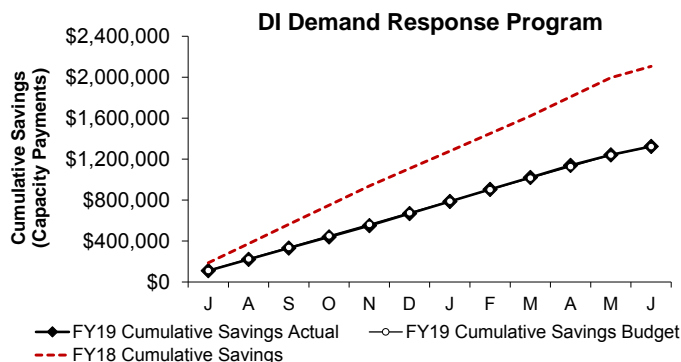
Savings and revenue² from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).

The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).



Bids were awarded during the 4th Quarter¹ from MWRA's Class 1, Class 2, and Solar REC renewable energy assets; 7,118 Q4 CY2018 Class I Renewable Energy Certificates (RECs), 1,400 Q4 CY2018 Class 2 RECs, and 40 Q4 CY2018 Solar RECs (SRECs) were sold for a total value of \$103,175 RPS revenue; which is 25% below budget³ for the Quarter. This is mostly due to Class 2 REC production being 48% under budget for the Quarter.

REC values reflect the bid value on the date that bids are accepted. Cumulative bid values reflects the total value of bids received to date.

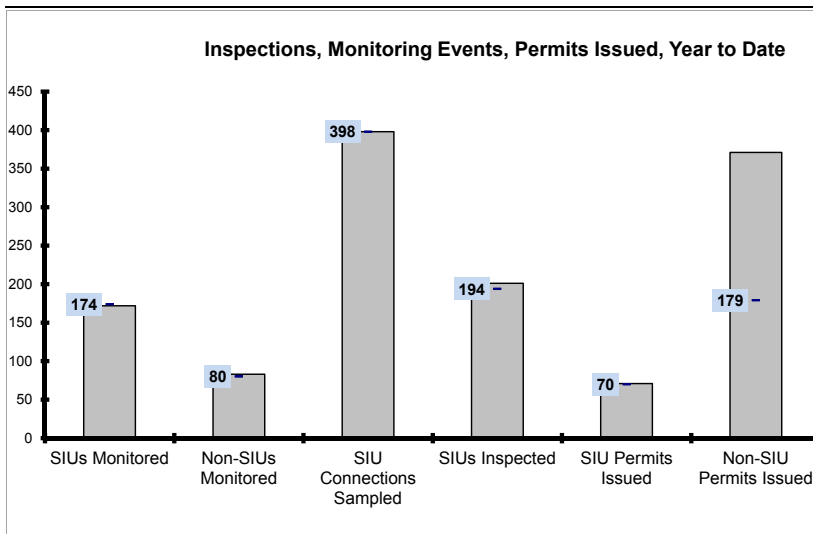


Currently Deer Island, JCWTP, and Loring Rd participate in the ISO-New England Demand Response Programs⁴. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY19 Cumulative savings (Capacity Payments only) total \$1,324,181 for Deer Island through June and \$104,859 for FOD through March¹.

- Notes:
1. Only the actual energy prices are being reported. Therefore, some of the data lags up to 2 months due to timing of invoice receipt.
 2. Savings and Revenue: Savings refers to any/all renewable energy produced that is used on-site therefore saving the cost of purchasing that electricity, and revenue refers to any value of renewable energy produced that is sold to the grid.
 3. Budget values are based on historical averages for each facility and include operational impacts due to maintenance work.
 4. Chelsea Creek, Columbus Park, Ward St., and Nut Island participated in the ISO Demand Response Program through May 2016, until an emissions related EPA regulatory change resulted in the disqualification of these emergency generators, beginning June 2016. MWRA is investigating the cost-benefit of emissions upgrades for future possible participation.

Toxic Reduction and Control

4th Quarter - FY19



EPA Required SIU Monitoring Events
for FY19: 174
YTD : **172**

Required Non-SIU Monitoring Events
for FY19: 80
YTD : **83**

SIU Connections to be Sampled
For FY19: 398
YTD: **398**

EPA Required SIU Inspections
for FY19: 194
YTD: **201**

SIU Permits due to Expire
In FY19: 70
YTD: **71**

Non-SIU Permits due to Expire
for FY19: 179
YTD: **371**

Significant Industrial Users (SIUs) are MWRA's highest priority industries due to their flow, type of industry, and/or their potential to violate limits. SIUs are defined by EPA and require a greater amount of oversight. EPA requires that all SIUs *with flow* be monitored at least once during the fiscal year. The "SIU Monitored" data above, reflects the number of industries monitored; however, many of these industries have more than one sampling point and the "SIU Connections Sampled" data reflect samples taken from multiple sampling locations at these industries.

During the compilation of monitoring events for March, an error was identified. Samples collected by two sample associates were not showing in TRAC's reports; as a result, monitoring events for the first half of the fiscal year were under reported. This error was corrected in the third quarter. TRAC monitored all but two SIUs in FY19; those two SIUs did not discharge during the fiscal year, thus no sampling was required.

TRAC's annual monitoring and inspection goals are set at the beginning of each fiscal year but they can fluctuate due to the actual number of SIUs. Monitoring of SIUs and Non-SIUs is dynamic for several reasons including: newly permitted facilities, sample site changes within the year requiring a permit change, non-discharging industries, a partial sample event is counted as an event even though not enough sample was taken due to the discharge rate at the time, increased inspections leading to permit category changes requiring additional monitoring events.

TRAC also monitors one-third of the non-SIUs each year. SIU and Non-SIU permits are issued with durations of two to five years, depending on the category of industry, varying the number of permits that expire in a given year.

	Number of Days to Issue a Permit						Permits Issued	
	0 to 120		121 to 180		181 or more		SIU	Non-SIU
	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU		
Jul	1	11	0	1	1	3	2	15
Aug	2	122	1	1	0	2	3	125
Sep	2	14	0	2	1	5	3	21
Oct	3	16	0	7	0	14	3	37
Nov	2	10	0	2	0	7	2	19
Dec	5	4	0	4	0	2	5	10
Jan	3	12	0	3	0	3	3	18
Feb	9	18	0	2	0	4	9	24
Mar	9	24	0	2	0	6	9	32
Apr	7	17	0	4	0	3	7	24
May	11	20	0	3	0	3	11	26
Jun	13	19	0	1	1	0	14	20
% YTD	94%	77%	1%	9%	4%	14%	71	371

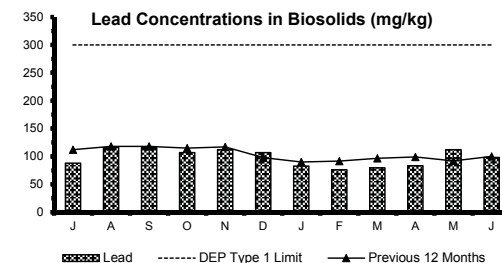
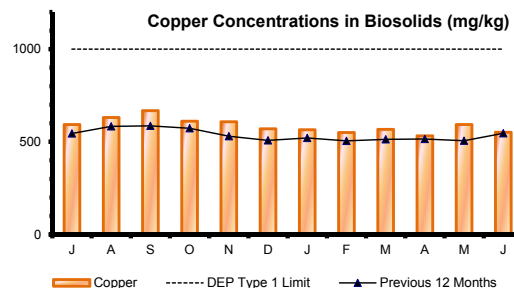
EPA requires MWRA to issue or renew 90% of SIU permits within 120 days of receipt of the application or the permit expiration date - whichever is later. EPA also requires the remaining 10% of SIU permits to be issued within 180 days.

In the 4th quarter of FY19, 34 permits were issued, 14 of which were SIUs. All but one of the 14 SIU permits were issued within 120 days.

For the FY19 fiscal year, 67 of the 71 SIU permits issued were completed in the 120-day timeframe with one of the remaining four completed within the 180-day timeframe and three beyond the 180-day period.

The workflow issues resulting from staff turnover earlier in the fiscal year were addressed. Some permit issuances exceeding 180 days can be attributable to circumstances out of the control of TRAC, such as: waiting for data from an industry, waiting for approval from the municipality in which the industry was operating or intended to operate, or the late payment of a permit fee.

One SIU permit was issued in this quarter for the Clinton Sewer Service area; in the fiscal year, three SIU permits were issued, all within the timeframe stipulated by the Clinton NPDES permit (90 days).



Copper, lead, and molybdenum are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer.

Copper and lead levels remain relatively constant, below the DEP Type 1 Limit, and within the range of values over the past several years. A discussion of molybdenum concentrations in biosolids is included in the Deer Island Residuals Pellet discussion.

Field Operations Highlights

4th Quarter - FY19

Western Water Operations and Maintenance

Grounds and Aqueducts Maintenance: Staff installed the new Aqueduct Trail Granite markers and began the seasonal mowing of the Aqueducts including the increased mowing of the designated public access trails.

Wachusett Dam: Staff supported engineering by providing access and input into the lower gatehouse piping replacement as well as Bastion Building structural repairs design projects. Staff made temporary repairs to the crest gate, raised the crest gate to the fully closed position, and initiated the evaluation process for making long-term repairs.

Flood Control: Staff monitored reservoir levels and river stream flow measurements and made necessary adjustments to keep the reservoirs within parameters and minimizing the impacts to downstream waterways during an exceptionally rainy spring.

.Metro Water Operations and Maintenance

Valve Program: Section 55 was filled, disinfected, and returned to service upon completion of work by an outside contractor. Valve operations were provided for in-house and CIP work. Staff supported the disinfection and activation of Bellevue Two Tank upon the completion of painting. Staff isolated and drained the Deer Island Tank to support the painting contractor. Deer Island's potable water system is being fed directly through PRVs. A 36-inch butterfly valve on Section 70 was repaired which allowed an isolation to repair a leak on the section, keeping Meter 205 in service. Staff deployed and set up a Mobile Pumping Unit at Lynnfield's pumping station as trial prior to upcoming support during the rehabilitation of their station. Refilling, flushing and activation of Meter 130 was completed. Northern Extra High service continues to remain normal with the Park Circle and Walnut Hill tanks in service during the repainting of Turkey Hill.

Water Pipeline Program: Work on the piping improvements at Meter 130 in Winchester to improvement flow capacity was completed by the end of the quarter. The work included connecting new piping to existing 14-inch piping downstream of the meter in the Winchester system, and the installation of three new valves. Work at the three coupling replacement locations and at the limit of work in Watertown on the Watertown Section pipeline was completed by the end of the quarter. New high-density polyethylene (HDPE) flanges were fused on to the ends of the existing pipe, and short flanged sections were installed to complete the repair.

Operations Engineering

Painting Turkey Hill and Bellevue No. 2 Standpipes: Turkey Hill tank remains isolated. The Contractor anticipates beginning disinfection at the end of July.

Painting Deer Island Water Storage Tank: Ops. Eng prepared the operation plan to isolation the tank. Prior to the Contractor taking over the tank, an isolation was conducted on June 19th. This was to ensure the PRV valves on Section 98 were working properly and there would be an uninterrupted water supply to Deer Island. The trial was successful and the tank was drained and turned over to the Contractor on June 24th.

Section 89/ 110 Emergency Action Planning (EAP)- Meeting held on 6/4 with impacted Northern Intermediate High communities to review the May 3rd water main break on Section 89 and the process and procedures that were conducted to isolate and repair the water main. This meeting was also to update the current EAP with the affected communities input. Section 110 when completed will be a redundant water main to Section 89, however, we still have a summer, high demand period to go through prior to its activation. Section 89 will then be isolated for a replacement/upgrade project. And while this happens, there will not be redundancy for Section 110. The EAP will be a contingency for either scenario.

Wastewater Operations & Maintenance

Remote Headworks Upgrades - Contract #7206: Channel #1 was turned over to the contractor for rehabilitation at the beginning of January 2018. Vendor training for channel #1 continued in April 2019. The 14-day acceptance test for Channel 1 was completed on 4/29/19.

Planned Utility Power Outage at Prison Point: Eversource had a planned utility power outage, for maintenance of their system, which affected the Prison Point CSO Facility on 4/11/19 to 4/13/19. Prison Point ran on facility generator power during this outage. A back-up portable generator was brought to the facility, in advance, as a precaution. Electrical and Operations staff were onsite for the duration of this outage. There were no operational impacts.

Wastewater OCC Improvements: Operations staff attended meetings and toured several operations control centers during the end of the quarter for the Wastewater OCC Improvements project.

Wastewater OCC: Operations staff successfully remotely operated the Wastewater OCC from the Carroll Treatment Plant on 5/2/19, as part of an emergency preparation drill.

Metro Equipment and Facility Maintenance

Hayes Pump Station: The station's permanent emergency generator experienced a catastrophic failure. Staff working with an outside vendor evaluated the generator and decided to rebuild the existing generator. MWRA staff working with a representative from the

Field Operations Highlights

4th Quarter - FY19

repair company removed the generator from the engine. MWRA's one Megawatt portable generator served as station emergency power while the station generator was repaired. Once repaired the generator was reinstalled, tested and returned to service.

Metering

Community Assistance: On 15 occasions Metering staff reached out to member communities to identify anomalies in meter data which could indicate community issues such as leaks. This included identification of a flow reversal situation in Somerville. Monthly flows have been corrected to account for this issue and a new fire bypass valve has been ordered to permanently correct the issue.

A temporary shutdown of the Meter 206 site provided additional insight to the partial supply of the Lynn GE plant site indicating that the estimation of Meter #206 may have been in correct. Through coordination with the Lynn Water and Sewer Commission (LWSC) and GE, MWRA came to an agreement to temporarily use GE plant meter readings to provide monthly readings.

Verizon 4G Upgrade project: Metering staff continued to make progress on this project. Through this past quarter, meter crews had replaced approximately 80 of 257 water meter sites to 4G modems in preparation of Verizon's planned shutdown of their 3G data network. Meter Engineering is on schedule to meet the goal of January 1, 2020 for full system replacement.

TRAC

Inspections and Permitting: This fourth quarter TRAC issued a total of 54 MWRA 8(m) Permits allowing companies to work within an MWRA easement or property. Permits were issued in an average of 71 days.

Environmental Quality-Water

Algae: MWRA's algae monitoring season began in May and will continue through early Fall. Grab sampling and buoy data is exchanged routinely with DCR and reviewed to assess if additional monitoring is necessary. Staff also attended an EPA Cyanobacteria Monitoring Collaborative meeting in May.

ENQUAL-Water staff performed algal toxin and taste and odor compound sampling at Cosgrove Intake Reservoir; Wachusett and Quabbin raw water; and treated water taps throughout the quarter. Testing revealed no detections of algal toxins.

Community Support: MWRA's biennial drinking water sampling training occurred throughout the quarter. Both EnQual and Department of Lab Services' staff work with the Training Department to train sampling staff from MWRA's fully served and partially served communities.

The sessions discuss chlorine residual testing, bacteriological sampling technique, and sample site investigations.

Environmental/Chemical Contract Management: Staff provided chemical delivery training throughout May to both wastewater and water treatment operators. Training focused on standard operating procedures, chemical acceptance testing, and safety.

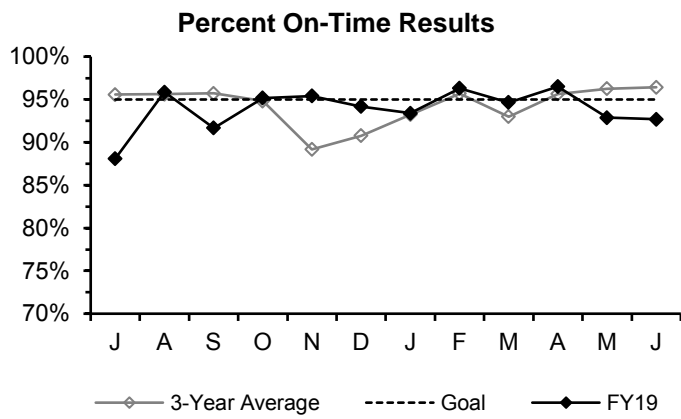
Environmental Quality-Wastewater

Ambient Monitoring: Between April and June MWRA's monitoring consultant conducted three regularly scheduled and five special red-tide surveys in Massachusetts Bay. The abundance of this organism triggered a Contingency Plan caution level threshold exceedance which was reported to regulators, the outfall monitoring science advisory panel, and the public on May 31. Levels of red tide increased weekly through June 19, and were at similar high levels on June 27. Red tide blooms in Massachusetts Bay commonly end between late June and early July.

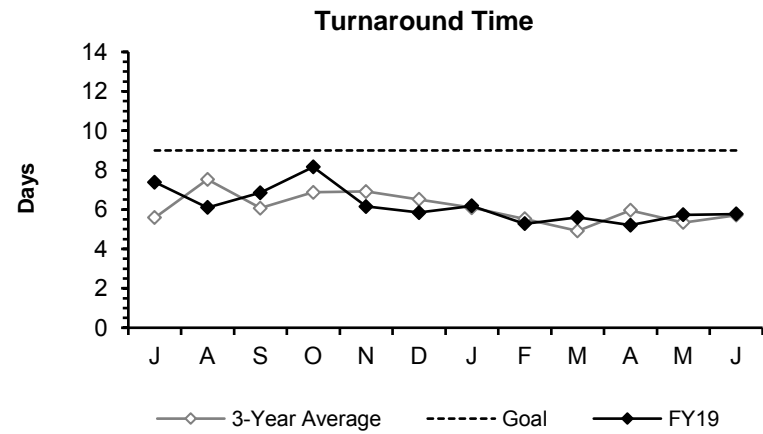
Staff participated in an Outfall Monitoring Science Advisory Panel meeting in April, which included guidance from the Panel on information needed for their review of changes MWRA may propose to modify the Ambient Monitoring Plan.

Harbor/CSO Monitoring: CSO receiving water monitoring sampling in support of the water quality standards variance and the CSO assessment continued, including post-storm sampling in the Charles and Alewife/Mystic. Posting of beach monitoring results on MWRA's web site began in late May and will continue through the swimming season.

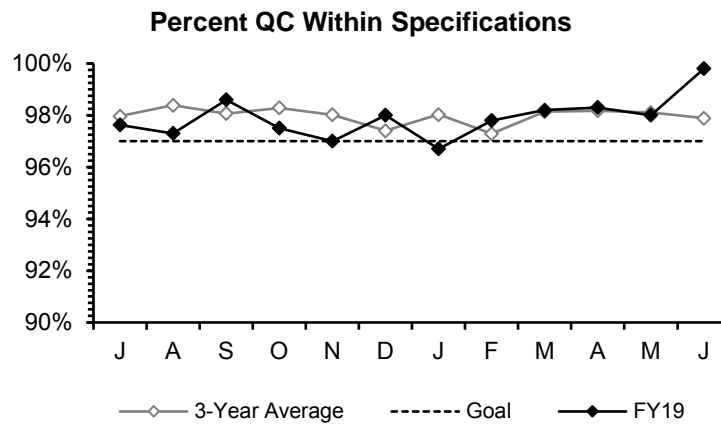
Laboratory Services Fourth Quarter - FY19



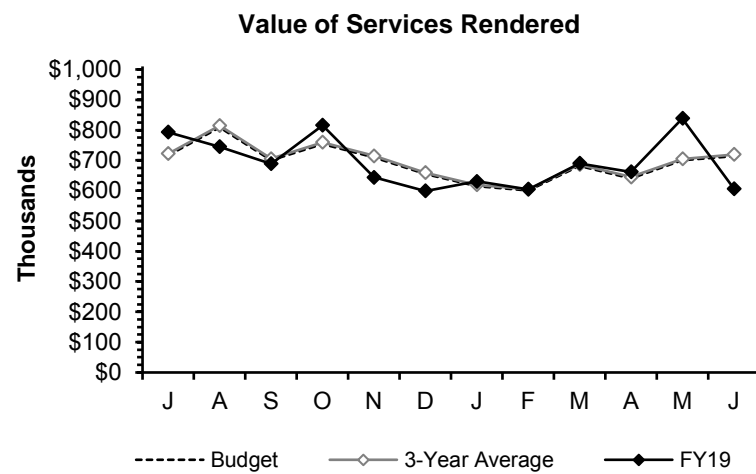
The Percent On-Time measurement was slightly below the 95% goal due to training of new staff.



Turnaround Time was faster than the 9-day goal.



Percent of QC tests meeting specifications exceeded the 97% in-house goal.



Value of Services Rendered exceeded annual budget projection.

Highlights:

School Lead: Several communities have started to do three year follow up from 2016 sampling of their schools. We received 1098 repeat samples from schools during the fourth quarter.

Mobile Lab: Participated in an ESU site visit to Nash Hill tank.

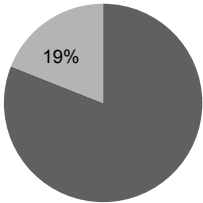
HOM: Received and processed three unanticipated *Alexandrium* (red tide) surveys during June.

CONSTRUCTION PROGRAMS

Projects In Construction

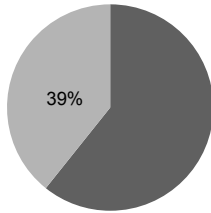
4th Quarter – FY19

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

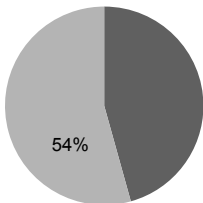
Southern Extra High Pipeline Section 111

Project Summary: This project consists of 6,800 linear feet of 36-inch water main in Dedham and Westwood and includes pipe jackings at the Dedham Corporate MBTA Station and at the MassDOT Route 95 East Street Rotary.

Notice to Proceed: 10-Aug-2018 **Contract Completion:** 7-Nov-2020

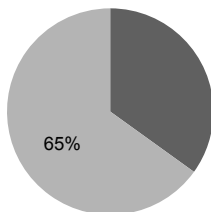
Status and Issues: As of June Crew 1 installed 468 ft. of 36" DICL pipe and Crew 2 installed 614 ft. of 36" DICL pipe for water mainline. Subcontractor GVC Construction installed 4 ft. of 36" DICL pipe for water mainline and installed the 36" gate valve vault, gate valve, and piping.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

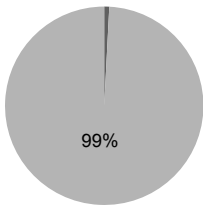
Chelsea Creek Headworks Upgrade

Project Summary: This project involves a major upgrade to the entire facility including: automation of screening collection & solids conveyance, replacement of the odor control, HVAC and electrical systems.

Notice to Proceed: 22-Nov-2016 **Contract Completion:** 21-Nov-2020

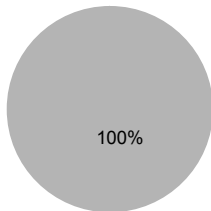
Status and Issues: As of June, the Contractor began cutting and chipping concrete for install of Ch. 2 stop log guides, for Screen 2 opening, to accommodate new inclined screw troughs. Demolished the existing Ch. 2 floor grating, influent and effluent thimbles, influent shaft submarine door on the Mezzanine Level. Performed operation test on Ch. 1 sluice gates with portable electric operator with no issue.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

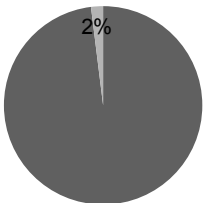
Wachusett Aqueduct Pumping Station

Project Summary: This project involves the construction of a 240 MGD pump station to supply water from the Wachusett Aqueduct to the Carroll Water Treatment Plant.

Notice to Proceed: 1-Mar-2016 **Contract Completion:** 14-Feb-2019

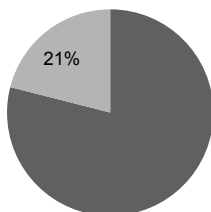
Status and Issues: All work on this project is complete. Punchlist work is on-going.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Commonwealth Ave Pump Station Improvements

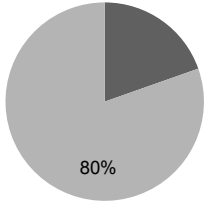
Project Summary: This project will provide a new connection to the station from two low service pipelines in Commonwealth Avenue and add low service pumps so that the City of Newton can be supplied in the event of a City Tunnel failure.

Notice to Proceed: 28-Feb-2019 **Contract Completion:** 30-Sep-2020

Status and Issues: As of June, the Contractor began demolition of HVAC in the East Building and select HVAC demolition in the West Building. They continue to provide submittals and RFI's.

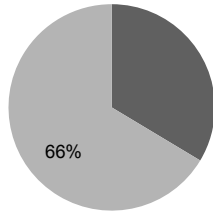
Projects In Construction 4th Quarter – FY19

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

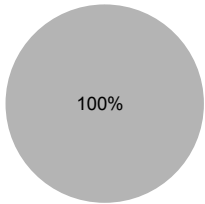
NIH Section 110 - Stoneham

Project Summary: This project consists of the replacement of 14,000 linear feet of 48-inch diameter transmission main in the Town of Stoneham.

Notice to Proceed: 5-Sep-2017 *Contract Completion:* 1-Jun-2020

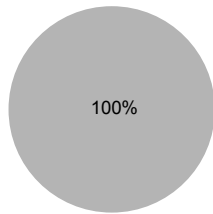
Status and Issues: As of June, the Contractor installed 1357-LF of 48" DIP water main along Pond Street, South Street, and Main Street. They removed 1215-CY of ledge along Pond Street and Main Street and completed the roadway restoration along Cottage Street.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

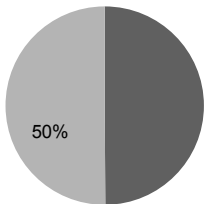
DITP Valves and Piping Replacements

Project Summary: This project involves the replacement of the twenty 60" butterfly valves and ten 60" flow meters in the NMPS; three 48", twelve 36" plug/check valves, six 30" flow meters and six 30-36" gate valves in the WTF.

Notice to Proceed: 23-Jun-2014 *Contract Completion:* 22-Sep-2017

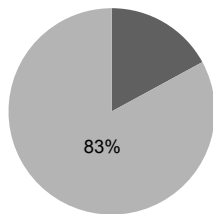
Status and Issues: The Contractor has demobilized and has completed all punchlist items. The final paperwork is being processed.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

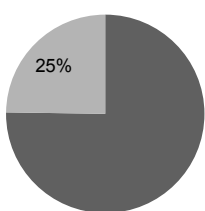
Winthrop Terminal VFD and Motor

Project Summary: This project involves the replacement of 6, 600-HP motors, VFDs and associated electrical components in the Winthrop Terminal Facility.

Notice to Proceed: 16-Jun-2016 *Contract Completion:* 12-Mar-2020

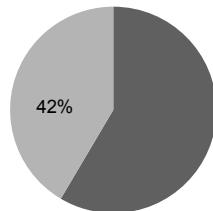
Status and Issues: VFD/Motor No. 2 commissioning testing completed and VFD No 5 installation started June 10th.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Gravity Thickener Rehabilitation

Project Summary: This project involves the upgrade of all six gravity thickeners, including the complete replacement of each tank's sludge and scum thickening equipment and 5 of the 6 FRP dome covers.

Notice to Proceed: 11-May-2018 *Contract Completion:* 4-Feb-2021

Status and Issues: As of June, the two week Functional Testing of GT-1 began on June 3rd. Functional testing found scum trough installed at wrong elevation. Contractor corrected issue and GT-1 placed back in service on June 21st. GT-2 equipment was delivered and the Contractor started demolishing GT-2

CSO CONTROL PROGRAM

4th Quarter – FY19

All 35 projects in the Long-Term CSO Control Plan were complete as of December 2015 in compliance with Schedule Seven. Of the \$910.1 million budget in the FY19 CIP for the CSO Control Program, approximately \$6.5 million remain to be spent. On April 17, 2019, the MWRA Board of Directors authorized Amendment 1 to CSO Contract 7572 in the amount of \$931,490 (described below), increasing the remaining amount to be spent on CSO control to approximately \$7.4 million.

Project/Item	Status as of June 30, 2019
<p>BWSC Dorchester Interceptor Inflow Removal</p>	<p>MWRA's CIP and the MOU/FAA with BWSC included \$5.4 million for additional inflow removal from the BWSC Dorchester Interceptor system in the South Dorchester Bay Sewer Separation area, of which \$1.7 million was transferred to the BWSC MOU/FAA CSO account and \$1.6 million of that was withdrawn by BWSC to fund related design and construction work. On May 17, 2017, MWRA's Board of Directors authorized removing the remaining \$3.8 million from the BWSC MOU/FAA (which ended on June 30, 2017) and including this funding amount in a separate, 4-year financial assistance agreement with BWSC effective July 1, 2017. The new agreement limits MWRA financial assistance to reimbursement of the eligible costs of BWSC construction work reviewed and approved by MWRA, up to \$3.8 million.</p> <p>BWSC recently completed sewer system evaluations and is preparing a construction contract for inflow removal that it plans to submit to MWRA for eligibility approval this fall.</p>
<p>City of Cambridge Memorandum of Understanding and Financial Assistance Agreement</p>	<p>The City of Cambridge attained substantial completion of its last project, CAM004 Sewer Separation, in December 2015 in compliance with Schedule Seven, and attained substantial completion of related surface restoration work by the end of 2017. MWRA made a final transfer of funds to the Cambridge CSO account in December 2017, in the amount of \$1,254,551, to cover eligible costs through June 30, 2018, when the 22 year-old, \$100.2 million MOU/FAA ended.</p> <p>Cambridge continues to support ongoing MWRA review of the construction contracts Cambridge managed under the CSO MOU and Financial Assistance Agreement. Staff expect to complete the review and issue a final eligibility certification <u>by September 30, 2019</u>.</p>
<p>MWRA CSO Performance Assessment – Contract 7572</p>	<p>MWRA issued the Notice to Proceed with the contract for CSO Post-Construction Monitoring and Performance Assessment to AECOM Technical Services, Inc., in November 2017. The contract includes CSO inspections, overflow metering, hydraulic modeling, system performance assessments and water quality compliance assessments, culminating in the submission of a report verifying attainment of court-ordered levels of CSO control to EPA and DEP in December 2020, in compliance with the last milestone in Schedule Seven.</p> <p>MWRA issued progress reports on the performance assessment on November 30, 2018 and May 3, 2019, and plans to issue a third progress report in October 2019. The issued progress reports presented the analyses of rainfall and CSO meter data collected in the periods April 15 - June 30, 2018 and July 1 – December 31, 2018, respectively. The third progress report will cover the data collection period of January 1 – June 30, 2019. Upgrade and improved calibration of MWRA's hydraulic model is underway and will be complete by August 31, 2019, allowing a comparison of model predicted and field measured CSO discharges, which will be presented in the October 2019 semiannual progress report. Model recalibration and verification will bring the meter results and model predictions closer together to gain assurance of the accuracy of the model in predicting CSO discharges and verifying attainment of the Long Term Control Plan's typical year levels of CSO control. AECOM also continues to conduct investigations at several outfalls where metered CSO discharges differ from historical model predictions.</p> <p>On April 17, 2019, the MWRA Board of Directors approved Amendment 1 to Contract 7572 in the amount of \$931,470. The amendment adds receiving water quality modeling of the Lower Charles River/Charles Basin and the Alewife Brook/Upper Mystic River in lieu of water quality data statistical analyses; extends temporary CSO metering to June 2020 at 36 CSO regulators; and provides for the eventual transfer of the temporary meters at regulators tributary to MWRA CSO outfalls for MWRA's long-term use in complying with expected CSO public notification requirements.</p> <p>MWRA continue to collect water quality data in CSO affected waters, with emphasis in the Charles River and Alewife Brook/Upper Mystic River, in part to support AECOM's receiving water modeling.</p>

CIP Expenditures

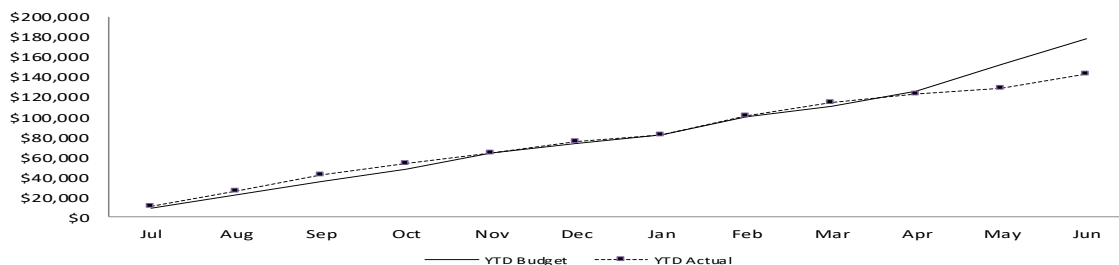
4th Quarter – FY19

FY19 Capital Improvement Program Expenditure Variances through June by Program (\$ in thousands)				
Program	FY19 Budget Through June	FY19 Actual Through June	Variance Amount	Variance Percent
Wastewater	93,803	74,850	(18,953)	-20%
Waterworks	77,085	65,647	(11,438)	-15%
Business and Operations Support	7,968	2,408	(5,560)	-70%
Total	\$178,856	\$142,905	(\$35,951)	-20%

Project underspending within Wastewater was due to delays in Channel 1 work, odor control equipment delivery, and redesign of the lower roofs for the Chelsea Creek Headworks Upgrade Construction, delay in completion of design documents for Nut Island Odor Control & HVAC Construction, updated schedules for Deer Island Clarifier Rehab Phase 2 and Dorchester Interceptor Sewer Construction contracts, schedule change and re-scoping of project for DI HVAC Equipment Replacement, delay in city of Somerville design and construction awards for the Somerville Marginal In-System Storage, delay in the notice to proceed for the Residuals Electrical and Mechanical contracts due to a combined scope of services, and timing of initial work for the Clinton Roofing Rehabilitation. This was partially offset by greater than anticipated community requests for grants and loans, and contractor progress on Deer Island Gravity Thickener Rehabilitation. Project underspending in Waterworks was due to delay in notice-to-proceed and issue with MBTA crossing for Southern Extra High Section 111 Construction 3, contract awarded less than budget and schedule change for Painting DI Water Tank, awarded less than budget and behind schedule due to additional structural repairs and antenna relocation for Bellevue 2 and Turkey Hill Painting/Improvements contract, schedule delay for the Maintenance Building/Garage Washbay/Storage Building contract, termination of Peabody Pipeline Design/ESDC and cancelled Construction, and delay in award for Chestnut Hill Emergency Pumping Station Design/CA. This was partially offset by greater than anticipated requests for community loans, progress for the Southern Extra High Section 111 Construction 2, Section 56 Pipe Demolition, Northern Intermediate High Section 89 & 29 Construction Phase 2, and timing of Watershed Land purchases.

Budget vs. Actual CIP Expenditures (\$ in thousands)

Total FY19 CIP Budget of \$178,856



Construction Fund Management

All payments to support the capital program are made from the Construction Fund. Sources of fund in-flows include bond proceeds, commercial paper, SRF reimbursements, loan repayments by municipalities, and current revenue. Accurate estimates of cash withdrawals and grant payments (both of which are derived from CIP spending projections) facilitate planning for future borrowings and maintaining an appropriate construction fund balance.

Cash Balance as of 6/30/2019	\$188.8 million
Unused capacity under the debt cap:	\$1.38 billion
Estimated date for exhausting construction fund without new borrowing:	MAY-20
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding:	\$128 million
Commercial paper capacity / Revolving Loan	\$350 million
Budgeted FY19 Cash Flow Expectancy*:	\$188 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

4th Quarter – FY19

Source Water – Microbial Results

Total coliform bacteria are monitored in both source and treated water to provide an indication of overall bacteriological activity. Most coliforms are harmless. However, fecal coliform, a subclass of the coliform group, are identified by their growth at temperatures comparable to those in the intestinal tract of mammals. They act as indicators of possible fecal contamination. The Surface Water Treatment Rule for unfiltered water supplies allows for no more than 10% of source water samples prior to disinfection over any six-month period to have more than 20 fecal coliforms per 100mL.

Sample Site: Quabbin Reservoir

Quabbin Reservoir water is sampled at the William A. Brutsch Water Treatment Facility raw water tap before being treated and entering the CVA system.

All samples collected during the 4th Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples have exceeded a count of 20 cfu/100mL.**

Sample Site: Wachusett Reservoir

Wachusett Reservoir water is sampled at the CWTP raw water tap in Marlborough before being treated and entering the MetroWest/Metropolitan Boston systems.

In the wintertime when smaller water bodies near Wachusett Reservoir freeze up, many waterfowl will roost in the main body of the reservoir - which freezes later. This increased bird activity tends to increase fecal coliform counts. DCR has an active bird harassment program to move the birds away from the intake area.

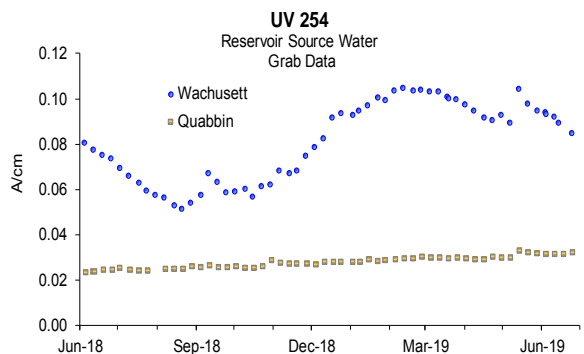
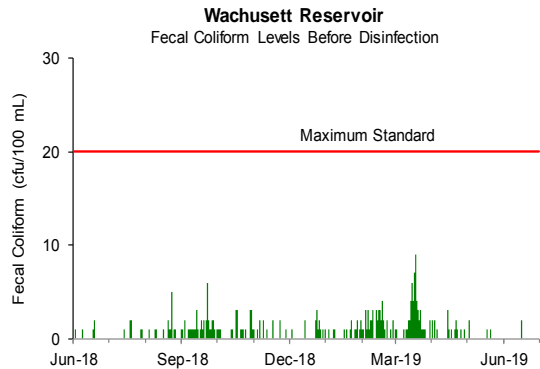
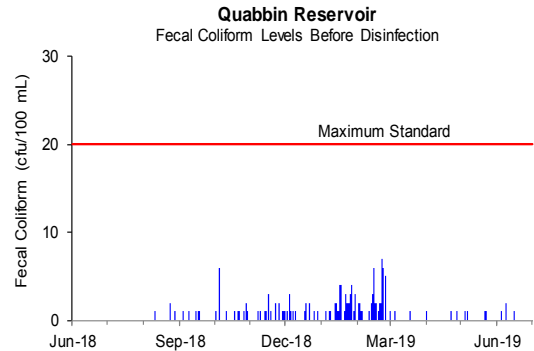
All samples collected during the 4th Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

Source Water – UV Absorbance

UV Absorbance at 254nm wavelength (UV-254), is a measure of the amount and reactivity of natural organic material in source water. Higher UV-254 levels cause increased ozone and chlorine demand resulting in the need for higher ozone and chlorine doses, and can increase the level of disinfection by-products. UV-254 is impacted by tributary flows, water age, sunlight and other factors.

Quabbin Reservoir UV-254 levels are currently around 0.032 A/cm.

Wachusett Reservoir UV-254 levels are currently around 0.082 A/cm.

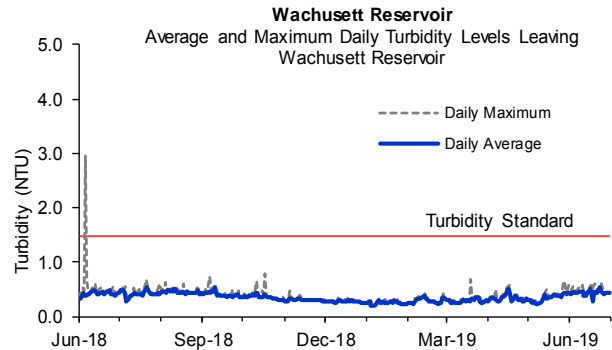
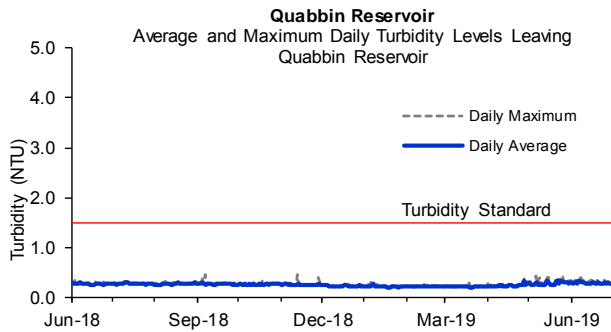


Source Water – Turbidity 4th Quarter – FY19

Turbidity is a measure of suspended and colloidal particles including clay, silt, organic and inorganic matter, algae and microorganisms. The effects of turbidity depend on the nature of the matter that causes the turbidity. High levels of particulate matter may have a higher disinfectant demand or may protect bacteria from disinfection effects, thereby interfering with the disinfectant residual throughout the distribution system.

There are two standards for turbidity: all water must be below five NTU (Nephelometric Turbidity Units), and water only can be above one NTU if it does not interfere with effective disinfection.

Turbidity of Quabbin Reservoir water is monitored continuously at the Brutsch Water Treatment Facility (BWTF) before UV and chlorine disinfection. Turbidity of Wachusett Reservoir is monitored continuously at the Carroll Water Treatment Plant (CWTP) before ozonation and UV disinfection. Maximum turbidity results at Quabbin and Wachusett were within DEP standards for the quarter.

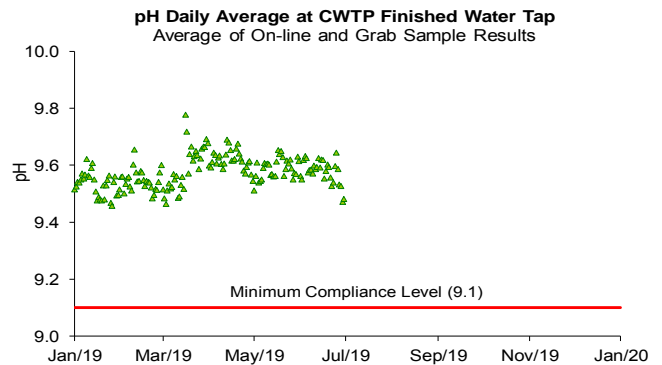
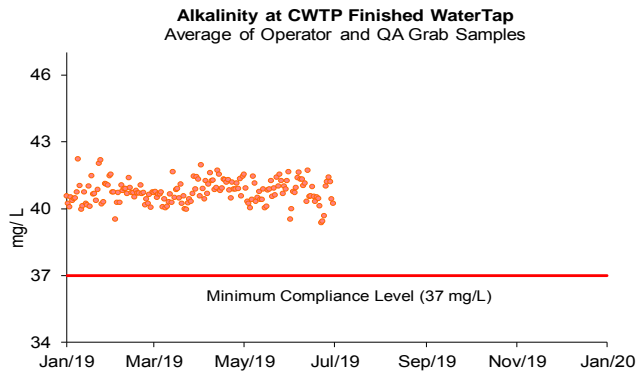


Treated Water – pH and Alkalinity Compliance

MWRA adjusts the alkalinity and pH of Wachusett water at CWTP to reduce its corrosivity, which minimizes the leaching of lead and copper from service lines and home plumbing systems into the water. MWRA tests finished water pH and alkalinity daily at the CWTP's Fin B sampling tap. MWRA's target for distribution system pH is 9.3; the target for alkalinity is 40 mg/l. Per DEP requirements, CWTP finished water samples have a minimum compliance level of 9.1 for pH and 37 mg/L for alkalinity. Samples from 27 distribution system locations have a minimum compliance level of 9.0 for pH and 37 mg/L for alkalinity. Results must not be below these levels for more than nine days in a six month period. Distribution system samples are collected in March, June, September, and December.

Each CVA community provides its own corrosion control treatment. See the CVA report: www.mwra.com/water/html/awqr.htm.

Distribution system samples were collected on June 12 and 13, 2019. Distribution system sample pH ranged from 9.3 to 9.6 and alkalinity ranged from 40 to 42 mg/L. No sample results were below DEP limits for this quarter.



Treated Water – Disinfection Effectiveness

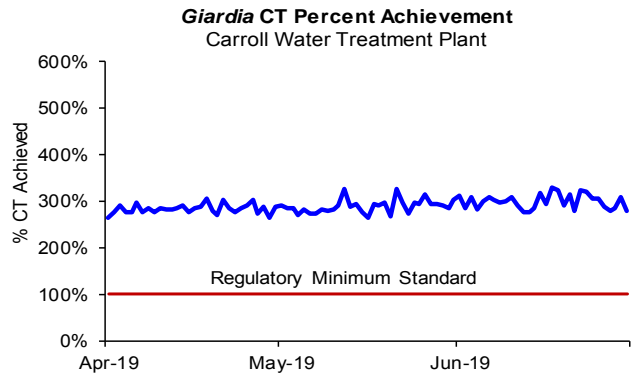
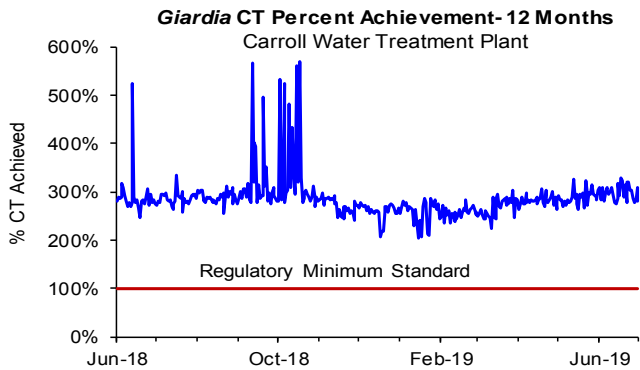
4th Quarter – FY19

At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA calculates inactivation rates hourly and reports *Giardia* inactivation at maximum flow and *Cryptosporidium* inactivation at minimum UV dose. MWRA must meet 100% of required CT and IT.

CT achievement for *Giardia* assures CT achievement for viruses, which have a lower CT requirement. For *Cryptosporidium*, there is also an "off-spec" requirement. Off-spec water is water that has not reached the full required UV dose or if the UV reactor is operated outside its validated ranges. No more than 5% off-spec water is allowed in a month.

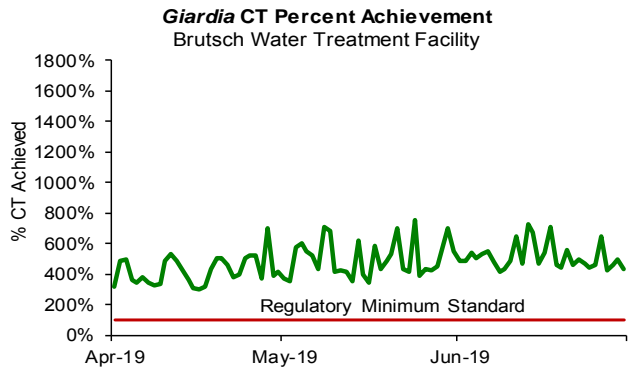
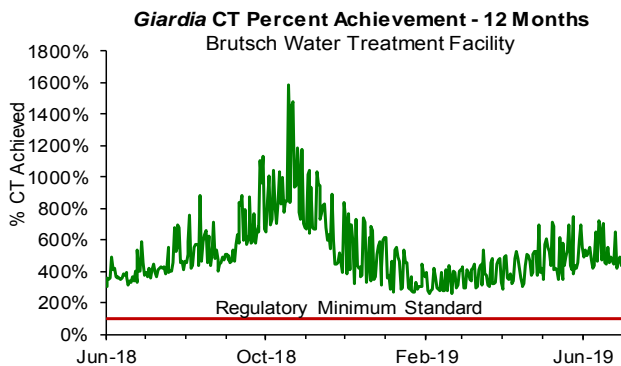
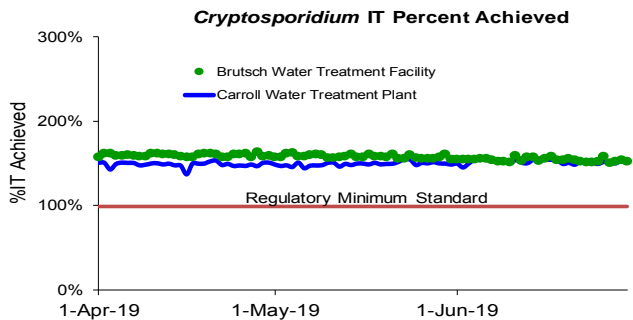
Wachusett Reservoir – MetroWest/Metro Boston Supply:

- Ozone dose at the CWTP varied between 2.8 to 3.7 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.
- The Wachusett Aqueduct Pump Station (WAPS) will improve redundancy in the MWRA water system. WAPS testing was initiated in June 2018 and continued through October 2018. Prior to and during WAPS testing, CWTP proactively increased the ozone dose and "CT achievement". This is visible in the top left graph.



Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal target of >0.75 mg/L (November 01 – May 31) and >1.0 mg/L (June 1– October 31) at Ludlow Monitoring Station.
- The chlorine dose at BWTF varied between 1.5 to 1.9 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system for the quarter.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.

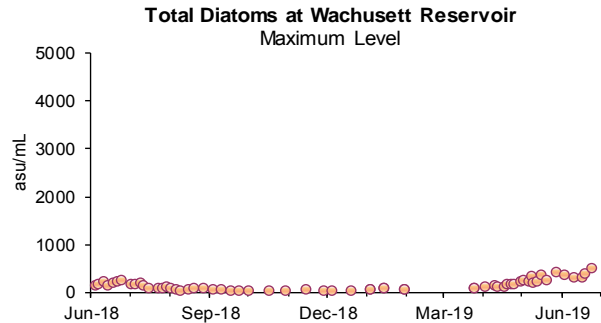
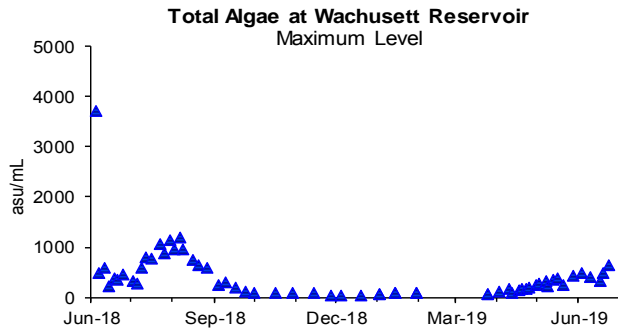


Source Water - Algae 4th Quarter – FY19

Algae levels in Wachusett Reservoir are monitored by DCR and MWRA. These results, along with taste and odor complaints, are used to make decisions on source water treatment for algae control.

Taste and odor complaints at the tap may be due to algae, which originate in source reservoirs, typically in trace amounts. Occasionally, a particular species grows rapidly, increasing its concentration in water. When *Synura*, *Anabaena*, or other nuisance algae bloom, MWRA may treat the reservoir with copper sulfate, an algaecide. During the winter and spring, diatom numbers may increase. While not a taste and odor concern, consumers that use filters may notice a more frequent need to change their filters.

In the 4th Quarter, no complaints which may be related to algae were reported from the local water departments.



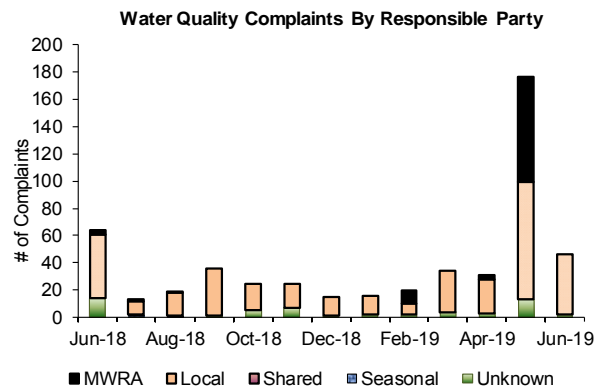
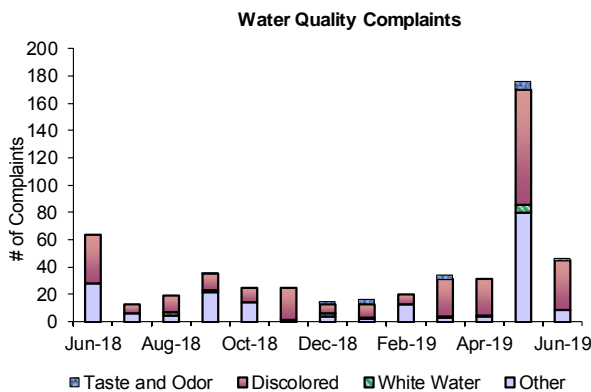
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

MWRA collects information on water quality complaints that typically fall into four categories: 1.) discoloration due to MWRA or local pipeline work; 2.) taste and odor due to algae blooms in reservoirs or chlorine in the water; 3.) white water caused by changes in pressure or temperature that traps air bubbles in the water; or 4.) "other" complaints including no water, clogged filters or other issues.

MWRA routinely contacts communities to classify and tabulate water complaints from customers. This count, reflecting only telephone calls to towns, probably captures only a fraction of the total number of customer complaints. Field Operations staff have improved data collection and reporting by keeping track of more kinds of complaints, tracking complaints to street addresses and circulating results internally on a daily basis.

Communities reported 253 complaints during the quarter compared to 187 complaints from 4th Quarter of FY18. Of these complaints, 146 were for "discolored water", 7 were for "taste and odor", 7 were for "white water", and 93 were for "other". Of these complaints, 155 were local community issues, 80 were MWRA related issues, and 18 were unknown in origin.

- On May16, Arlington reported seventy low pressure and no water complaints when MWRA staff were performing valve maintenance on a meter located at Palmer Street.
- On May 22, Marblehead reported twenty eight discolored water complaints when the local fire department was performing hydrant flushing in the area of Pilgrim Street.



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

4th Quarter – FY19

While all communities collect bacteria samples and chlorine residual data for the Total Coliform Rule (TCR), data from the 44 systems that use MWRA's Laboratory are reported below.

The MWRA TCR program has 141 sampling locations. These locations include sites along MWRA's transmission system, water storage tanks and pumping stations, as well as a subset of the community TCR locations.

Samples are tested for total coliform and Escherichia coli. *E.coli* is a specific coliform species whose presence likely indicates potential contamination of fecal origin.

If *E.coli* are detected in a drinking water sample, this is considered evidence of a potential public health concern. Public notification is required if repeat tests confirm the presence of *E.coli* or total coliform.

Total coliform provide a general indication of the sanitary condition of a water supply. If total coliform are detected in more than 5% of samples in a month (or if more than one sample is positive when less than 40 samples are collected), the water system is required to investigate the possible source/cause with a Level 1 or 2 Assessment, and fix any identified problems.

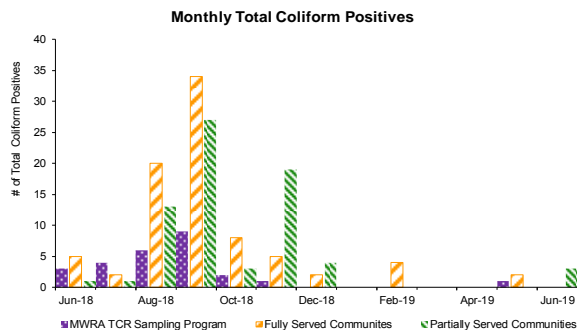
A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

Highlights

In the 4th Quarter, 5 of the 6,227 community samples (0.08% system-wide) submitted to MWRA labs for analysis tested positive for total coliform (Chelsea, Waltham - May; Bedford, Peabody, Woburn - June). One of the 1,961 Shared community/MWRA samples (0.05%) tested positive for total coliform. No samples tested positive for *E.coli* and repeat samples were absent of both total coliform and *E.coli*. Only 0.1% of the Fully Served community samples had chlorine residuals lower than 0.2 mg/L for the quarter. No community violated the TCR. Starting in May, Marlborough is considered fully-supplied by MWRA and MADEP.

NOTES:

- MWRA total coliform and chlorine residual results include data from community locations. In most cases these community results are indicative of MWRA water as it enters the community system; however, some are strongly influenced by local pipe conditions. Residuals in the MWRA system are typically between 1.0 and 2.8 mg/L.
- The number of samples collected depends on the population served and the number of repeat samples required.
- These communities are partially supplied, and may mix their chlorinated supply with MWRA chloraminated supply.
- Part of the Chicopee Valley Aqueduct System. Free chlorine system.



	Total Coliform			E.coli # Positive	Assessment Required
	# Samples (b)	# (%) Positive			
MWRA a	MWRA Locations	388	0 (0%)	0	
	Shared Community/MWRA sites	1573	1 (0.06%)	0	
	Total: MWRA	1961	1 (0.05%)	0	No
Fully Served	ARLINGTON	169	0 (0%)	0	
	BELMONT	104	0 (0%)	0	
	BOSTON	780	0 (0%)	0	
	BROOKLINE	224	0 (0%)	0	
	CHELSEA	172	1 (0.58%)	0	No
	DEER ISLAND	51	0 (0%)	0	
	EVERETT	169	0 (0%)	0	
	FRAMINGHAM	237	0 (0%)	0	
	LEXINGTON	117	0 (0%)	0	
	LYNNFIELD	18	0 (0%)	0	
	MALDEN	234	0 (0%)	0	
	MARBLEHEAD	72	0 (0%)	0	
	MARLBOROUGH	84	0 (0%)	0	
	MEDFORD	204	0 (0%)	0	
	MELROSE	117	0 (0%)	0	
	MILTON	101	0 (0%)	0	
	NAHANT	30	0 (0%)	0	
	NEWTON	276	0 (0%)	0	
	NORTHBOROUGH	48	0 (0%)	0	
	NORWOOD	99	0 (0%)	0	
	QUINCY	338	0 (0%)	0	
	READING	130	0 (0%)	0	
	REVERE	180	0 (0%)	0	
	SAUGUS	104	0 (0%)	0	
	SOMERVILLE	273	0 (0%)	0	
	SOUTHBOROUGH	30	0 (0%)	0	
	STONEHAM	91	0 (0%)	0	
	SWAMPSCOTT	54	0 (0%)	0	
	WALTHAM	219	1 (0.46%)	0	No
	WATERTOWN	130	0 (0%)	0	
	WESTON	45	0 (0%)	0	
	WINTHROP	72	0 (0%)	0	
		Total: Fully Served	4972	2 (0.04%)	0
Partially Served	BEDFORD	60	1 (1.67%)	0	No
	CANTON	89	0 (0%)	0	
	HANSCOM AFB	31	0 (0%)	0	
	MARLBOROUGH	42	0 (0%)	0	
	NEEDHAM	123	0 (0%)	0	
	PEABODY	212	1 (1.47%)	0	No
	WAKEFIELD	148	0 (0%)	0	
	WELLESLEY	114	0 (0%)	0	
	WILMINGTON	87	0 (0%)	0	
	WINCHESTER	91	0 (0%)	0	
CVA d	WOBURN	198	1 (0.51%)	0	No
	SOUTH HADLEY FD1	60	0 (0%)	0	
	Total: CVA & Partially Served	1255	3 (0.24%)	0	
	Total: Community Samples	6227	5 (0.08%)	0	

Chlorine Residuals in Fully Served Communities

	2018							2019					
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
% <0.1	0.0	0.3	0.7	0.5	0.7	0.7	0.2	0.3	0.2	0.1	0.0	0.0	0.0
% <0.2	0.4	0.5	1.0	1.5	1.9	1.6	1.0	0.3	0.2	0.1	0.1	0.1	0.1
% <0.5	0.7	1.5	3.4	4.6	5.8	3.8	2.3	1.1	0.6	0.4	0.3	0.3	0.9
% <1.0	1.6	3.2	8.9	11.9	11.2	8.3	5.2	2.8	1.8	1.7	1.4	1.9	3.2
% >1.0	98.4	96.8	91.1	88.2	88.8	91.7	94.8	97.2	98.2	98.4	98.7	98.1	96.8

Treated Water Quality: Disinfection By-Product (DBP) Levels in Communities

4th Quarter – FY19

Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s) are by-products of disinfection treatment with chlorine. TTHMs and HAA5s are of concern due to their potential adverse health effects at high levels. EPA’s locational running annual average (LRAA) standard is 80 µg/L for TTHMs and 60 µg/L for HAA5s.

The locational running annual average at each individual sampling location must be below the standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

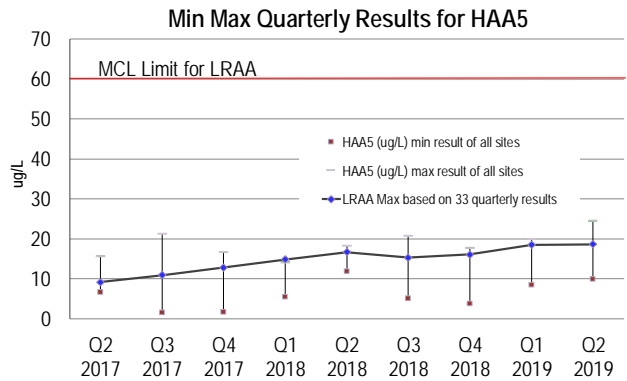
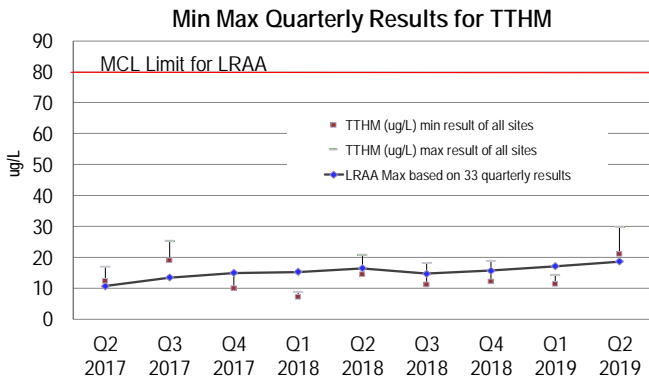
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1).

Bromate is tested monthly per DEP requirements for water systems that treat with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA’s RAA MCL standard for bromate is 10 µg/L.

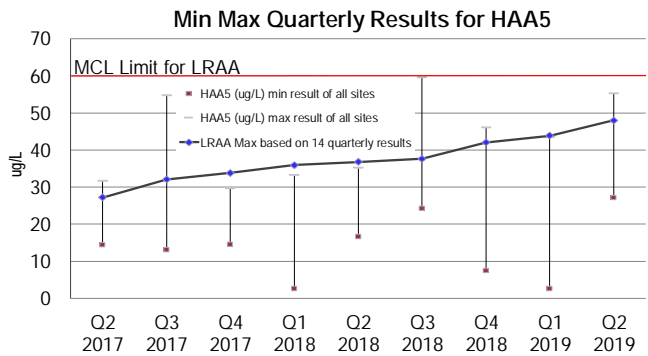
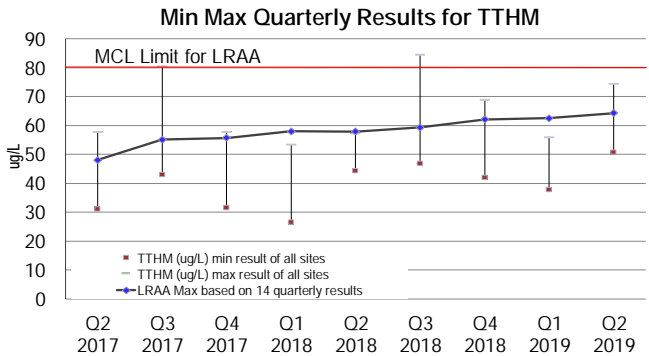
The LRAA for TTHMs and HAA5s for MWRA’s Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 18.6 µg/L; HAA5s = 18.6 µg/L. The current RAA for Bromate = 0.0 µg/L. CVA’s DBP levels continue to be below current standards.

A quarterly DBP location in Marlborough was added to MWRA’s Compliance Program in Q2, 2019.

MetroBoston Disinfection By-Products



CVA Disinfection By-Products (Combined Results)



Water Supply and Source Water Management

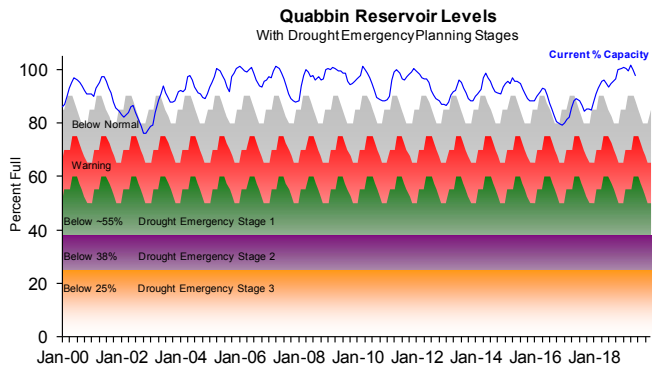
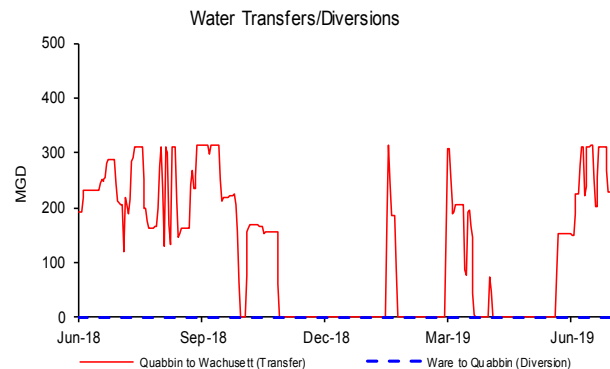
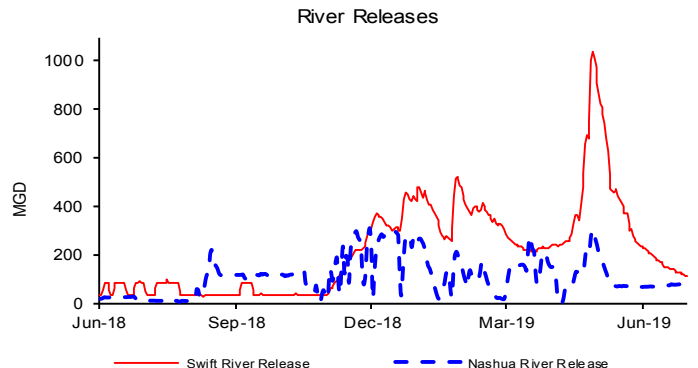
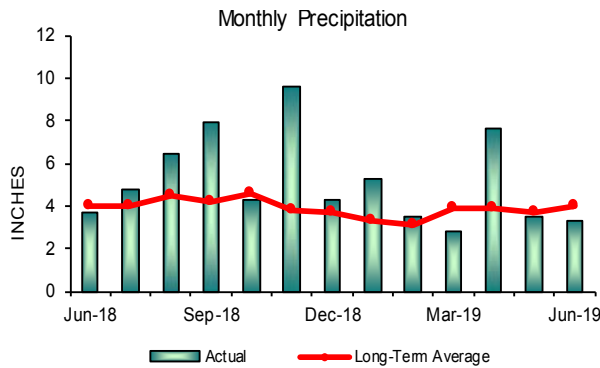
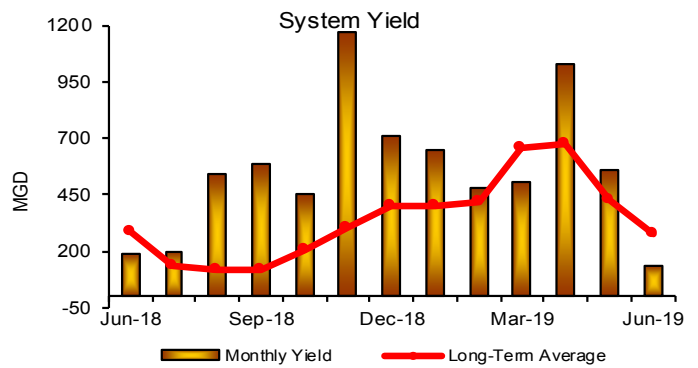
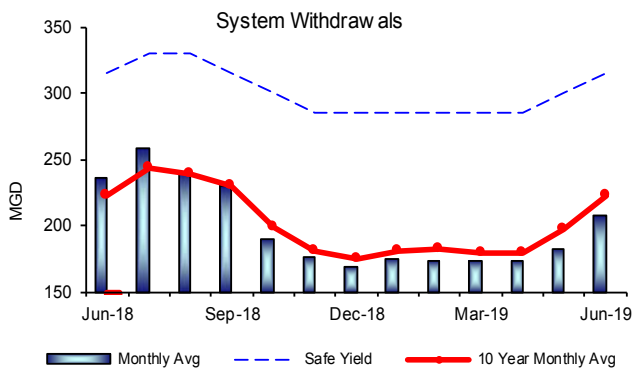
4th Quarter – FY19

Background

A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir was designed to effectively supply water to the service areas under a range of climatic conditions and has the ability to endure a range of fluctuations. Wachusett Reservoir serves as a terminal reservoir to meet the daily demands of the Greater Boston area. A key component to this reservoir's operation is the seasonal transfer of Quabbin Reservoir water to enhance water quality during high demand periods. On an annual basis, Quabbin Reservoir accounts for nearly 50% of the water supplied to Greater Boston. The water quality of both reservoirs (as well as the Ware River, which is also part of the System Safe Yield) depend upon implementation of DCR's DEP-approved Watershed Protection Plans. System Yield is defined as the water produced by its sources, and is reported as the net change in water available for water supply and operating requirements.

Outcome

The volume of the Quabbin Reservoir was in normal operating level at 97.6% as of June 30, 2019; a 2.0% decrease for the quarter, which represents a reduction of more than 8.2 billion gallons of storage and a decrease in elevation of 1.06' for the quarter. System withdrawal for the quarter was below the 10 year monthly average. Precipitation and Yield for the quarter were above their respective long term quarterly average.



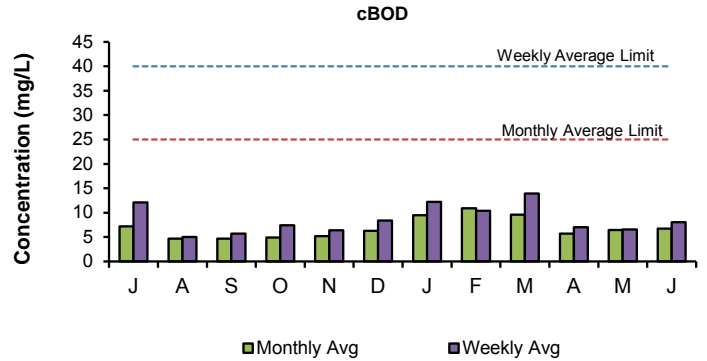
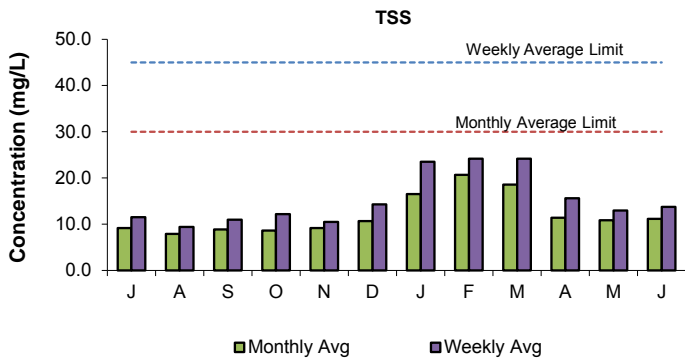
WASTEWATER QUALITY

NPDES Permit Compliance: Deer Island Treatment Plant 4th Quarter - FY19

NPDES Permit Limits

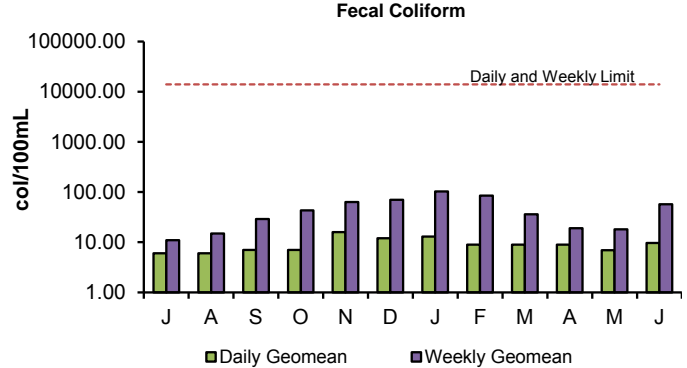
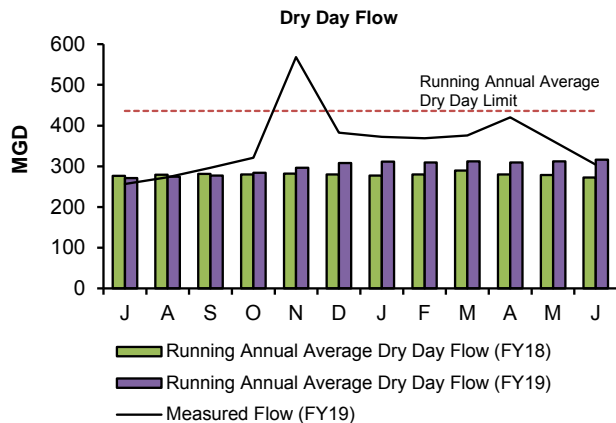
Effluent Characteristics	Units	Limits	April	May	June	4th Quarter Violations	FY19 YTD Violations	
Dry Day Flow (365 Day Average):	mgd	436	309.0	312.3	316.4	0	0	
cBOD:	Monthly Average	mg/L	25	5.7	6.4	6.7	0	0
	Weekly Average	mg/L	40	7.0	6.5	8.1	0	0
TSS:	Monthly Average	mg/L	30	11.4	10.9	11.2	0	0
	Weekly Average	mg/L	45	15.6	13.0	13.8	0	0
TCR:	Monthly Average	ug/L	456	0	0	0	0	0
	Daily Maximum	ug/L	631	0	0	0	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	9	7	0	0	0
	Weekly Geometric Mean	col/100mL	14000	19	18	57	0	0
	% of Samples >14000	%	10	0	0	0	0	0
	Consecutive Samples >14000	#	3	0	0	0	0	0
pH:	SU	6.0-9.0	6.4-6.9	6.5-6.9	6.4-6.9	0	0	
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	100	100	100	0	0
	Inland Silverside	%	≥1.5	100	100	25	0	0

There have been no permit violations in FY19 to date at the Deer Island Treatment Plant (DITP).



Total Suspended Solids (TSS) in the effluent is a measure of the amount of solids that remain suspended after treatment. All TSS measurements for the 4th Quarter were within permit limits.

Carbonaceous Biochemical Oxygen Demand (cBOD) is a measure of the amount of dissolved oxygen required for the decomposition of organic materials in the environment. All cBOD measurements for the 4th Quarter were within permit limits.



Running Annual Average Dry Day Flow is the average of all dry weather influent flows over the previous 365 days. The Dry Day Flow for the 4th Quarter was well below the permit limit of 436 MGD.

Fecal Coliform is an indicator for the possible presence of pathogens. The levels of these bacteria after disinfection show how effectively the plant is inactivating many forms of disease-causing microorganisms. In the 4th Quarter, all permit conditions for fecal coliform were met.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant 4th Quarter - FY19

NPDES Permit Limits

Effluent Characteristics		Units	Limits	April	May	June	4th Quarter Violations	FY19 YTD Violations
Flow:	12-month Rolling Average:	mgd	3.01	3.17	3.21	3.23	3	8
BOD:	Monthly Average:	mg/L	20	1.3	0.9	7.1	0	0
	Weekly Average:	mg/L	20	2.2	1.6	23.5	1	1
TSS:	Monthly Average:	mg/L	20	4.2	3.6	3.9	0	0
	Weekly Average:	mg/L	20	5.4	3.7	5.4	0	1*
pH:		SU	6.5-8.3	6.9-7.5	6.7-7.4	7.1-7.5	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	8.7	8.4	8.2	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	6.0	5.0	6.0	0	0
	Daily Geometric Mean:	cfu/100mL	409	14.0	14.0	31.0	0	1
TCR:	Monthly Average:	ug/L	17.6	4.7	0.1	0.0	0	0
	Daily Maximum:	ug/L	30.4	57.1	2.5	0.0	2	2
Copper:	Monthly Average:	ug/L	11.6	5.8	3.5	4.8	0	0
	Daily Maximum:	ug/L	14.0	5.8	3.5	5.0	0	0
Total Ammonia Nitrogen: June 1st - October 31st	Monthly Average:	mg/L	2.0	0.11	0.10	0.04	0	0
	Daily Maximum:	mg/L	3.0	0.15	0.14	0.14	0	0
Total Phosphorus: April 1st - October 31st	Monthly Average:	mg/L	0.15	0.05	0.05	0.06	0	0
	Daily Maximum:	mg/L	RPT	0.08	0.08	0.09	0	0
Acute Toxicity*:	Daily Minimum:	%	≥100	N/A	N/A	>100	0	0
Chronic Toxicity*:	Daily Minimum:	%	≥62.5	N/A	N/A	25	1	1

There were fourteen permit violations in FY19 at the Clinton Treatment Plant.

1st Quarter: There were no permit violations in the first quarter.

2nd Quarter: There were three permit violations in the second quarter.

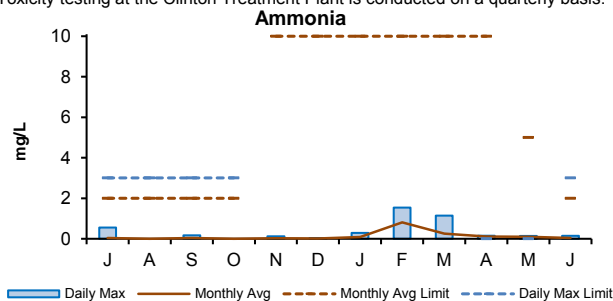
3rd Quarter: There were four permit violations in the third quarter.

4th Quarter: There were seven permit violations in the fourth quarter.

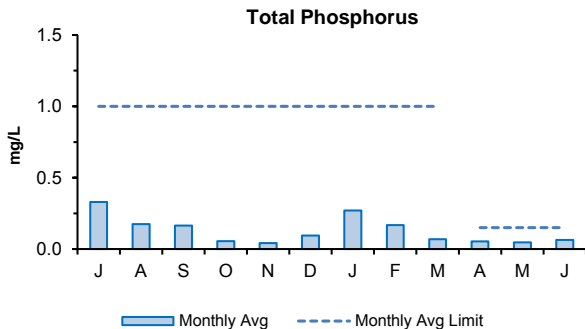
- The 12-month rolling average flow exceeded the limit of 3.01 MGD due to excessive rains in the region in late 2018.
- The BOD weekly average exceeded the limit of 20 mg/L the week of June 9th, 2019, as a result of a high-BOD slug of industrial wastewater. This event was reported as a plant upset and the identified industrial source is not expected to cause upsets in the future.
- There were two exceedances of the maximum daily total chlorine residual limit on April 28-29 during high flows. Most samples taken on these dates did not detect residual chlorine, but the daily maximum was exceeded. While the sodium bisulfite pump was operating at maximum speed, it was dosing at a rate that should have been neutralizing more chlorine than was being added.
- The chronic toxicity in June was measured at 25%, below the permit limit of 62.5%.

* This violation is of the TSS weekly average loading in lbs/day, not TSS concentration in mg/L.

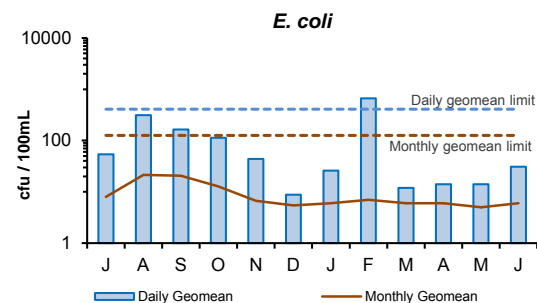
+ Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



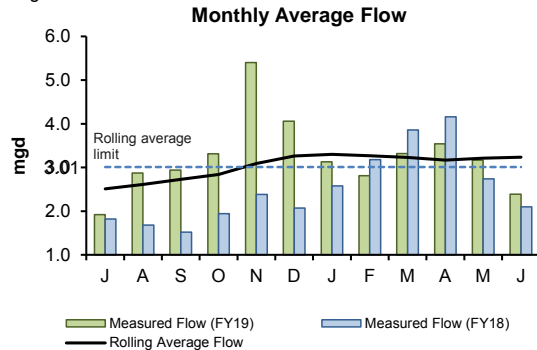
The 4th Quarter's monthly average and daily maximum concentrations of ammonia were below the permit limits. The monthly average and daily maximum limits for the 4th Quarter are variable, ranging from 10 and 35.2 mg/L to 2 and 3 mg/L respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.



The 4th Quarter's monthly average concentrations for total phosphorus were below permit limits. The new permit limit of 0.15 mg/L from April through October went into effect April 1st, 2019. The new permit limit of 1.0 mg/L from November through March goes into effect November 1st, 2019.



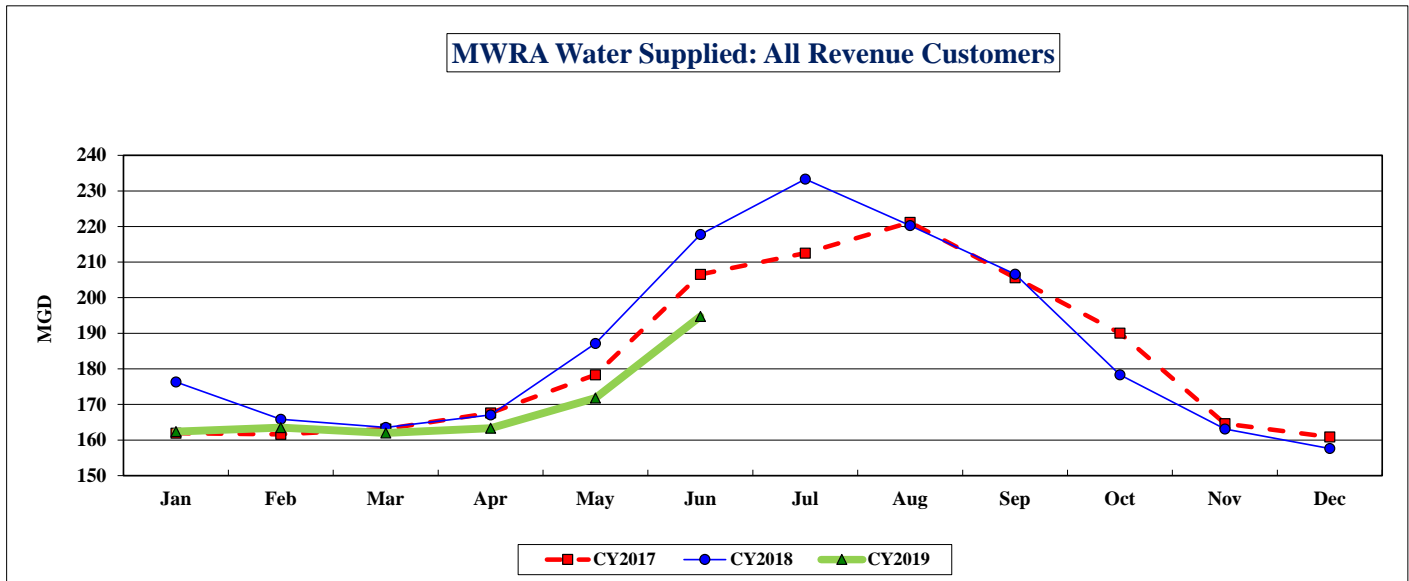
E. coli is an indicator for the possible presence of pathogens. The *E. coli* daily geomean on February 15th was 667 cfu/100mL, exceeding the permit limit of 409 cfu/100mL. A return activated sludge valve failure on February 13th in Final Clarifier 2 ultimately led to this exceedance. *E. coli* levels were very low during February outside of this incident, reflected by the monthly geometric mean of 7 cfu/100mL.



The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The 12-month rolling average flows during the 4th quarter exceeded the limit of 3.01 due to excessive rains in the region during November and December 2018.

COMMUNITY FLOWS AND PROGRAMS

Total Water Use 4th Quarter - FY19



MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2017	161.941	161.609	163.129	167.613	178.331	206.541	212.533	221.175	205.579	190.053	164.610	160.853	182.969	182.969
CY2018	176.294	165.841	163.539	167.056	187.145	217.776	233.321	220.268	206.586	178.340	163.125	157.612	179.695	186.553
CY2019	162.367	163.492	161.984	163.350	171.782	194.749	0.000	0.000	0.000	0.000	0.000	0.000	169.618	169.618

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Total	Annual Total
CY2017	5,020.179	4,525.063	5,056.997	5,028.390	5,528.255	6,196.217	6,588.510	6,856.435	6,167.355	5,891.640	4,938.301	4,986.434	66,783.777	66,783.777
CY2018	5,465.125	4,643.548	5,069.719	5,011.695	5,801.508	6,533.267	7,232.949	6,828.310	6,197.590	5,528.550	4,893.739	4,885.979	32,524.861	68,091.978
CY2019	5,033.382	4,577.768	5,021.509	4,900.488	5,325.247	5,842.463	0.000	0.000	0.000	0.000	0.000	0.000	30,700.859	169.618

The June 2019 Community Water Use Report was recently distributed to communities served by the MWRA waterworks systems. Each community's annual water use relative to the system as a whole is the primary factor in allocating the annual water rate revenue requirement to MWRA water communities. Calendar year 2019 water use will be used to allocate the FY21 water utility rate revenue requirement.

June 2019 water supplied of 194.7 mgd (for revenue generating users) is down 23.0 mgd or 10.6% compared to June 2018. System-wide year to date consumption for CY19 is lower than CY18 with 169.6 mgd being supplied to MWRA customers through June. This is 10.1 mgd lower than CY18, and is a decrease of 5.6%.

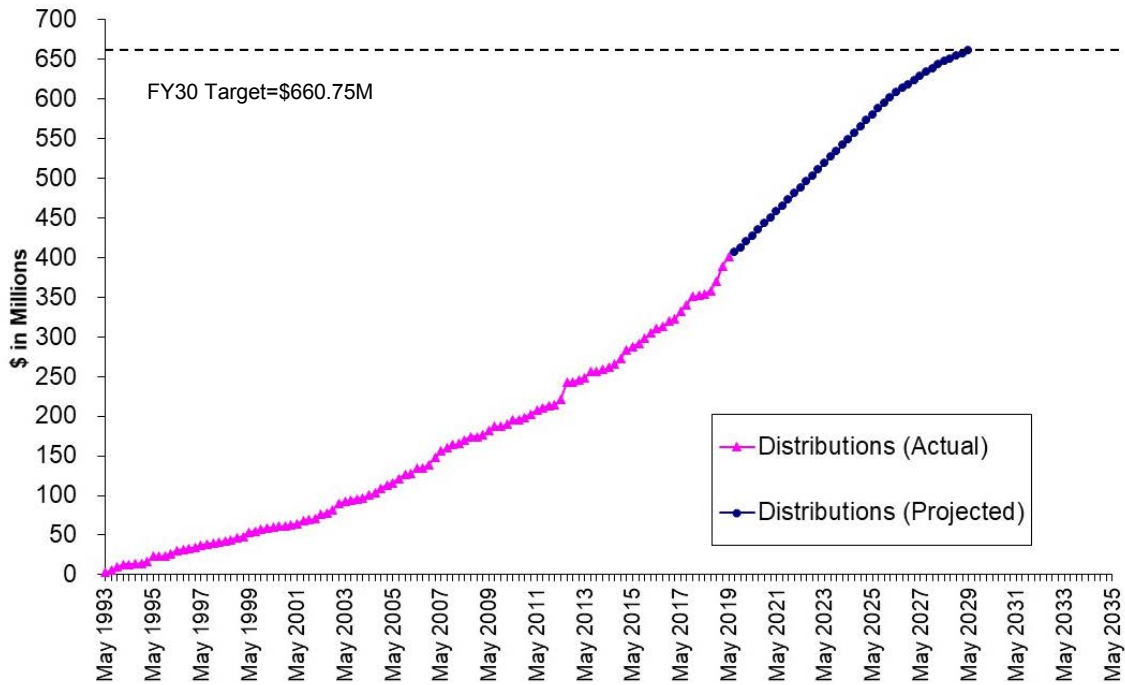
Community Support Programs

4th Quarter – FY19

Infiltration/Inflow Local Financial Assistance Program

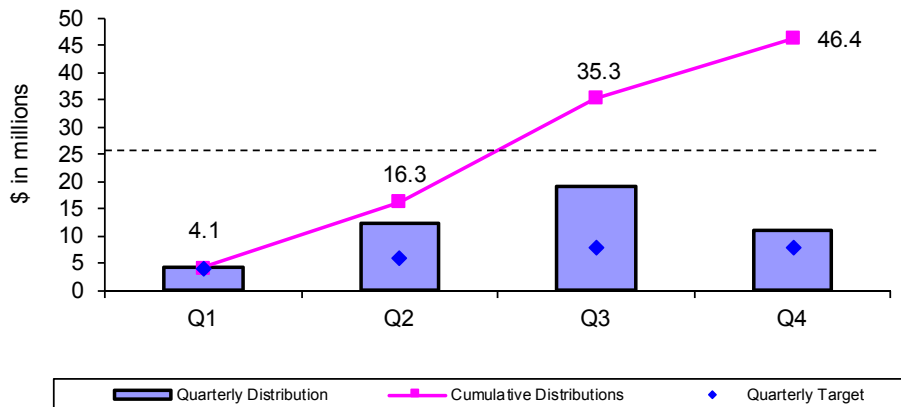
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides \$760.75 million in grants and interest-free loans (average of about \$20 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Eligible project costs include: sewer rehabilitation construction, pipeline replacement, removal of public and private inflow sources, I/I reduction planning, engineering design, engineering services during construction, etc. I/I Local Financial Assistance Program funds are allocated to member sewer communities based on their percent share of MWRA's wholesale sewer charge. Phase 1-8 funds (total \$300.75 million) were distributed as 45% grants and 55% loans with interest-free loans repaid to MWRA over a five-year period. Phase 9 through 12 funds (total \$360 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period. An additional future Phase 13 provides an additional \$100 million in loan-only funds (not yet included in the graph of distributions below).

I/I Local Financial Assistance Program Distribution FY93-FY30



During the 4th Quarter of FY19, \$11.1 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Arlington, Bedford, Burlington, Framingham, Reading, Somerville, Stoughton, Waltham and Wilmington. Total grant/loan distribution for FY19 is \$46.4 million. From FY93 through the 4th Quarter of FY19, all 43 member sewer communities have participated in the program and \$401 million has been distributed to fund 574 local I/I reduction and sewer system rehabilitation projects. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY19 Quarterly Distributions of Sewer Grant/Loans



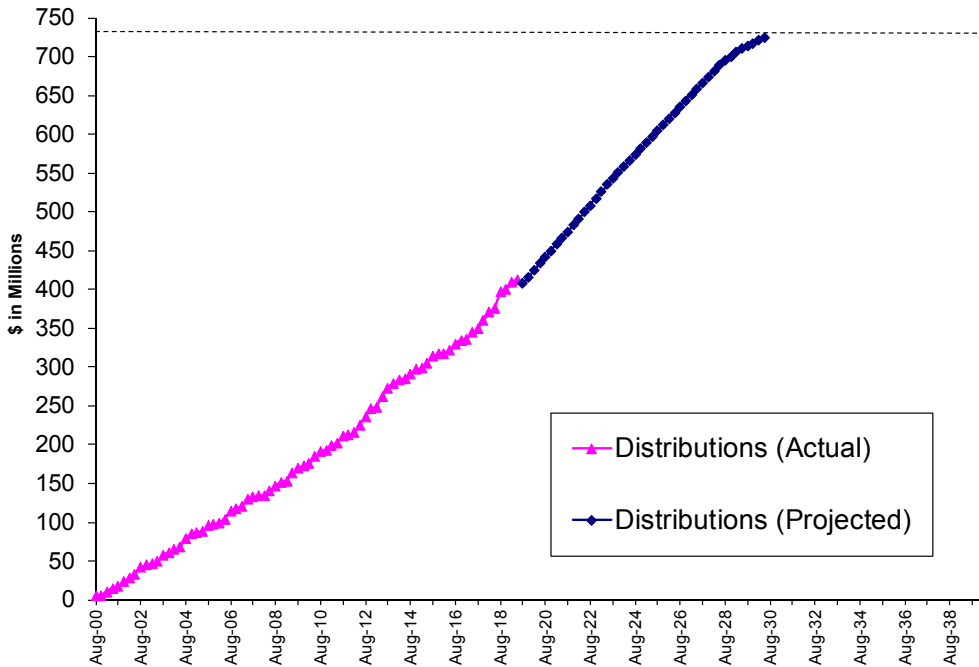
Community Support Programs

4th Quarter – FY19

Local Water System Assistance Program

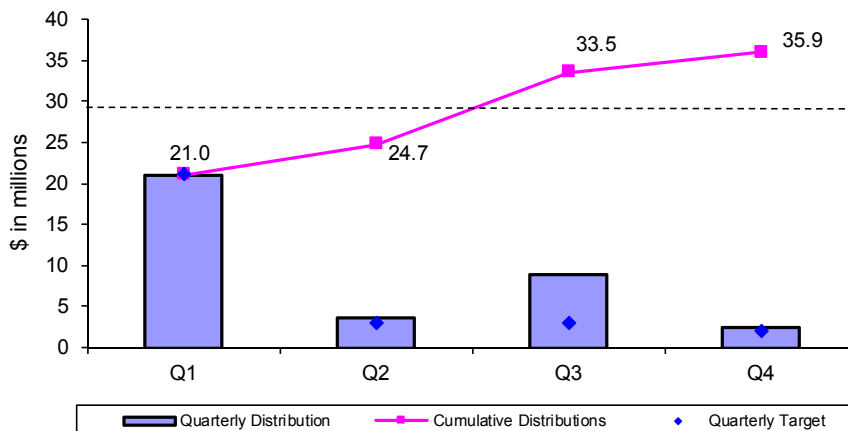
MWRA's Local Water System Assistance Programs (LWSAP) provides \$724 million in interest-free loans (an average of about \$24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have been 3 phases: Phase 1 at \$222 Million, Phase 2 at \$210 Million, and Phase 3 at \$292 Million. Eligible project costs include: water main cleaning/lining, replacement of unlined water mains, lead service replacements, valve, hydrant, water meter, tank work, engineering design, engineering services during construction, etc. MWRA partially-supplied communities receive pro-rated funding allocations based on their percentage use of MWRA water. Interest-free loans are repaid to MWRA over a ten-year period beginning one year after distribution of the funds. The Phase 1 water loan program concluded in FY13 with \$222 million in loan distributions. The Phase 2 - LWSAP continues distributions through FY23. The Phase 3 Water Loan Program is authorized for distributions FY18 through FY30.

Local Water System Assistance Program Distribution FY01-FY30



During the 4th Quarter of FY19, \$2.4 million in interest-free loans was distributed to fund local water projects in Chelsea and Quincy. Total loan distribution for FY19 is \$35.9 million. From FY01 through the 4th Quarter of FY19, \$411 million has been distributed to fund 448 local water system rehabilitation projects in 42 MWRA member water communities. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY19 Quarterly Distributions of Water Loans



Community Support Programs

4th Quarter – FY19

Lead Service Line Replacement Loan Program

By its vote on March 16, 2016, the Board approved an enhancement to the Local Water System Assistance Program to provide up to \$100 million in 10-year zero-interest loans to communities solely for efforts to fully replace lead service lines. The Lead Service Line Replacement Loan Program is also referenced as the Lead Loan Program or LLP. Each community can develop its own program, tailored to their local circumstances. MWRA's goal in providing financial assistance to member communities is to improve local water systems so that the high quality water MWRA delivers can make it all the way to the consumer's tap. The presence of a lead service line connecting a home to the main in the street can lead to elevated lead levels in tap water, especially if that water sits stagnant for an extended period. MWRA's stable water quality and effective corrosion control treatment reduce the risk that a lead service line will cause elevated lead levels, and measured lead levels in high risk homes have decreased by 90 percent since corrosion control was brought on-line in 1996. However, the risk of elevated levels remains as long as lead service lines are in use.

FY17 was the first year of the Lead Service Line Replacement Loan Program. During FY17, MWRA made three Lead Loan Program distributions as noted in the Table below.

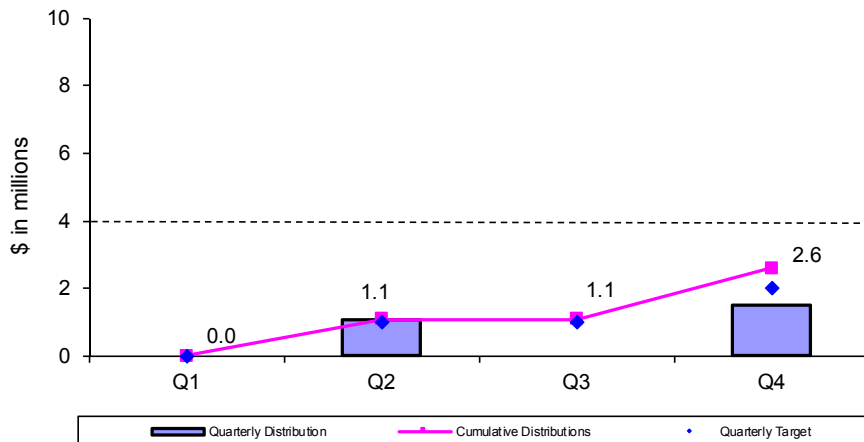
FY18 was the second year of the Lead Loan Program. During FY18, MWRA made five Lead Loan Program distributions as noted in the table below.

FY19 is the third year of the Lead Loan Program. Two Lead Loans were made during the fourth quarter of FY19: \$100,000,000 to Marlborough and \$0.5 Million to Winthrop.

Summary of Lead Loans:

Marlborough in FY19	\$1.0 Million
Winthrop in FY19	\$0.5 Million
Chelsea in FY19	\$0.1 Million
Everett in FY19	\$1.0 Million
Needham in FY18	\$1.0 Million
Winchester in FY18	\$0.5 Million
Revere in FY18	\$0.2 Million
Winthrop in FY18	\$0.3 Million
Marlborough in FY18	\$1.0 Million
Newton in FY17	\$4.0 Million
Quincy in FY17	\$1.5 Million
<u>Winchester in FY17</u>	<u>\$0.5 Million</u>
TOTAL	\$11.6 Million

FY19 Quarterly Distributions of Lead Service Line Replacement Loans

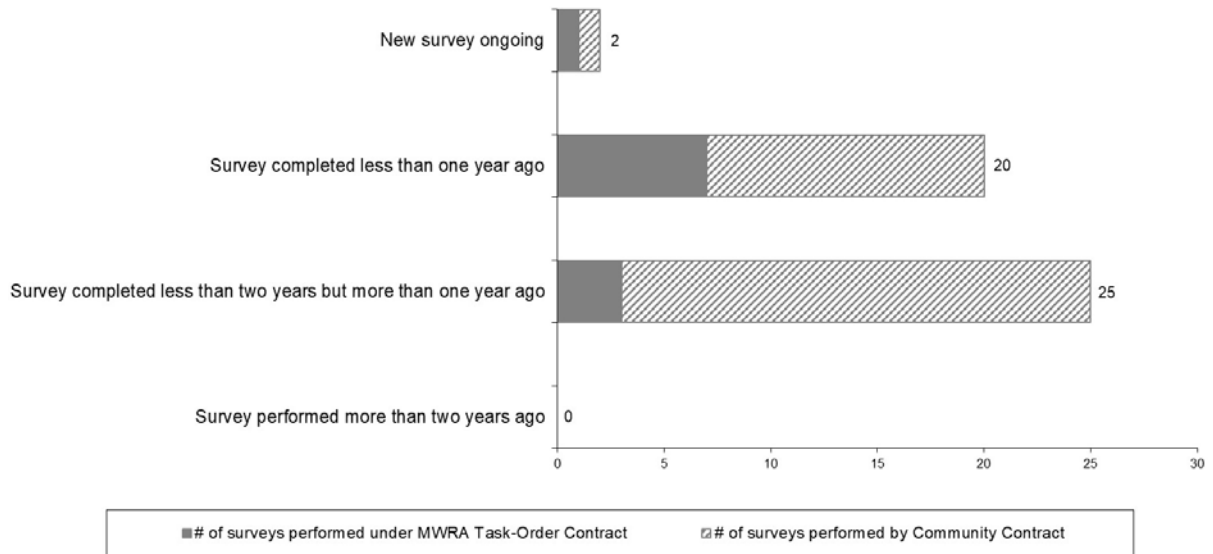


Community Support Programs

4th Quarter – FY19

Community Water System Leak Detection

To ensure member water communities identify and repair leaks in locally-owned distribution systems, MWRA developed leak detection regulations that went into effect in July 1991. Communities purchasing water from MWRA are required to complete a leak detection survey of their entire distribution system at least once every two years. Communities can accomplish the survey using their own contractors or municipal crews; or alternatively, using MWRA’s task order leak detection contract. MWRA’s task order contract provides leak detection services at a reasonable cost that has been competitively procured (3-year, low-bid contract) taking advantage of the large volume of work anticipated throughout the regional system. Leak detection services performed under the task order contract are paid for by MWRA and the costs are billed to the community the following year. During the 4th Quarter of FY19, all member water communities were in compliance with MWRA’s Leak Detection Regulation.



Community Water Conservation Outreach

MWRA’s Community Water Conservation Program helps to maintain average water demand below the regional water system’s safe yield of 300 mgd. Current 5-year average water demand is less than 205 mgd. The local Water Conservation Program includes distribution of water conservation education brochures (indoor and outdoor bill-stuffers) and low-flow water fixtures and related materials (shower heads, faucet aerators, toilet leak detection dye tabs, and instructions), all at no cost to member communities or individual customers. The Program’s annual budget is \$25,000 for printing and purchase of materials. Annual distribution targets and totals are provided in the table below. Distributions of water conservation materials are made based on requests from member communities and individual customers.

	Annual Target	Q1	Q2	Q3	Q4	Annual Total
Educational Brochures	100,000	690	10,753	61,917	10,204	83,564
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	1,738	1,635	3,042	1,157	7,572
Toilet Leak Detection Dye Tablets	-----	15,202	352	5,008	285	20,847

BUSINESS SERVICES

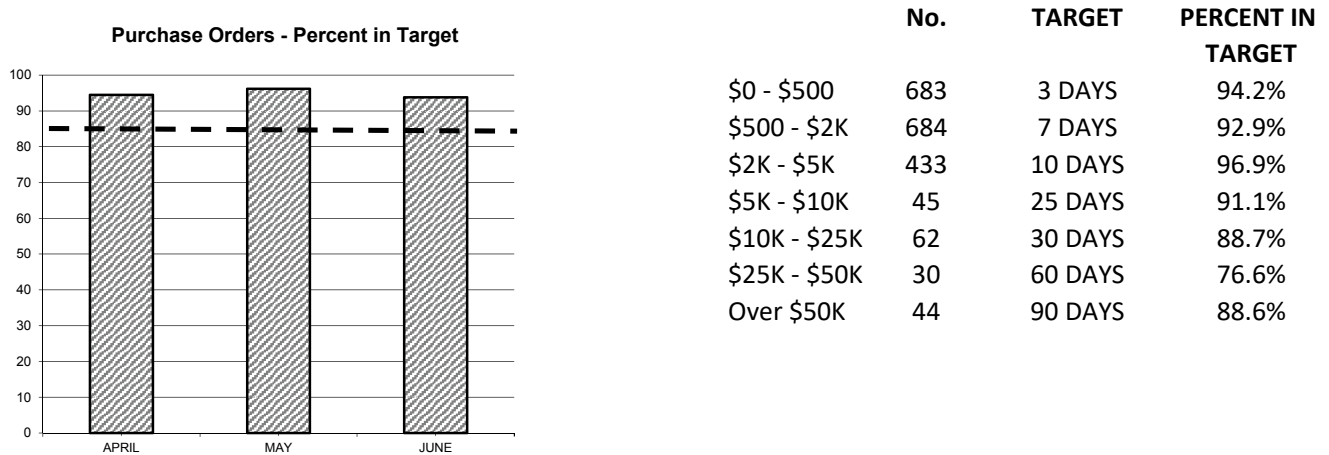
Procurement: Purchasing and Contracts

4th Quarter - FY19

Background: Goal is to process 85% of Purchase Orders and 80% of Contracts within Target timeframes.

Outcome: Processed 95% of purchase orders within target; Average Processing Time was 5.04 days vs. 5.54 days in Qtr 4 of FY18. Processed 42% (8 of 19) of contracts within target timeframes; Average Processing Time was 157 days vs. 122 days in Qtr 4 of FY18.

Purchasing



	No.	TARGET	PERCENT IN TARGET
\$0 - \$500	683	3 DAYS	94.2%
\$500 - \$2K	684	7 DAYS	92.9%
\$2K - \$5K	433	10 DAYS	96.9%
\$5K - \$10K	45	25 DAYS	91.1%
\$10K - \$25K	62	30 DAYS	88.7%
\$25K - \$50K	30	60 DAYS	76.6%
Over \$50K	44	90 DAYS	88.6%

The Purchasing Unit processed 1981 purchase orders, 36 less than the 2017 processed in Qtr 4 of FY18 for a total value of \$13,034,538 versus a dollar value of \$11,823,109 in Qtr 4 of FY18. The purchase order processing target was not met for the \$25K - \$50K category due to staff summary requirements.

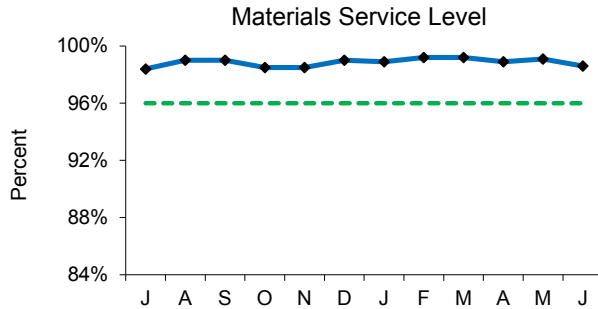
Contracts, Change Orders and Amendments

Eleven contracts were not processed within the target timeframes. One contract was delayed due to extensive negotiations of the contract terms as well as the terms of an associated software license. A second contract was delayed due to internal deliberations around qualifying requirements and the transition of the project after the retirement of staff. A third contract was delayed due to the need to address questions and comments from the selected vendor relative to MWRA insurance requirements and indemnification provisions. Another contract was delayed due to delays in receiving the signed contract from the consultant. A fifth contract was delayed due to the additional time required by the consultant to prepare backup documentation. Another contract was delayed due to the resignation of the consultant's proposed Project Manager prior to contract execution and the subsequent review, selection and approval of the replacement Project Manager by the MWRA. A seventh contract was delayed due to additional time required to check the contractor's references and another due to more time than anticipated being needed to edit specifications. A ninth contract was delayed due to delays in obtaining the contractor's bonds and insurance certificates. An additional contract was delayed due to staff retirement and the need for critical revisions to specifications prior to issuance. The final contract was delayed due to the proposer's delays in providing insurance and additional forms.

Procurement processed nineteen contracts with a value of \$25,487,021 and five amendments with a value of \$592,504. Thirty change orders were executed during the period. The dollar value of all non-credit change orders during Q4 FY19 was \$1,932,072 and the value of credit change orders was (\$1,796,805).

Staff reviewed 54 proposed change orders and 28 draft change orders.

Materials Management 4th Quarter - FY19



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,925 (98.9%) of the 8,014 items requested in Q4 from the inventory locations for a total dollar value of \$2,186,661.

Inventory Value - All Sites

Inventory goals focus on:

- Maintaining optimum levels of consumables and spare parts inventory
- Adding new items to inventory to meet changing business needs
- Reviewing consumables and spare parts for obsolescence
- Managing and controlling valuable equipment and tools via the Property Pass Program

The FY19 goal is to reduce consumable inventory from the July '18 base level (\$8.4 million) by 2.0% (approximately \$168,025), to \$8.2 million by June 30, 2019 (see chart below). Reduction fell short of the goal by \$14,100.

Items added to inventory this quarter include:

- Deer Island – relays, trip unit, circuit breakers and relay feeders for Electric Shop; check valves, regulators, pressure switches, actuator and gas monitor filters for I&C; reciprocating paint brushes for Machine Shop; compressor, bandsaw blade and thermostat for HVAC; flex couplings and filters for Power and Pump; actuator for Liquid Train.
- Chelsea – Cues lines, camera heads, tow cables, plate clamps, connectors, repair kits, springs, cables, gauges, wire, fittings, filter bags and filter tank for Work Coordination; gate guard pads for Safety; safety locks for Pipeline.
- Southboro – poison ivy towelettes for Grounds Aquaduct Maintenance.

Property Pass Program:

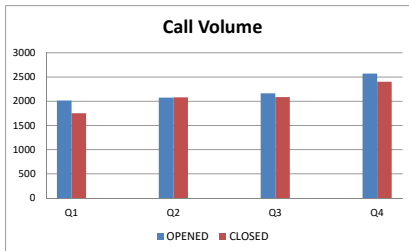
- One audit was conducted during Q4.
- Scrap revenue received for Q4 amounted to \$19,302. Year to date revenue received amounted to \$55,114.
- Revenue received from online auctions held during Q4 amounted to \$76,678. Year to date revenue received amounted to \$433,938.

Items	Base Value July-18	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,401,259	8,247,334	-153,925
Spare Parts Inventory Value	8,884,367	9,086,035	201,668
Total Inventory Value	17,285,626	17,333,369	47,743

Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

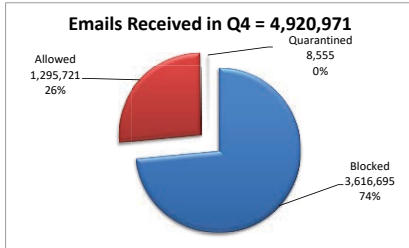
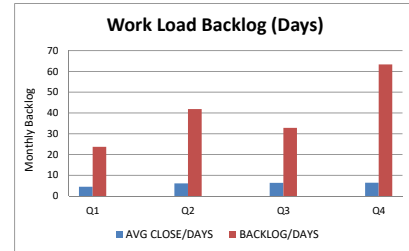
MIS Program

4th Quarter FY19



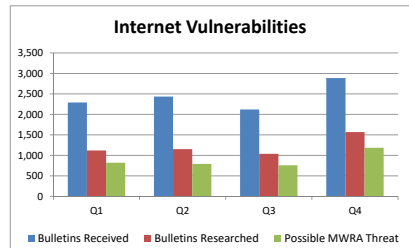
Performance & Backlog for Q4

- 93.47% of open calls were closed.
- Call closure averaged 6.4 days.
- Priority 1 & 2 Service Level Agreements (SLA) were not met because of priorities and delayed closure. Workarounds provided.



Information Security for Q4

- In Q4, pushed security fixes/updates to desktops/servers protecting against 204 vulnerabilities.
- McAfee quarantined 9 distinct viruses from 8 PCs. PCs are current with antivirus signatures for known malware.



Infrastructure:

Desktop Refresh: PC deployments are 99% complete.

Audio/Visual Upgrades: Chelsea Muster Room and CNY completed. Designs being reviewed for balance of conference rooms.

External Facing Server Hardware Replacement: 18 servers migrated to new infrastructure hardware. Telog system to be migrated once 4G migration has completed.

Network Router Replacement: Router replacements at 11 sites completed.

Cell Phone Upgrades: Completed.

iPhone Upgrades: Completed 73% of iPhone 8 upgrades.

Infrastructure Upgrades: Hardware being procured for Southboro, Clinton, and JCWTP.

DI Ops Hardware Segmentation: Hardware received and scheduled for installation in July.

Applications/Library & Records Center/Training:

Enterprise Content Management (ECM)/e-Construction: Working on business process workflows and/or use case documentation of existing E&C Department processes and data migration analysis. 47 use cases and 90 workflows are completed or nearly completed. 21 data sources are identified and documented and 200+ reports have been analyzed. Data sources include 4 InfoStar Document management systems and 17 related databases, which are intended to be replaced with the new system. Strategized an RFP process with Gartner and began reviewing over 600 possible critical capabilities identified by Gartner.

Contracts Management: Professional Services Contracts are the last significant contract type remaining to be implemented in the new Contracts Management application that already is being used for non-professional services, and Chapter 30 and Chapter 149 construction contracts. Completed preliminary set of user tests with Procurement Director and Subject Matter Experts (SMEs). Established final requirements for Professional Services bid tab access.

Dental Certifications Application: New federal regulations requiring sewer discharge permits for dental offices require an update to the PIMS permitting application. Requirements draft completed and sent to users and IT staff to review. Began working on a new user requirement to revise registration functionality to replicate that used by the state of Connecticut that allows dental offices to designate registration administrators.

GIS: GISPortal Viewer was updated to include two MassGIS layers, namely Activity and Use Limitation (AUL) and Chapter 21E sites, to aid in-house construction project planning. These new features will help identify MWRA pipelines within the mapped AUL area.

Lawson: The Lawson System Foundation Core Technology (LSFCT) has been upgraded to support Multi Browser (MS-Internet Explorer & Google Chrome) capability for the Lawson Portal.

Telog Application System Assessment: MWRA's Telog Application system assessment was completed by the vendor Engineering firm. A final assessment report was delivered. The review of the report is in process.

Library & Records Center: Library: undertook 22 research requests, supplied 75 new books for circulation, provided 49 books and reports on loan, accessed and distributed 21 articles, and 4 new standards. The MWRA Library Portal supported 780 end-user searches.

Record Center (RC): added 162 new boxes, 94 jars of soil samples, and 38 rock-core samples. Staff executed 22 rush request (info needed within 24hrs) scanned/emailed 147 pages of technical information and shredded nine, 65 gallon bins of confidential documents on site. The RC manager attended 1 RCB meeting and taught 3 record management classes.

IT Training: For the quarter, 177 staff (287 YTD) attended 28 (52 YTD) classes. 20% of the workforce has attended at least one class year-to-date. Windows 10 training were conducted in Chelsea, Charlestown, Deer Island, and Southboro. Windows 10 Job aids were created for removing printers and changing passwords.

Legal Matters

4th Quarter - FY19

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits:** Reviewed fifty-four (54) 8(m) permits.
- **Real Property:** Drafted grant of access easement and memorandum of understanding related to the potential relocation of MWRA's access easement at the Cumberland Farms, Inc. property located at 777 Dedham Street in Canton, MA for the future redevelopment of the property. Reviewed certificate of estoppel and fifth and sixth amendments to lease for MWRA's records center located at 34 St. Martin Drive, Marlborough, Massachusetts. Drafted two grants of temporary easements and two offers of purchase pursuant to M.G.L. c. 79 for the acquisition of two temporary easements in Dorchester and Milton needed for the construction of the Dorchester Interceptor Sewer Rehabilitation Project (MWRA Contract No. 7279). Finalized license from Baker Square Condominium Association related to MWRA's construction activities related to Dorchester Interceptor Sewer Rehabilitation (MWRA Contract No. 7279). Drafted license from Fore River Railroad Corporation to MBTA to allow MBTA to install, operate, and maintain one set of two transponders on the portion of the FRRRC tracks in Braintree where the FRRRC tracks meet the MBTA's Greenbush line tracks. Finalized easement language for MBTA's grant of a water easement to MWRA in Ball Square related to MBTA's relocation of a portion of MWRA's Section 65 water main as part of the MBTA's Green Line Extension Project. Reviewed Quabbin Watershed Preservation Restriction, W-001198, related to Pope property on New Salem Road in Petersham, MA, Quabbin Watershed Preservation Restriction Acquisition, W-001177, related to Butterworth property off Pat Connor Road in Petersham, MA, and Wachusett Watershed Fee Acquisition, W-001179, related to Rotti property off Fairbanks Street in West Boylston, MA. Drafted six (6) one-day licenses for public events on the Harborwalk Perimeter Pathway at DITP.
- **Boston Harbor Case:** Reviewed Semiannual Compliance and Progress Report and Semiannual CSO Discharge Report No. 2. Reviewed MWRA's LTCP CSO performance assessment semiannual report 2.
- **Environmental:** Reviewed DEP's Tentative Determinations to adopt variances for CSO discharges to Alewife Brook/Upper Mystic River and the Lower Charles River/Charles River Basin. Reviewed PCB notices of restriction pursuant to 40 CFR § 761.61 for Wachusett Dam and for Alewife Brook Pump Station.
- **Energy:** Prepared draft Demand Demonstration Project-Utility Tariff Optimization Service and Site License Agreement for two potential battery storage projects at MWRA facilities. Processed the re-execution of MWRA's Oakdale and Cosgrove Hydro Qualifying Facility Agreements with National Grid, which allow for National Grid's ongoing purchase of excess hydroelectric energy generated by MWRA's Oakdale and Cosgrove hydro facilities.
- **Public Records Requests:** During the fourth quarter of 2019, MWRA received one hundred and forty-three (143) and responded to one hundred and forty-four (144) public records requests.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

Four demands for arbitration were filed.

A Charge was filed at the Massachusetts Commission Against Discrimination alleging that the MWRA discriminated against an employee on the basis of age.

A Charge was filed at the Massachusetts Commission Against Discrimination alleging that the MWRA discriminated against an employee on the basis of sex, sexual harassment and retaliation.

Matters Concluded

Received a dismissal from the MCAD for lack of probable cause of a charge of discrimination on the basis of age.

LITIGATION/CLAIMS

New lawsuits/claims:

Shea v. MWRA: Suffolk Sup. Ct., No. 2019 CV 01847: Plaintiff initiated an action against MWRA related to his termination. Plaintiff's complaint alleges discrimination on the basis of his race and record handicap in violation of Chapter 151B. Plaintiff's complaint also alleges unlawful retaliation for seeking workers compensation benefits, wrongful termination based on violation of public policy and violation of earned sick time. MWRA denies the Plaintiff's allegations and asserts that the termination was for legitimate reasons, with no discriminatory animus or retaliation on the part of MWRA. Plaintiff seeks trial by jury.

Significant Developments

(Current Employee) v. MWRA: Suffolk Sup. Ct., No. 16-03708E: Depositions of all MWRA witnesses were completed during the month of May and discovery is now closed.

DaPrato v. MWRA: Suffolk Sup. Ct., No. 2015 CV 3687 D: The Supreme Judicial Court issued its opinion on June 5, 2019 denying MWRA's appeal in full and affirming the jury's judgment and the court's award of liquidated damages, attorneys' fees and costs.

BHD/BEC JV2015 v. MWRA: Suffolk Sup. Ct., No. 2018 CV 03477: The parties have entered into a settlement agreement to resolve plaintiff contractor's claims for compensation arising out of alleged unforeseen subsurface conditions and the solar equipment foundations on the Wachusett Aqueduct Pumping Station project. Final papers dismissing the lawsuit are expected to be filed with the Suffolk Superior Court in July 2019.

Closed Cases/Claims:

Law Offices of Burton J. Hass v. MWRA, Frederick A. Laskey, et al.; Suffolk Sup. Ct., No. 1984-CV-634H: By order dated April 11, 2019, the Court allowed MWRA's motion to dismiss Plaintiff's complaint against MWRA having received no opposition from the Plaintiff.

Subpoenas During the Fourth Quarter of FY 2019, no subpoenas were received, one subpoena was closed, and no subpoenas were pending at the end of the Fourth Quarter FY 2019.

Wage Garnishments There are currently 14 Trustee Process matters, four of which are considered active and are monitored by Law Division.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of June 2019	As of March 2019	As of Dec 2018
Construction/Contract/Bid Protest (other than BHP)	3	3	3
Tort/Labor/Employment	5	5	4
Environmental/Regulatory/Other	2	2	2
Eminent Domain/Real Estate	0	0	0
Total	10	10	9
Other Litigation matters (restraining orders, etc.)	1	1	2
Total – all pending lawsuits	11	11	11
Claims not in suit:	1	1	2
Bankruptcy	0	0	0
Wage Garnishment	4	4	4
TRAC/Adjudicatory Appeals	1	1	1
Subpoenas	0	1	1
TOTAL – ALL LITIGATION MATTERS	17	18	19

TRAC/MISC.

New Appeals: There is one new appeal:
The Midtown Hotel; MWRA Docket No. 19-02

Settlement by Agreement Of Parties Howard Johnsons Hotel – Quincy; MWRA 19-01

Stipulation of Dismissal No Joint Stipulation of Dismissals filed.

Notice of Dismissal Fine paid in full No Notices of Dismissal, Fine Paid in Full.

Tentative Decision There are no Tentative Decisions issued in the 4th Quarter FY19.
Final Decisions There are no Final Decisions issued in the 4th Quarter FY19.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES 4th Quarter - FY19

Highlights

During the 4th quarter FY19, IA completed a review of Purchase Card activity to determine compliance with current policies and procedures. Management has actively closed 9 out of the 11 recommendations made, including amending the manual to provide documentation requirements for management authorizations for certain purchases, reminding cardholders of importance of timeliness when submitting monthly reconciliations for review and approval, and specifying record retention requirements. In addition, IA also completed 3 consultant preliminary reviews, 2 construction labor burden reviews, a prevailing wage review of the cleaning contractor, the CNY lease true-up for 2018 and the NEFCo claim due to storage reductions.

Status of Recommendations

During FY19, 27 recommendations were closed of which 4 are from prior fiscal years' audits.

IA follows-up on open recommendations on a continuous basis. All open recommendations have target dates for implementation. When a recommendation has not been implemented within 48 months, the appropriateness of the recommendation is re-evaluated.

All Open Recommendations Pending Implementation – Aging Between 0 and 48 Months

Report Title (issue date)	Audit Recommendations		
	Open	Closed	Total
MIS Mobile Equipment Asset Tracking (9/26/16)	1	11	12
Wright Express (WEX) Credit Card Fuel Purchases (11/16/16)	1	12	13
Purchase Card Activity on Deer Island (3/31/17)	2	13	15
Review of Uniform Debit Card Program (3/30/18)	2	4	6
Review of MWRA Procedures on Payments for Police Details (5/23/18)	1	0	1
Overtime & Timesheet Review (6/30/18)	2	14	16
Fleet Services Process Review (6/30/18)	4	1	5
Fuel Use & Mileage Tracking (12/31/18)	7	1	8
Review of Purchase Card Activity (5/23/19)	2	9	11
Total Recommendations	22	65	87

Cost Savings

IA's target is to achieve at least \$1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

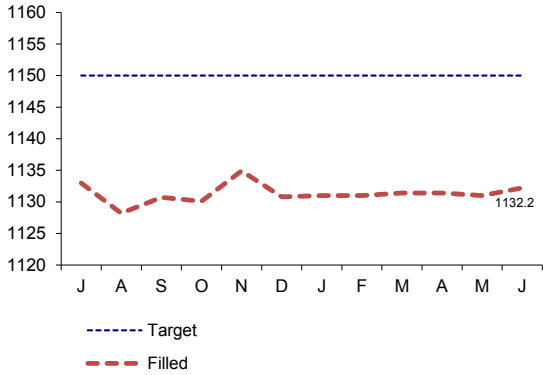
Cost Savings	FY15	FY16	FY17	FY18	FY19 Q4	TOTAL
Consultants	\$87,605	\$88,312	\$272,431	\$118,782	\$262,384	\$829,514
Contractors & Vendors	\$1,146,742	\$1,772,422	\$3,037,712	\$1,323,156	\$3,152,884	\$10,432,916
Internal Audits	\$543,471	\$220,929	\$224,178	\$204,202	\$210,063	\$1,402,843
Total	\$1,777,818	\$2,081,663	\$3,534,321	\$1,646,140	\$3,625,331	\$12,665,273

OTHER MANAGEMENT

Workforce Management

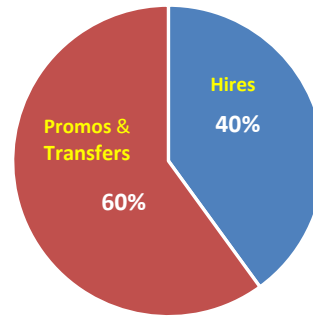
4th Quarter - FY19

FTE Tracking



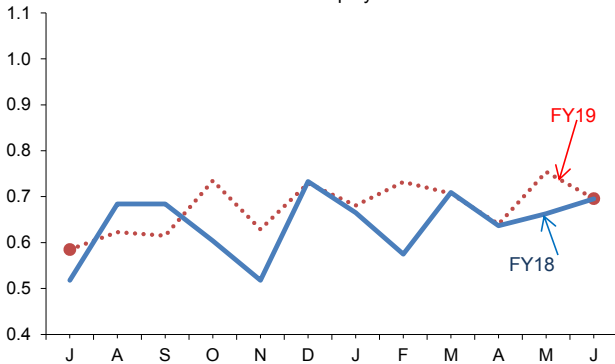
FY19 Target for FTE's = 1150
 FTE's as of June 2019 = 1132.2
 Tunnel Redunancy as of June 2019 = 7.0

Position Filled by Hires/Promos & Transfer for YTD



	Pr/Trns	Hires	Total
FY17	155 (68%)	72 (32%)	227
FY18	118 (61%)	74 (39%)	192
FY19	113 (60%)	76 (40%)	189

Average Monthly Sick Leave Usage Per Employee

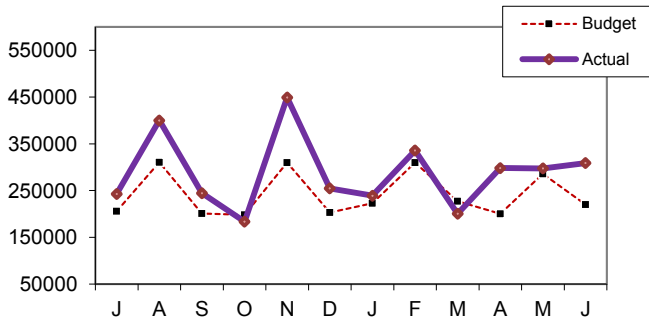


Average monthly sick leave for the 4th Quarter of FY19 increased as compared to the 4th Quarter of FY18 (8.12 to 7.68)

	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY18
Admin	137	7.79	7.79	14.1%	6.6
Aff. Action	5	7.05	7.05	13.5%	7.1
Executive	4	2.28	2.28	22.6%	3.3
Finance	32	6.28	6.28	0.0%	6.1
Int. Audit	6	4.06	4.06	5.8%	4.9
Law	13	7.80	7.80	9.0%	6.9
OEP	4	5.97	5.97	100.0%	3.6
Operations	933	8.36	8.36	16.8%	7.7
Tunnel Red	7	8.11	8.11	70.4%	0
Pub. Affs.	11	4.45	4.45	15.2%	10.4
MWRA Avg	1152	8.13	8.13	16.4%	7.7

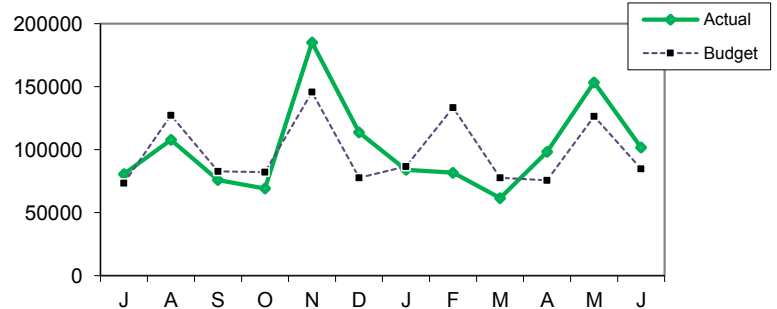
Percent of sick leave usage for FY19, attributable to Family and Medical Leave Act (FMLA) is 16.4% .

Field Operations
Current Month Overtime \$



Total Overtime for Field Operations for the fourth quarter of 2019 was \$904,254 which is \$198k over budget. Emergency overtime was \$502k, which was \$131k over budget. Rain events totaled \$369k, Emergency Maintenance was \$42k, Emergency operations was \$30k, and CSO activation was \$24k. Coverage overtime was \$201k, which was \$36k over budget, reflecting the month's shift coverage requirements. Planned overtime was \$201k or \$30k over budget, Maintenance off hours work was \$94k, planned operations was \$25k, community assistance was \$23k. YTD, FOD has spent \$3,454,804 on overtime which is \$560k over budget.

Deer Island Treatment Plant
Current Month Overtime \$

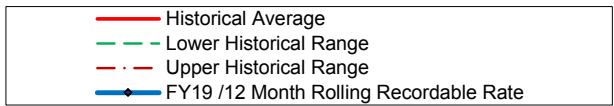
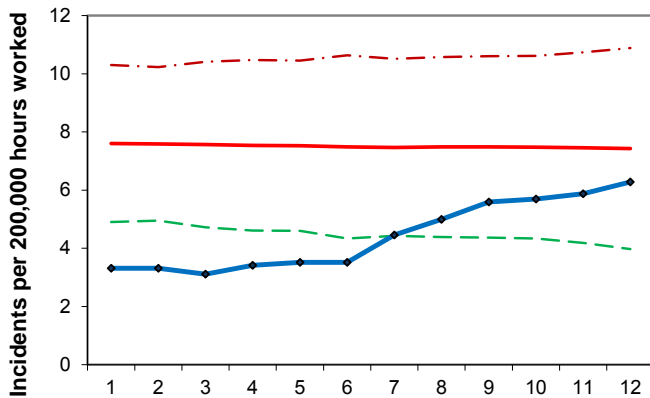


Deer Island's total overtime expenditure for the fourth quarter was \$353,442, which was \$66k or 23.2% over budget for the quarter. During the fourth quarter Deer Island experienced higher than anticipated unplanned emergencies/storm coverage of \$66k and shift coverage of \$18k. This was offset by lower spending for planned/unplanned overtime of (\$18k) for the quarter. YTD Deer Island's overtime spending is \$1,213,319 which is \$39k or 3.3% over budget mostly due to higher spending for storm coverage of \$215k primarily in November, December, April, and May due to high rains and flows and shift coverage of \$32k; offset by lower planned/unplanned overtime of (\$208k).

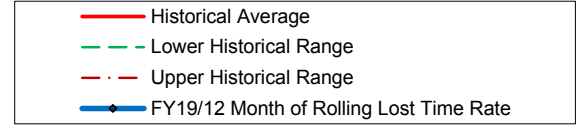
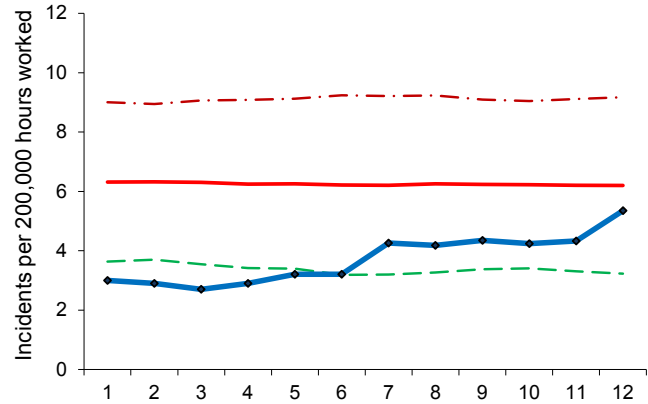
Workplace Safety

4th Quarter - FY19

Recordable Injury & Illness Rates



Lost Time Injury & Illness Rates



- "Recordable" incidents are all work-related injuries and illnesses which result in death, loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid. Each month this rate is calculated using the previous 12 months of injury data.
- "Lost-time" incidents, a subset of the recordable incidents, are only those incidents resulting in any days away from work, days of restricted work activity or both - beyond the first day of injury or onset of illness. Each month this rate is calculated using the previous 12 months of injury data.
- The "Historical Average" is computed using the actual MWRA monthly incident rates for FY99 through FY18. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively.
- With Changes in state law, in February 1, 2019, MWRA began record keeping and reporting according to Federal OSHA standards for injury and illness record keeping. Strictly adhering to the federal OSHA reporting regulation has caused an increase in recorded injuries and illnesses. This increase is causing both the Recordable injury and illness Rate and the Lost Time Injury and Illness rate to trend higher than in past years but does not necessarily mean there is an increase in injuries or illnesses. OSHA injuries and illnesses, and lost time are recorded differently than the Massachusetts Workers' Compensation standards and could result in an increase in the OSHA rate while the Workers' Compensation claims are decreasing. Over time, the rise on the charts should stabilize as new data replaces the older data..

WORKERS COMPENSATION HIGHLIGHTS

	4th Quarter Information		
	New	Closed	Open Claims
Lost Time	2	26	46
Medical Only	28	31	28
Report Only	23	25	
	QYTD		FYTD
Regular Duty Returns	11		39
Light Duty Returns	0		0

COMMENTS:

Regular Duty Returns

APR 4 Employees returned to full duty/no restrictions
MAY 5 Employees returned to full duty/no restrictions
JUNE 2 Employees returned to full duty/no restrictions

Light Duty Returns

APR N/A
MAY N/A
JUNE N/A

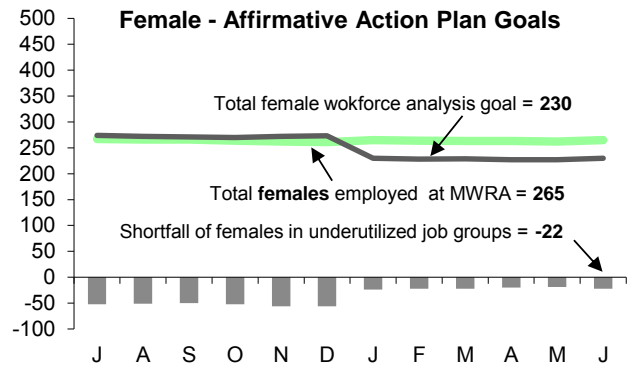
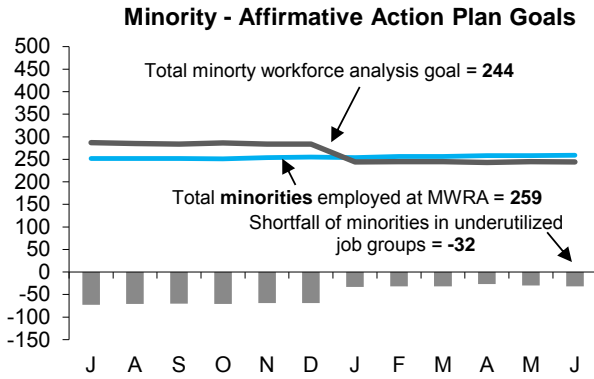
Note: Claims may initially be counted in one category and changed to another category at a later date.

Examples include a medical treatment only claim (no lost time from work) but the employee may require surgery at a later date resulting in the claim becoming a lost time claim. At that time we would only count the claim as opened but not as a new claim.

*Report only claims are closed the month they are filed.

MWRA Job Group Representation

4th Quarter - FY19



Highlights:

At the end of Q4 FY19, 7 job groups or a total of 32 positions are underutilized by minorities as compared to 8 job groups for a total of 44 positions at the end of Q4 FY18; for females 6 job groups or a total of 22 positions are underutilized females as compared to 7 job groups or a total of 62 positions at the end of Q4 FY18. During Q4, 7 minorities and 6 females were hired. During this same period 4 minorities and 3 females were terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 6/30/2019	Minorities as of 6/30/2019	Achievement Level	Minority Over or Under Underutilized	Females As of 6/30/2019	Achievement Level	Female Over or Under Underutilized
Administrator A	23	2	3	-1	10	7	3
Administrator B	25	1	5	-4	7	5	2
Clerical A	28	10	6	4	25	18	7
Clerical B	25	8	5	3	7	10	-3
Engineer A	80	29	16	13	17	19	-2
Engineer B	57	17	13	4	12	11	1
Craft A	116	18	22	-4	0	3	-3
Craft B	148	21	28	-7	3	7	-4
Laborer	70	19	16	3	4	3	1
Management A	97	20	23	-3	32	38	-6
Management B	43	9	9	0	10	5	5
Operator A	64	4	13	-9	1	1	0
Operator B	69	18	11	7	4	1	3
Professional A	29	3	7	-4	18	14	4
Professional B	162	45	42	3	80	60	20
Para Professional	57	18	12	6	27	16	11
Technical A	52	14	12	2	7	11	-4
Technical B	7	3	1	2	1	1	0
Total	1152	259	244	47/-32	265	230	57/-22

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/Transfers	AACU Ref. External	Position Status
Craft A	Sr. WDS Foreman	1	Int	1	0	Promo =WM
Craft A	Unit Supervisor, Instrumentation	1	Int	1	0	Promo =WM
Craft B	Plumber/Pipefitter	2	Ext.	0	0	2NH = (BM) (WM)
Craft B	HVAC Specialist	1	Ext	0	0	NH = WM
Craft B	Heavy Equipment Operator	1	Int	1	0	Promo =WM
Craft B	Jr. Instrument Technician	1	Ext	0	0	NH = WM
Management A	Program Manager	1	Int.	1	0	Promo = WF
Management A	Program Manager, Energy	1	Int/Ext	0	0	NH = AM
Management A	Deputy Contracts Manager	1	Ext	0	0	NH = BF
Management B	Asset Control Supervisor	1	Int.	1	0	Promo = WF
ParaProfessional	Administrative Systems Coordinator	1	Ext.	0	1	NH = BF
Professional A	Sr. Contracts Administrator	1	Int.	1	0	Promo =WF
Professional B	Manager, Employment	1	Int	1	0	Promo =BF
Operator A	Transmission & Treatment Operator	1	Int/Ext	0	0	NH = WM
Operator A	Area Supervisor	2	Int/Ext	2	0	2LT = (2WM)
Technical A	C&C Technican	1	Int.	1	0	LT =WM

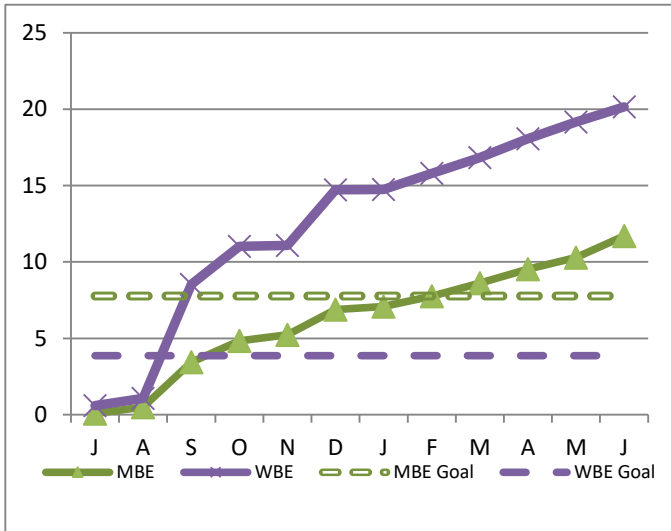
MBE/WBE Expenditures

4th Quarter - FY19

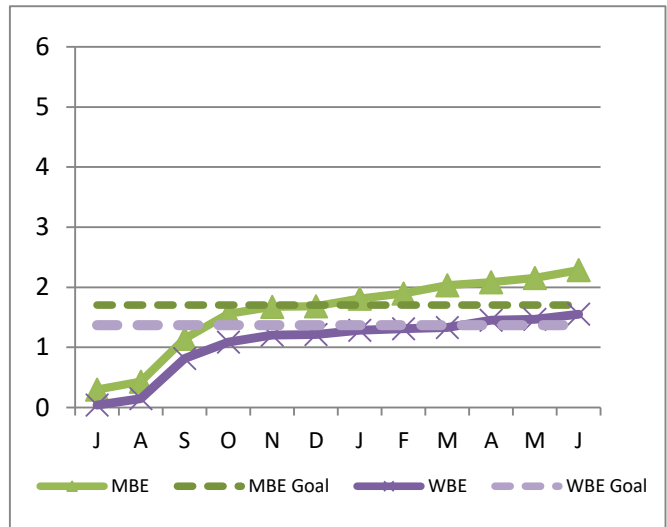
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY19 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they have no MBE/WBE spending goals.

MBE/WBE percentages are the results from a 2002 Availability Analysis, and MassDEP's Availability Analysis. As a result of the Availability Analyses, the category of Non-Professional Services is included in Goods/Services. Consistent with contractor reporting requirements, MBE/WBE expenditure data is available through June.

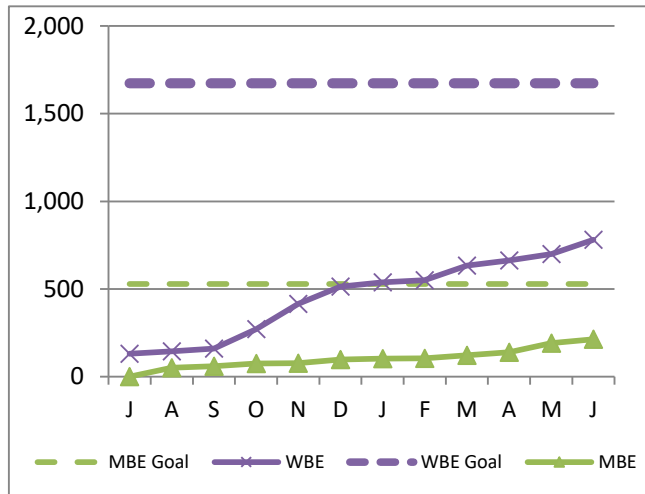
Construction (millions \$)



Professional Services (millions \$)



Goods/Services (Thousands \$)



FY19 spending and percentage of goals achieved, as well as FY18 performance are as follows:

MBE			
FY19 YTD		FY18	
Amount	Percent	Amount	Percent
11,699,641	150.6%	12,337,140	169.4%
2,285,171	134.1%	1,680,583	89.2%
213,198	40.3%	183,744	39.8%
14,198,010	142.0%	14,201,467	298.4%

WBE			
FY19 YTD		FY18	
Amount	Percent	Amount	Percent
20,152,509	521.8%	15,875,719	438.4%
1,551,120	113.2%	1,196,643	79.0%
780,760	46.7%	786,485	78.9%
22,484,389	325.6%	17,858,847	596.3%

Construction
Prof Svcs
Goods/Svcs
Totals

FY19 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

MWRA FY19 CEB Expenses

4th Quarter – FY19

As of June 2019, total expenses are \$758.8 million, \$9.1 million or 1.2% lower than budget, and total revenue is \$772.3 million, \$4.4 million or 0.6% over budget, for a net variance of \$13.5 million.

Expenses –

Direct Expenses are \$233.7 million, \$5.9 million or 2.5% under budget.

- **Wages & Salaries** are under budget by \$4.7 million or 4.4%. Regular pay is \$4.7 million under budget, due to lower head count, and timing of backfilling positions. YTD through June, the average Full Time Equivalent (FTE) positions was 1,136, nineteen fewer than the 1,155 FTE's budgeted.
- **Utilities** expenses are \$1.6 million or 6.9% over budget due to overspending of \$1.4 million on electricity primarily at Deer Island, \$890k, and in Field Operations, \$457k, reflecting a new contract retroactive to November 2018.
- **Professional Services** expenses are \$1.5 million under budget or 19.3%, primarily due to under spending in Other Professional Services of \$569k, Legal Services of \$305k, Engineering of \$224k, Lab Testing & Analysis of \$216k, and Computer System Consultants of \$155k.
- **Ongoing Maintenance** expense \$1.6 million under budget or 5.0%, reflecting the timing of projects.
- **Fringe Benefits** expenses are \$1.2 million or 5.6% under budget reflecting lower health insurance cost of \$1.1 million again due to lower head count.
- **Other Services** expenses are \$704k or 3.1% over budget reflecting higher processing volume at pelletization plant of \$1.2 million, partially offset by lower spending on Telecommunication Services of \$326k and Other Services of \$276k.
- **Overtime** expenses are \$761k or 17.1% over budget due to wet weather events.

Indirect Expenses are \$43.4 million, \$2.5 million or 5.5% under budget reflecting lower than budgeted Watershed Reimbursement of \$3.0 million, partially offset by increased spending on Insurance of \$650k due to greater than anticipated claims.

Debt Service Expenses totaled \$481.7 million, \$0.6 million under budget after the transfer of \$16.7 million to the Defeasance Account. Of the \$16.7 million transferred to the Defeasance Account, \$7.2 million represents year to date savings due to lower than budgeted variable interest rates and \$7.4 million in additional interest savings due to timing of SRF borrowing and lower costs than budgeted for senior debt borrowing.

Revenue and Income –

Total Revenue and Income is \$772.3 million, \$4.4 million higher than budget, primarily due to greater than budgeted investment income reflecting higher returns of \$3.4 million, the Disposal of Equipment of \$427k, and Miscellaneous Revenue of \$209k.

	June 2019 Year-to-Date			
	Period 12 YTD Budget	Period 12 YTD Actual	Period 12 YTD Variance	%
EXPENSES				
WAGES AND SALARIES	\$ 107,032,021	\$ 102,331,904	\$ (4,700,117)	-4.4%
OVERTIME	4,447,554	5,208,556	761,002	17.1%
FRINGE BENEFITS	21,173,571	19,982,221	(1,191,350)	-5.6%
WORKERS' COMPENSATION	2,422,609	2,717,568	294,959	12.2%
CHEMICALS	10,830,452	10,891,948	61,496	0.6%
ENERGY AND UTILITIES	22,868,632	24,446,278	1,577,646	6.9%
MAINTENANCE	32,258,727	30,650,570	(1,608,157)	-5.0%
TRAINING AND MEETINGS	455,770	499,836	44,066	9.7%
PROFESSIONAL SERVICES	7,675,976	6,194,703	(1,481,273)	-19.3%
OTHER MATERIALS	7,381,098	6,987,854	(393,244)	-5.3%
OTHER SERVICES	23,065,411	23,769,299	703,888	3.1%
TOTAL DIRECT EXPENSES	\$ 239,611,821	\$ 233,680,737	\$ (5,931,085)	-2.5%
INSURANCE	\$ 2,099,064	\$ 2,748,983	\$ 649,919	31.0%
WATERSHED/PILOT	26,406,427	23,411,908	(2,994,519)	-11.3%
HEEC PAYMENT	1,386,832	1,191,990	(194,842)	-14.0%
MITIGATION	1,614,262	1,614,263	1	0.0%
ADDITIONS TO RESERVES	1,881,797	1,881,797	-	0.0%
RETIREMENT FUND	7,000,000	7,000,000	-	0.0%
POST EMPLOYEE BENEFITS	5,574,152	5,574,152	-	0.0%
TOTAL INDIRECT EXPENSES	\$ 45,962,534	\$ 43,423,093	\$ (2,539,441)	-5.5%
STATE REVOLVING FUND	\$ 89,380,363	\$ 84,227,800	\$ (5,152,563)	-5.8%
SENIOR DEBT	272,633,982	287,497,793	14,863,811	5.5%
DEBT SERVICE ASSISTANCE	(944,726)	(1,834,965)	(890,239)	94.2%
CURRENT REVENUE/CAPITAL	14,199,991	14,200,000	9	0.0%
SUBORDINATE MWRA DEBT	92,032,292	92,032,293	1	0.0%
LOCAL WATER PIPELINE CP	4,750,396	2,540,172	(2,210,224)	-46.5%
CAPITAL LEASE	3,217,060	3,217,060	-	0.0%
DEBT PREPAYMENT	7,100,000	7,100,000	-	0.0%
VARIABLE DEBT	-	(7,243,421)	(7,243,421)	---
DEFEASANCE ACCOUNT	-	-	-	---
TOTAL DEBT SERVICE	\$ 482,369,358	\$ 481,736,732	\$ (632,626)	-0.1%
TOTAL EXPENSES	\$ 767,943,713	\$ 758,840,562	\$ (9,103,152)	-1.2%
REVENUE & INCOME				
RATE REVENUE	\$ 739,042,200	\$ 739,042,200	\$ -	0.0%
OTHER USER CHARGES	9,328,768	9,346,469	17,701	0.2%
OTHER REVENUE	6,013,635	6,947,076	933,441	15.5%
RATE STABILIZATION	-	-	-	---
INVESTMENT INCOME	13,559,110	16,985,523	3,426,413	25.3%
TOTAL REVENUE & INCOME	\$ 767,943,713	\$ 772,321,268	\$ 4,377,555	0.6%

Cost of Debt 4th Quarter – FY19

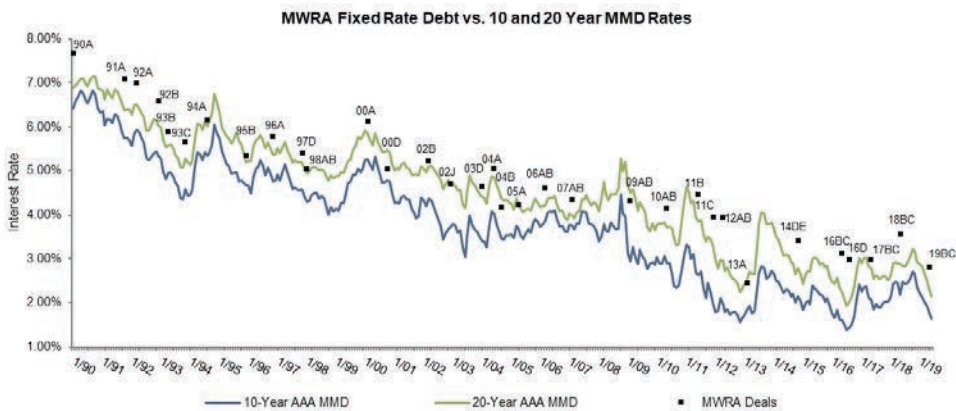
MWRA borrowing costs are a function of the fixed and variable tax exempt interest rate environment, the level of MWRA's variable interest rate exposure and the perceived creditworthiness of MWRA. Each of these factors has contributed to decreased MWRA borrowing costs since 1990.

Average Cost of MWRA Debt FYTD

Fixed Debt (\$3.50 billion)	3.72%
Variable Debt (\$418.9 million)	2.07%
SRF Debt (\$979.9 million)	1.51%
Weighted Average Debt Cost (\$4,899billion)	3.14%

Most Recent Senior Fixed Debt Issue May 2019

2019 Series B & C (\$144.2 million) 2.82 %

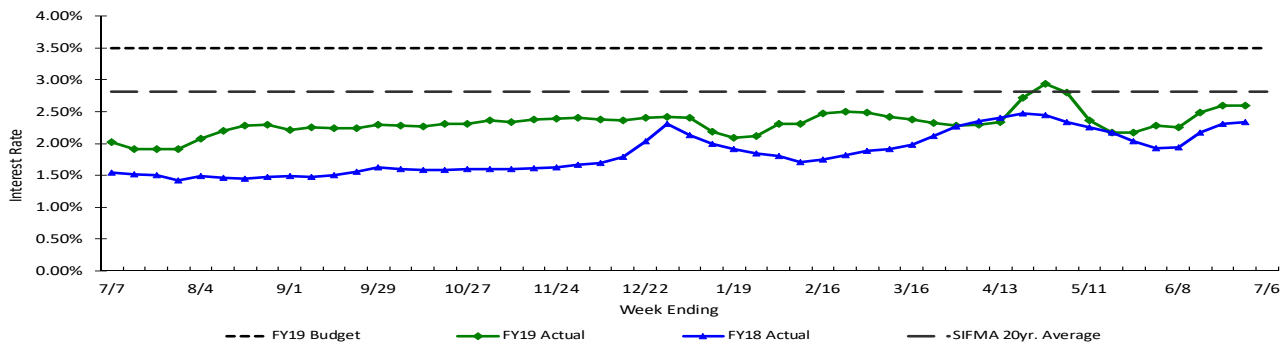


Bond Deal	1993C	1994A	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A	2004B	2005A
Rate	5.66%	6.15%	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%	4.17%	4.22%
Avg Life	19.1 yrs	19.5 yrs	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs	13.5 yrs	18.4 yrs

Bond Deal	2006AB	2007AB	2009AB	2010AB	2011B	2011C	2012AB	2013A	2014D-F	2016BC	2016D	2017BC	2018BC	2019BC
Rate	4.61%	4.34%	4.32%	4.14%	4.45%	3.95%	3.93%	2.45%	3.41%	3.12%	2.99%	2.98%	3.56%	2.82%
Avg Life	25.9 yrs	24.4 yrs	15.4 yrs	16.4 yrs	18.8 yrs	16.5 yrs	17.9 yrs	9.9 yrs	15.1 yrs	17.4 yrs	18.8yrs	11.2 yrs	11.7yrs	11.9yrs

Weekly Average Variable Interest Rates vs. Budget

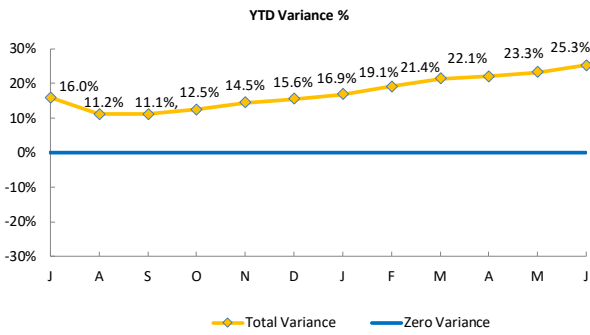
MWRA currently has eleven variable rate debt issues with \$782.2 million outstanding, excluding commercial paper. Of the eleven outstanding series, four have portions, which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In June, SIFMA rates ranged from a high of 1.90% to a low of 1.40% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate risk as compared to fixed rate debt.



Investment Income

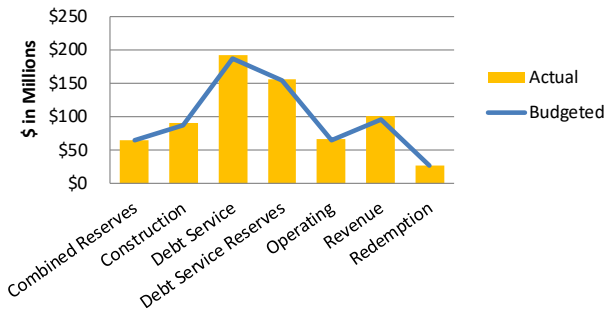
4th Quarter – FY19

Year To Date

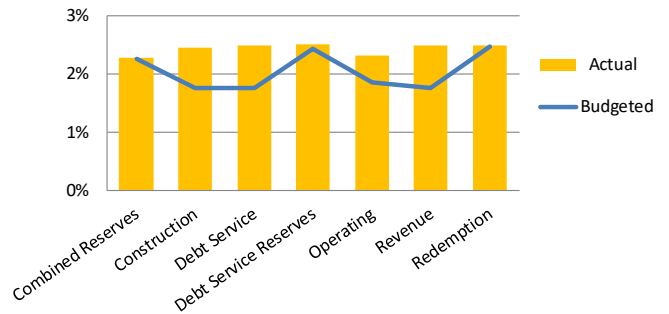


	YTD BUDGET VARIANCE (\$000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	\$25	\$10	34	2.4%
Construction	\$50	\$635	685	44.8%
Debt Service	\$76	\$1,404	1,481	45.2%
Debt Service Reserves	\$7	\$120	127	3.4%
Operating	\$33	\$225	258	21.3%
Revenue	\$88	\$750	837	50.2%
Redemption	\$0	\$4	4	0.6%
Total Variance	\$279	\$3,147	\$3,426	25.3%

YTD Average Balances Budgeted vs. Actual

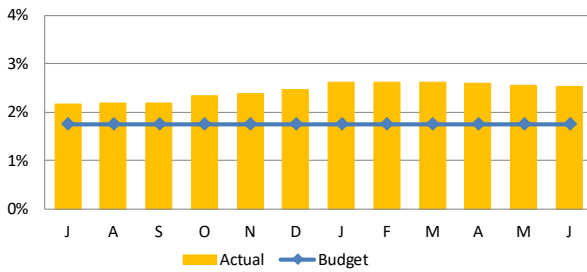


YTD Average Interest Rate Budgeted vs. Actual

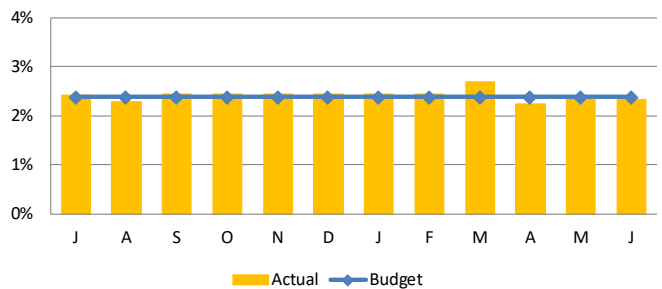


Monthly

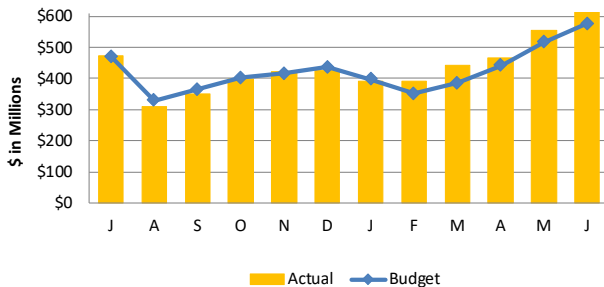
Short -Term Interest Rates



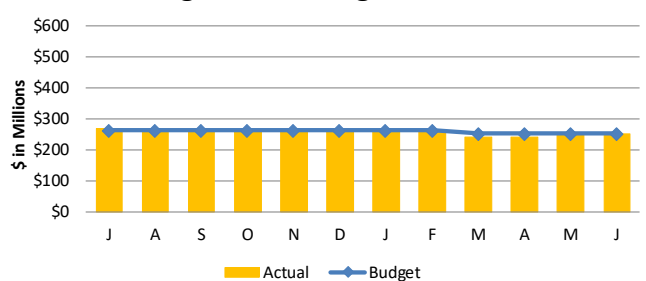
Long -Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances



STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Delegated Authority Report – July and August 2019

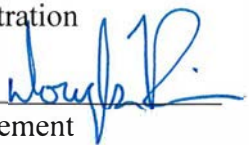


COMMITTEE: Administration, Finance & Audit

INFORMATION
 VOTE


Michele S. Gillen
Director, Administration

Linda Grasso, Admin. Systems Coordinator
Barbara Aylward, Administrator A & F
Preparer/Title


Douglas J. Rice
Director of Procurement

RECOMMENDATION:

For information only. Attached is a listing of actions taken by the Executive Director under delegated authority for the period July 1 – August 31, 2019.

This report is broken down into three sections:

- Awards of Construction, non-professional and professional services contracts and change orders and amendments in excess of \$25,000, including credit change orders and amendments in excess of \$25,000;
- Awards of purchase orders in excess of \$25,000; and
- Amendments to the Position Control Register, if applicable.

BACKGROUND:

The Board of Directors' Management Policies and Procedures, as amended by the Board's vote on February 21, 2018, delegate authority to the Executive Director to approve the following:

Construction Contract Awards:

Up to \$1 million if the award is to the lowest bidder.

Change Orders:

Up to 25% of the original contract amount or \$250,000, whichever is less, where the change increases the contract amount, and for a term not exceeding an aggregate of six months; and for any amount and for any term, where the change decreases the contract amount. The delegations for cost increases and time can be restored by Board vote.

Professional Service Contract Awards:

Up to \$100,000 and one year with a firm; or up to \$50,000 and one year with an individual.

Non-Professional Service Contract Awards:

Up to \$250,000 if a competitive procurement process has been conducted, or up to \$100,000 if a procurement process other than a competitive process has been conducted.

Purchase or Lease of Equipment, Materials or Supplies:

Up to \$1 million if the award is to the lowest bidder.

Amendments:

Up to 25% of the original contract amount or \$250,000, whichever is less, and for a term not exceeding an aggregate of six months.

Amendments to the Position Control Register:

Amendments which result only in a change in cost center.

BUDGET/FISCAL IMPACT:

Recommendations for delegated authority approval include information on the budget/fiscal impact related to the action. For items funded through the capital budget, dollars are measured against the approved capital budget. If the dollars are in excess of the amount authorized in the budget, the amount will be covered within the five-year CIP spending cap. For items funded through the Current Expense Budget, variances are reported monthly and year-end projections are prepared at least twice per year. Staff review all variances and projections so that appropriate measures may be taken to ensure that overall spending is within the MWRA budget.

CONSTRUCTION/PROFESSIONAL SERVICES DELEGATED AUTHORITY ITEMS JULY 1 - 31, 2019

NO.	DATE OF AWARD	TITLE AND EXPLANATION	CONTRACT	AMEND/CO	COMPANY	FINANCIAL IMPACT
C-1.	07/08/19	DEMOLITION OF OREN NICHOLS BUILDINGS AND REMOVAL OF ASBESTOS CONTAINING MATERIALS AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR DEMOLITION OF THE OREN NICHOLS BUILDINGS IN SOUTHBOROUGH AND REMOVAL OF ASBESTOS CONTAINING MATERIALS FOR A TERM OF 180 CALENDAR DAYS.	OP-386	AWARD	A.A. ASBESTOS ABATEMENT, CO., INC.	\$124,180.00
C-2.	07/08/19	DRY FIRE PROTECTION SPRINKLER SYSTEM REPLACEMENT AND WET PIPE FIRE PROTECTION SYSTEM ADDITION AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR REPLACEMENT OF THE DRY FIRE PROTECTION SPRINKLER SYSTEM AND ADDITION OF WET PIPE PROTECTION SYSTEM AT THE CHELSEA FACILITY FOR A TERM OF 170 CALENDAR DAYS.	OP-376	AWARD	FIRE EQUIPMENT, INC.	\$292,512.00
C-3.	07/18/19	ALEWIFE BROOK PUMP STATION REHABILITATION PERFORM TEST PITS TO LOCATE AND REPAIR SOURCE OF WATER LEAK; FURNISH AND INSTALL GALVANIZED RIGID CONDUIT AND WIRE FOR AN ADDITIONAL HORN AND STROBE FOR THE GAS DETECTION SYSTEM; FURNISH AND INSTALL TWO LEVEL INDICATORS AND TRANSMITTERS IN THE WET WELL; FURNISH AND INSTALL TWO CONCRETE FILLED STEEL BOLLARDS PAINTED SAFETY YELLOW.	6797	10	BARLETTA ENGINEERING CORP.	\$25,561.00
C-4.	07/18/19	COSGROVE INTAKE AND POWER STATION UPGRADES FURNISH AND INSTALL THERMAL BARRIER OVER SPRAY FOAM INSULATION IN AREAS WHERE ACOUSTICAL CEILING IS BEING INSTALLED; DEMOLISH EXISTING CEILING IN BATTERY ROOM AND FURNISH AND INSTALL NEW GYPSUM TYPE CEILING FOR THIS ROOM.	7022	2	GREENWOOD INDUSTRIES, INC.	\$34,917.98
C-5.	07/18/19	UPGRADE OF AIR-HANDLING SYSTEMS, JOHN J. CARROLL WATER TREATMENT PLANT AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR UPGRADE OF AIR-HANDLING UNIT SYSTEMS AT THE JOHN J. CARROLL WATER TREATMENT PLANT FOR A TERM OF 231 CALENDAR DAYS.	7605	AWARD	CAM HVAC & CONSTRUCTION, INC.	\$405,000.00
C-6.	07/25/19	DAM SAFETY COMPLIANCE AND CONSULTING SERVICES - REPAIRS, DESIGN AND ENGINEERING SERVICES DURING CONSTRUCTION INCREASE LEVEL OF EFFORT TO INCLUDE THE INITIAL RESPONSE TO THE SEEP DISCOVERY AT THE CHESTNUT HILL RESERVOIR DAM , SUBSURFACE INVESTIGATION, DESIGN OPTIONS FOR BLOW OFF PIPE SCREENING, PERMITS, EMBANKMENT SEEPAGE AREA REPAIRS AND CONSTRUCTION PHASE SERVICES TO SUPPORT MWRA METRO MAINTENANCE STAFF TO PERFORM SUCH REPAIRS.	7614	1	GZA GEOENVIRONMENTAL, INC.	\$49,013.00

CONSTRUCTION/PROFESSIONAL SERVICES DELEGATED AUTHORITY ITEMS AUGUST 1 - 31, 2019

NO.	DATE OF AWARD	TITLE AND EXPLANATION	CONTRACT	AMEND/CO	COMPANY	FINANCIAL IMPACT
C-1.	08/12/19	NORTHERN INTERMEDIATE HIGH SECTION 110 AND 112 - STONEHAM AND WAKEFIELD FINAL BALANCING CHANGE ORDER TO DECREASE THE FOLLOWING BID ITEMS TO REFLECT ACTUAL QUANTITIES USED: DELETE THE REQUIREMENT TO TEST, REMOVE, HANDLE, TRANSPORT AND DISPOSE OF GROUP 1B AND GROUP II EXCAVATED MATERIALS; FURNISH AND INSTALL RJ DI MWRA WATER PIPE AND THRUST BLOCK, PRESSURE TEST AND CHLORINATE 48 RJ DI MWRA WATER PIPE, FURNISH AND INSTALL COMPLETE NEW WATER SERVICES, FURNISH AND INSTALL 1" COPPER WATER LINE REPLACEMENT IN WATER TRENCH, FURNISH AND INSTALL 1" WATER SERVICE CONNECTIONS, REMOVE, HANDLE AND DISPOSE OF ROCK AND BOULDER, FURNISH AND INSTALL 8" CURED IN PLACE PIPE LINING, FURNISH AND INSTALL 12" CURED IN PLACE PIPE LINING, TOWN OF STONEHAM POLICE DETAIL ALLOWANCE, WORK BY UTILITY COMPANIES AND CO3 CALMING MEASURES INCLUDING TRAFFIC CONES, SPEED BUMPS, RADAR SIGN ALONG THE DETOUR ROUTE.	7478	16	ALBANESE D&S, INC.	(\$378,524.06)
C-2.	08/12/19	READING EXTENSION SEWER AND METROPOLITAN SEWER REHABILITATION (SECTIONS 73/74/75/46) FINAL BALANCING CHANGE ORDER TO DECREASE THE FOLLOWING BID ITEMS TO REFLECT ACTUAL QUANTITIES USED: ALLOWANCE FOR POLICE DETAIL SERVICES; ALLOWANCE FOR PRICE ADJUSTMENT.	7164	2	GREEN MOUNTAIN PIPELINE SERVICES, INC.	(\$93,021.00)
C-3.	08/12/19	INSTRUMENTATION SYSTEMS SERVICES FINAL BALANCING CHANGE ORDER TO DECREASE THE FOLLOWING BID ITEMS TO REFLECT ACTUAL QUANTITIES USED: SCHEDULED PROCESS INSTRUMENTATION SYSTEMS SERVICES, SCHEDULED INTERCEPTOR H2S MONITORING SYSTEM SERVICES, NON-EMERGENCY AND EMERGENCY ON-CALL SERVICES, ON-CALL DIAGNOSTICS AND REMEDIATION SERVICES FOR PROCESS INSTRUMENTATION SYSTEMS, REPLACEMENT PARTS AND RENTAL EQUIPMENT.	OP-330	2	APOLLO SAFETY, INC.	(\$76,706.66)
C-4.	08/12/19	OVERHEAD DOOR MAINTENANCE SERVICES VARIOUS MWRA FACILITIES AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR OVERHEAD DOOR MAINTENANCE SERVICES AT VARIOUS MWRA FACILITIES FOR A TERM OF 730 CALENDAR DAYS.	OP-389	AWARD	SAFEBWAY OVERHEAD CRANE SERVICE, INC.	\$86,978.00
C-5.	08/12/19	NORTHERN INTERMEDIATE HIGH SECTION 110 - STONEHAM INCREASE ALLOWANCE FOR PRICE ADJUSTMENTS FOR DIESEL FUEL AND LIQUID ASPHALT; MODIFICATIONS RELATED TO PIPELINE ON SOUTH STREET.	7067	8	ALBANESE D&S, INC.	\$118,908.00
C-6.	08/12/19	FIRE ALARM SYSTEM SERVICES, CENTRAL AND WESTERN MASSACHUSETTS AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR ALARM SYSTEM SERVICES FOR EQUIPMENT LOCATED IN CENTRAL AND WESTERN MASSACHUSETTS MWRA FACILITIES FOR A TERM OF 730 CALENDAR DAYS.	OP-396	AWARD	ENCORE HOLDINGS, LLC d/b/a ENCORE FIRE PROTECTION	\$224,680.00
C-7.	08/12/19	FIRE PROTECTION SPRINKLER SYSTEM SERVICE AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR FIRE PROTECTION SPRINKLER SYSTEM SERVICE FOR EQUIPMENT LOCATED AT EASTERN AND WESTERN MASSACHUSETTS MWRA FACILITIES FOR A TERM OF 730 CALENDAR DAYS.	OP-390	AWARD	J.C. CANNISTRARO, LLC	\$226,900.00
C-8.	08/12/19	WACHUSETT DAM LOWER GATEHOUSE INTERIM PIPE REPAIR AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR WACHUSETT DAM LOWER GATEHOUSE INTERIM PIPE REPAIR FOR A TERM OF 180 CALENDAR DAYS.	7379	AWARD	THIELSCH ENGINEERING, INC.	\$330,000.00
C-9.	08/22/19	BOILER AND WATER HEATER SERVICE AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR BOILER AND WATER HEATER SERVICE AT VARIOUS MWRA FACILITIES FOR A TERM OF 730 CALENDAR DAYS.	OP-394	AWARD	COOLING & HEATING SPECIALISTS, INC.	\$384,312.00


PURCHASING DELEGATED AUTHORITY ITEMS JULY 1 - 31, 2019

NO.	DATE OF AWARD	TITLE AND EXPLANATION	CONTRACT	AMENDMENT	COMPANY	FINANCIAL IMPACT
P-1	07/10/19	SUPPLY AND DELIVERY OF GRAVEL AMENDMENT NO. 1 TO PURCHASE ORDER FOR THE SUPPLY AND DELIVERY FOR GRAVEL TO THE CLINTON WASTEWATER TREATMENT PLANT LANDFILL DUE TO HIGHER THAN ANTICIPATED SLUDGE QUANTITIES.	WRA-4571		PLANET EARTH MATERIALS	\$46,722.50
P-2	07/15/19	PURCHASE FOR ALLEN BRADLEY PROGRAMMABLE CONTROLLER HARDWARE AND SOFTWARE AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR ALLEN BRADLEY PROGRAMMABLE CONTROLLER HARDWARE AND SOFTWARE AS PART OF SCADA IMPROVEMENT AT THE BOS019 CSO FACILITY AND FRAMINGHAM PUMP STATION.	WRA-4691		NORTHEAST ELECTRICAL DISTRIBUTORS, INC.	\$102,413.40
P-3	07/18/19	MAINTENANCE AND SUPPORT OF CISCO SMARTNET SWITCHES AWARD OF A ONE-YEAR PURCHASE ORDER UNDER STATE CONTRACT ITT50 TO THE LOWEST RESPONSIVE BIDDER FOR MAINTENANCE AND SUPPORT OF 125 CISCO SMARTNET SWITCHES.	WRA-4721Q		EPLUS TECHNOLOGY, INC.	\$64,773.01
P-4	07/18/19	PURCHASE OF SCADA SOFTWARE MAINTENANCE AWARD OF A SOLE SOURCE PURCHASE ORDER FOR ONE-YEAR OF SCADA SOFTWARE MAINTENANCE.			GE DIGITAL, LLC	\$175,096.44

PURCHASING DELEGATED AUTHORITY ITEMS AUGUST 1 - 31, 2019


NO.	DATE OF AWARD	TITLE AND EXPLANATION	CONTRACT	AMENDMENT	COMPANY	FINANCIAL IMPACT
P-1.	08/12/19	PURCHASE OF 100 LONGITUDINAL FLIGHTS AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR 100 LONGITUDINAL FLIGHTS FOR THE DEER ISLAND TREATMENT PLANT.	WRA-4699Q		EVOQUA WATER TECHNOLOGY, LLC	\$25,400.00
P-2	08/12/19	PURCHASE OF PREVENTATIVE AND CORRECTIVE MAINTENANCE FOR A SPECTRO XRF SPECTROMETER AWARD OF A THREE-YEAR PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER TO PROVIDE PREVENTATIVE MAINTENANCE FOR ONE SPECTRO XRF X-RAY FLUORESCENCE SPECTROMETER FOR THE DEPARTMENT OF LABORATORY SERVICES.	WRA-4718Q		THE REMI GROUP, LLC	\$26,589.60
P-3	08/12/19	MICROSOFT PREMIER SERVICES, WEB ACCESS AND TECHNICAL SUPPORT AWARD OF A ONE-YEAR PURCHASE ORDER UNDER STATE CONTRACT ITS58 TO THE LOWEST RESPONSIVE BIDDER FOR MICROSOFT PREMIER SERVICES, WEB ACCESS AND TECHNICAL SUPPORT.	WRA-4712Q		CDW-G LLC	\$69,785.10
P-4	08/12/19	PURCHASE OF THREE PRECAST CONCRETE SLAB ASSEMBLIES AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR THREE PRECAST CONCRETE SLAB ASSEMBLIES FOR SECTION 107 OF THE NORTH METROPOLITAN RELIEF SEWER TO REPLACE EXISTING STRUCTURES THAT ARE IN POOR CONDITION.	WRA-4696		SCITUATE CONCRETE PRODUCTS, CORP.	\$93,820.00
P-5	08/12/19	PURCHASE OF SIX MICROSOFT EXCHANGE SERVER LICENSES AND 1,410 EXCHANGE CLIENT ACCESS LICENSES AWARD OF A PURCHASE ORDER UNDER STATE CONTRACT ITS58 TO THE LOWEST RESPONSIVE BIDDER FOR SIX MICROSOFT EXCHANGE SERVER LICENSES AND 1,410 EXCHANGE CLIENT ACCESS LICENSES, SUPPORTED THROUGH 2025	WRA-4713Q		CDW-G LLC	\$109,841.76
P-6	08/12/19	PRETREATMENT INFORMATION MANAGEMENT SYSTEM APPLICATION DEVELOPMENT SERVICES AWARD OF A PURCHASE ORDER UNDER STATE CONTRACT ITS63 TO THE LOWEST RESPONSIVE BIDDER FOR THE TRAC PRETREATMENT INFORMATION MANAGEMENT SYSTEM APPLICATION DEVELOPMENT SERVICES.	WRA-4722Q		MOTION RECRUITMENT PARTNERS, LLC	\$133,630.00
P-7	08/12/19	PURCHASE OF PREVENTIVE AND CORRECTIVE MAINTENANCE FOR AGILENT INSTRUMENTS AWARD OF A THREE-YEAR PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER TO PROVIDE PREVENTIVE AND CORRECTIVE MAINTENANCE FOR TEN AGILENT INSTRUMENTS FOR THE DEPARTMENT OF LABORATORY SERVICES.	WRA-4717		FULL SPECTRUM ANALYTICS, INC.	\$137,577.60
P-8	08/12/19	PURCHASE OF ONE BULLDOZER AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR ONE REPLACEMENT BULLDOZER FOR THE CLINTON WASTEWATER TREATMENT PLANT LANDFILL.	WRA-4703		SOUTHWORTH-MILTON, INC.	\$283,900.00
P-9	08/12/19	SUPPLY AND DELIVERY OF 462,000 GALLONS OF ULTRA-LOW SULFUR #2 DIESEL FUEL AWARD OF A PURCHASE ORDER UNDER STATE CONTRACT ENE47 TO THE LOWEST RESPONSIVE BIDDER FOR THE SUPPLY AND DELIVERY OF 462,000 GALLONS OF ULTRA-LOW SULFUR #2 DIESEL FUEL FOR THE DEER ISLAND TREATMENT PLANT.	WRA-4732		GLOBAL MONTELLO GROUP CORPORATION	\$883,759.80

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: September 18, 2019
SUBJECT: Fiscal Year 2019 Year-End Capital Improvement Program Spending Report

COMMITTEE: Administration, Finance & Audit

 VOTE
 X INFORMATION

Michael J. Cole, Budget Director 

David W. Coppes
Chief Operating Officer 

James J. Coyne, Assistant Finance Manager 

Thomas J. Durkin
Director, Finance

Preparer/Title

At the end of each fiscal year, staff present the Board with a recap of the Capital Improvement Program (CIP).

FY19 was the first year of MWRA's five-year spending cap for FY19-23 established at \$984.8 million. The FY19 capital budget was \$178.9 million. The FY19 capital spending totaled \$142.9 million, \$36.0 million or 20.1% lower than budget.

In FY19, the Authority reached substantial completion on the Wachusett Aqueduct Pumping Station, Alewife Brook Pump Station, Northern Intermediate High Section 89 & 29 Redundancy Phase 1C Construction and Southern Extra High Redundancy Pipeline Section 111 Phase 1 projects.

The Authority made significant progress on several major projects at Deer Island, including the Winthrop Terminal Facility Variable Frequency Drives Replacements and Gravity Thickener Rehabilitation, Chelsea Creek Upgrades Construction, and the Northern Intermediate High and Southern Extra High Redundancy water pipeline projects.

In FY19, MWRA managed 94 design and construction contracts and awarded 29 new contracts valued at \$73.2 million.

RECOMMENDATION:

For information only. The Fiscal Year 2019 Year-End Capital Program Spending Report highlights MWRA's major capital program accomplishments during FY19 and provides explanations for spending variances. *Please see Attachment A for the full Report.*

DISCUSSION:

Projects that were completed or reached substantial completion in FY19 included:

- Wachusett Aqueduct Pumping Station - \$51.1 million
- Northern Intermediate High Service Section 89 & 29 Redundancy Phase 1C - \$18.3 million
- Alewife Brook Pumping Station Construction - \$13.5 million
- Southern Extra High Redundancy Pipeline Section 111 Phase 1 - \$12.6 million
- Marlborough Maintenance Facility - \$3.7 million
- Maximo Upgrade - \$2.6 million
- Interceptor Renewal 1 Reading Extension Sewer - \$1.9 million
- Demolition of Section 56 Water Main, General Edwards Bridge - \$1.9 million
- DeLauri Pump Station Screens & Security - \$1.3 million
- Residuals Sludge Tank and Silo Coating - \$0.8 million
- Carroll Water Treatment Plant Liquid Oxygen Storage Yard Canopy - \$0.4 million

MWRA made significant progress on a number of water and wastewater projects, including:

- Southern Extra High Redundancy Section 111 Phase 2 – 75% complete
- Bellevue 2 and Turkey Hill Water Tanks Painting – 77% complete
- Northern Intermediate High Sections 89 & 29 Redundancy Phase 2 – 76% complete
- Winthrop Terminal Facility Variable Frequency Drives Replacement – 55% complete
- Chelsea Headworks Upgrades – 53% complete
- Deer Island Gravity Thickener Rehabilitation – 28% complete

MWRA pipeline rehabilitated or constructed in FY19 totaled 0.3 miles for wastewater projects and over 4.0 miles for water projects. *Please see Attachment D for a detailed breakdown of the linear footage of pipeline rehabilitated or constructed by project for FY19.*

Major contracts awarded by MWRA in FY19 with the following Notice to Proceed dates include:

- Carroll Water Treatment Plant Technical Assistance 9 and 10 – July 2018
- Weston Aqueduct Supply Mains/Spot Pond Supply Mains Pressure Reducing Valves Design/Construction Administration – July 2018
- Bellevue 2 and Turkey Hill Tanks Painting – August 2018
- Southern Extra High Redundancy Section 111 Construction 3 – August 2018
- Clinton Roofing Rehabilitation – September 2018
- Remote Headworks and Deer Island Shaft Study – September 2018
- Deer Island Radio Repeater Upgrade 1 – October 2018
- Miscellaneous Fencing Installations and Repairs – October 2018
- Cosgrove Intake Roof Replacement – November 2018

- Braintree-Weymouth Improvements Design/Engineering Services During Construction – December 2018
- Cathodic Protection Shafts E & L – January 2019
- Intermediate High Pipeline Improvements Design/Engineering Services During Construction – January 2019
- Carroll Water Treatment Plant SCADA Upgrade Design Programming Resident Engineering – January 2019
- Carroll Water Treatment Plant Emergency Generator #1 Replacement – February 2019
- Commonwealth Avenue Pumping Station Improvements Construction – February 2019
- Deer Island Water Tank Painting – May 2019
- Sudbury/Foss Dam Design/Construction Administration/Resident Inspection – March 2019
- Residuals Electrical/Mechanical/Drum Dryer Replacements – April 2019
- Combined Heat and Power Alternatives Study – April 2019
- Metropolitan Tunnel Redundancy Program Support Services – April 2019
- Chestnut Hill Emergency Pumping Station Design/Engineering Services During Construction – May 2019
- Modeling of Massachusetts Bay Water Quality – May 2019
- Generator Docking Station – May 2019 and Resident Engineering/Inspection awarded in April 2019
- Combined Heat and Power Alternatives Study – June 2019
- Gillis Pumping Station/Cottage Farm CSO Roof Replacement – June 2019

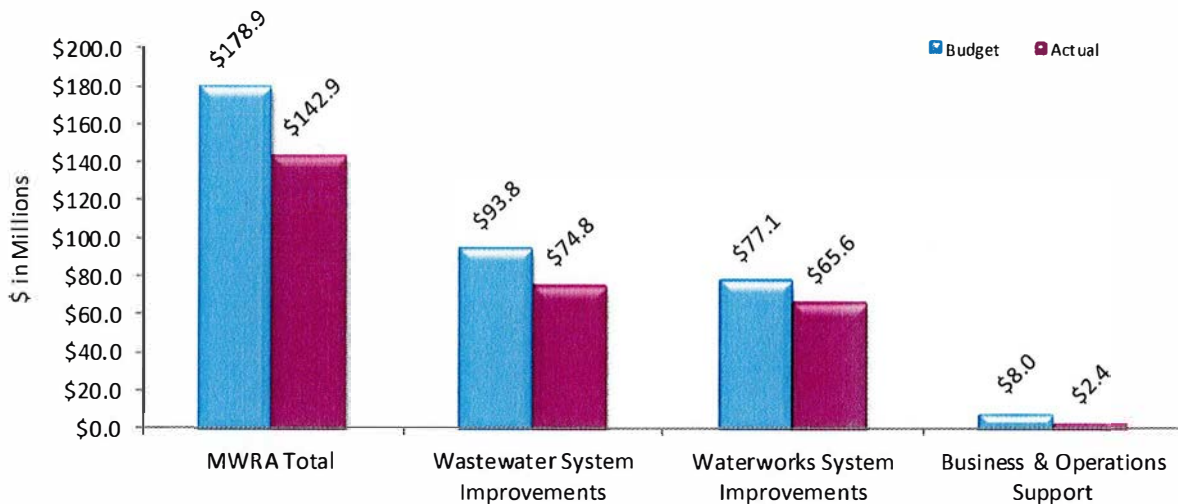
Please see Attachment C FY19 Planned versus Actual/Revised CIP Notices to Proceed for a complete list of contracts awarded.

FY19 also included overall spending of \$53.5 million for the community financial assistance programs on both the water and wastewater sides. Inflow and Infiltration (I/I) spending consisted of \$34.1 million in grants and \$12.2 million in loans offset by \$6.7 million in prior period loan repayments for net spending of \$39.6 million. The Local Water System Assistance Program spending was \$38.4 million in loans, including CVA communities, offset by \$24.6 million in prior period loan repayments for net spending of \$13.8 million that includes Lead Service Line Replacement loans of \$2.6 million.

Major Variances to FY19 Budget

For FY19, total Capital Improvement Program spending was budgeted at \$178.9 million. Total spending was \$142.9 million, which was \$36.0 million or 20.1% below budget. Underspending was reported in Wastewater of \$19.0 million, \$11.4 million in Waterworks Improvements, and \$5.6 million in Business and Operations Support.

**FY19 CIP Spending
Year-To-Date
June**



The table below reports the FY19 spending and variances by major program:

\$ in Millions	Budget	Actuals	\$ Var.	% Var.
Wastewater System Improvements				
Interception & Pumping	46.9	23.1	(23.8)	-50.7%
Treatment	21.9	10.0	(11.9)	-54.2%
Residuals	3.2	0.8	(2.3)	-73.8%
CSO	2.6	1.2	(1.4)	-54.0%
Other	19.2	39.6	20.4	106.4%
Total Wastewater System Improvements	\$93.8	\$74.8	(\$19.0)	-20.2%
Waterworks System Improvements				
Drinking Water Quality Improvements	1.7	0.8	(0.9)	-53.9%
Transmission	14.7	9.9	(4.8)	-32.6%
Distribution & Pumping	41.1	36.6	(4.5)	-10.9%
Other	19.6	18.4	(1.3)	-6.5%
Total Waterworks System Improvements	\$77.1	\$65.6	(\$11.4)	-14.8%
Business & Operations Support	\$8.0	\$2.4	(\$5.6)	-69.8%
Total MWRA	\$178.9	\$142.9	(\$36.0)	-20.1%

The \$36.0 million variance is the net of \$65.6 million in less than budgeted spending on 34 projects offset by \$29.6 million in more than budgeted spending on 13 projects. The main reasons for the variances were:

Interception & Pumping: Net underspending of \$23.8 million

- \$15.0 million for Chelsea Creek Headworks Upgrades construction due to delays for odor control equipment delivery, commissioning Channel 1, and the redesign of lower roofs.

- \$5.2 million for Nut Island Odor Control and HVAC Upgrades Construction and \$0.6 million for Design CA/REI due to a delay in completion of design documents.
- \$0.9 million for Dorchester Interceptor Sewer Construction and \$0.5 million for Prison Point CSO Upgrade Construction due to schedule shifts.
- \$0.7 million for Remote Headworks and Deer Island Shaft Study due to a delay in the notice to proceed.
- \$0.6 million for Wastewater Metering Planning/Study/Design is due to police details and temporary meter work that were less than anticipated.
- \$0.4 million for Wastewater Central Monitoring Design and Programming Services, and Equipment/Hardware due to timing of work and purchases.
- \$0.3 million for Siphon Structure Design due to updated schedule and re-scoping of project.
- \$0.3 million for Prison Point Rehabilitation Design CA/REI due to additional time needed for document review.
- This underspending was partially offset by \$0.4 million for Reading Extension Sewer and \$0.3 million for Prison Point Piping Rehabilitation for FY18 scheduled work that was completed in FY19, \$0.4 million for Alewife Brook Pump Station construction due to the timing of final work, and \$0.2 million for the DeLauri Pump Station Security and Screens due to work scheduled for FY18 performed in FY19.

Other Wastewater: Net overspending of \$20.4 million

- \$20.4 million for Community I/I due to greater than budgeted requests for grants and loans.

Wastewater Treatment: Net underspending of \$11.9 million

- \$5.3 million for Clarifier Rehabilitation Phase 2 Construction and REI due to an updated schedule.
- \$4.3 million for HVAC Equipment Replacement Construction and REI and \$1.5 million for Chemical Tanks and Digester Pipe Replacement due to schedule changes and projects being re-scoped.
- \$0.8 million for Clinton Roofing Rehabilitation due to a delay in the start of work.
- \$0.3 million for Radio Repeater System Upgrade 1 and \$0.3 million for Upgrade 2 due to delayed awards due to specifications change.
- \$0.3 million for Eastern Seawall Design/ESDC due to an updated schedule.
- This underspending was partially offset by overspending of \$1.8 million for Gravity Thickener Rehabilitation due to better than anticipated contractor progress, and \$0.2 million for Clinton Phosphorus Reduction Construction for work scheduled for FY18 that was performed in FY19.

Business & Operations Support: Net underspending of \$5.6 million

- \$2.6 million for the timing of MIS initiatives, \$1.6 million for As-Needed Technical Assistance and Resident Engineering and Inspection Services due to lower than projected task order work, \$0.4 million for Security Equipment & Installation due to delay in security initiatives, \$0.4 million for Vehicle Purchases and \$0.3 million for Lab Instrumentation due to timing of purchases.

Waterworks Transmission: Net underspending of \$4.8 million

- \$2.7 million for Maintenance Garage/Wash Bay/Storage Building due to a schedule delay.
- \$1.1 million for Chestnut Hill Emergency Pumping Design/CA due to a delay in award and was awarded less than budgeted.
- \$0.4 million for Commonwealth Avenue Pumping Station Design Construction Administration/Resident Inspection and \$0.6 million for construction due to a change in the construction notice to proceed.
- \$0.6 million for Tops of Shafts Design/CA/RI due to now using technical assistant contracts in lieu of design contract.
- \$0.6 million for Wachusett Aqueduct Pumping Station Design due to less than anticipated resident engineering services.
- \$0.5 million for Tunnel Redundancy Preliminary Design and Massachusetts Environmental Policy Act due to schedule change.
- \$0.4 million for WASM 3 MEPA/Design/CA/RI for test pit work that was delayed.
- This underspending was partially offset by overspending of \$1.2 million for timing of Watershed Land purchases \$0.4 million for Rosemary Brook Siphon Building Repair due to timing of final payment, and \$0.4 million for Wachusett Pumping Station Construction due to greater than anticipated contractor progress.

Water Distribution and Pumping: Net underspending of \$4.5 million

- Underspending of \$3.9 million for Southern Extra High Redundancy Construction 3 due to a delay in notice to proceed and an issue with MBTA crossing.
- \$0.7 million for Section 23, 24, 47 Final Design CA/RI due to a delayed gas line relocation.
- \$0.7 million for Peabody Pipeline Design/ESDC and \$1.6 million for Construction due to contract not moving forward.
- \$0.4 million for Sections 53 and 99 Replacement Design and \$0.2 million for Section 56 Replacement Saugus Design due to schedule changes.
- \$0.2 million for Section 14 Water Main Relocation (Malden) due to FY19 scheduled work that was completed in FY18.
- This underspending was partially offset by overspending of \$1.0 million for Southern Extra High (SEH) Section 111 Construction 2, \$0.2 million for Construction 1, \$0.9 million for Section 56 Pipe Demolition, \$0.7 million for Northern Intermediate High (NIH) Section 89 & 29 Phase 2, \$0.4 million for Phase 1C, \$0.1M for Phase 1B, and \$0.3 million for Cathodic Protection Shafts E & L due to better than anticipated contractor progress, \$0.2 million for NIH Section 89 & 29 Redundancy Design CA/RI and \$0.1 million for Section 50/57 Water and Sections 21/20/10 Sewer Design ESDC/REI due to the consultant's progress.

Residuals: Net underspending of \$2.3 million

- Underspending of \$1.9 million for Electrical and Mechanical Improvements due to a delay in award as a result of combining electrical and mechanical contracts and adding drum dryer replacements to scope of work, \$0.6 million for Pellet Conveyance Piping Relocation due to a schedule change, partially offset by \$0.1 million for Sludge Tank and Silo Coating due to work scheduled for FY18 completed in FY19.

Combined Sewer Overflow: Net underspending of \$1.4 million

- \$1.4 million for Somerville Marginal In-System Storage due to the delay of the design and construction awards by the City of Somerville.

Other Waterworks: Net underspending of \$1.3 million

- \$3.2 million for Deer Island Water Tank Painting due to a delay in the notice to proceed and the contract awarded less than budgeted, \$2.4 million for Bellevue 2 and Turkey Hill Painting/Improvements contract being awarded less than budgeted, additional structural repairs needed and antenna relocation delays, and \$0.4 million for a delay in the start of work for the Cosgrove Intake Roof Repair contract, \$0.4 million for the Generator Docking Station contract due to a delay in the award and long lead time for equipment, \$0.3 million for Gillis Pumping Station/Cottage Farm Roof Replacement and \$0.3 million for Steel Tank Improvements Design/CA due to updated schedules.
- This underspending was partially offset by \$5.5 million for the Local Water System Assistance Program due to greater than anticipated loan requests.

Drinking Water Quality Improvements: Net underspending of \$0.9 million

- \$0.6 million for timing of task order work and \$0.3 million primarily due to an updated schedule for Cosgrove Boat Storage work.

Please see Attachment B for detailed FY19 CIP variance explanations of all FY19 projects.

FY20 Outlook

Looking ahead to FY20, the projected capital spending is \$209.8 million including contingency of \$10.3 million. Projects with the largest budgeted spending in FY20 include Facility Asset Protection of \$37.4 million, Deer Island Treatment Plant Asset Protection of \$32.9 million Infiltration/Inflow Local Financial Assistance of \$25.7 million, Southern Extra High Redundancy and Storage of \$14.9 million, Metropolitan Redundancy Interim Improvements of \$10.4 million, and Local Water System Assistance Program of \$9.7 million.

Staff will be completing the design and progressing to the bid and award stage on several major projects such as Deer Island Treatment Plant (DITP) Clarifier Rehabilitation Phase 2 Construction, DITP HVAC Equipment Replacement Construction, Nut Island Odor Control HVAC Improvements Construction, Prison Point CSO Rehabilitation Construction, DITP Fire Alarm System Construction, Metropolitan Tunnel Redundancy Preliminary Design and Massachusetts Environmental Policy Act Review, New Connecting Mains Shaft 7 to WASM 3 CP3 Sections 23,24,47 Rehabilitation, Ward St & Columbus Park Headworks Design/Construction Administration, and DI Motor Control Center & Switchgear Replacement Construction.

Please see Attachment E for FY20 Planned Contract Awards.

ATTACHMENTS:

- A. Fiscal Year 2019 Year-End Capital Program Spending Report
- B. FY19 CIP Year-End Variance Report
- C. FY19 Planned versus Actual/Revised Contract Awards
- D. Linear Footage of Rehabilitated or New Pipelines in FY19
- E. FY20 Planned Capital Contract Awards

MASSACHUSETTS WATER RESOURCES AUTHORITY

Capital Program Spending Report

for

Fiscal Year 2019



September 18, 2019

Fiscal Year 2019 Year-End Capital Program Spending Report

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Introduction

Since its inception in 1986, MWRA has expended \$8.5 billion on capital initiatives. Of this spending 71% has supported improvements to Wastewater treatment, interception, pumping and combined sewer overflow (CSO) systems, 27% has supported Waterworks treatment, transmission, distribution and water protection improvements, and 2% has supported Business and Operations Support initiatives. Through FY19, nearly 80% of the capital spending has been for court mandated projects. The long-term strategy for capital work is identified in the Authority’s Master Plan which was first published in 2006, updated in 2013 and 2019, and serves as a road map for inclusion of projects in the Capital Improvement Program (CIP) in every budget cycle. Going forward, MWRA expects to spend \$2.7 billion on system improvements between FY19-FY29 with main emphasis on Asset Protection and Water System Redundancy initiatives including the Metropolitan Tunnels Long-Term Redundancy Project.

MWRA Capital Spending FY1986 - FY2029				
(in millions)				
	Expenditures FY86 - FY19		Planned Expenditures FY20 - FY29	
Program	Amount	% of Total	Amount	% of Total
Wastewater	\$5,988	71%	\$1,453	54%
Waterworks	\$2,345	27%	\$1,164	43%
Business & Operations Support	\$136	2%	\$61	2%
Total MWRA	\$8,469	100%	\$2,678	100%

To date, MWRA has spent \$911.3 million on the Wastewater CSO program and plans to spend an additional \$7.7 million through FY21.

To date, MWRA has distributed \$199.3 million in grants and \$201.2 million in no-interest loans to fund 574 separate projects in 43 communities under the I/I Local Financial Assistance Program. Additionally, \$423.1 million in Local Water Pipeline Assistance Program loans has been distributed to member communities.

FY19 Spending

Total CIP spending in FY19 was \$142.9 million which was \$36 million or 20.1% less than the \$178.9 million budgeted.

Spending by program in FY19 was:

Program	FY19 Budget (in millions)	FY19 Actuals (in millions)	Variance	% Variance
Wastewater	\$93.8	\$74.8	(\$19.0)	-20.2%
Waterworks	\$77.1	\$65.6	(\$11.4)	-14.8%
Business & Operations Support	\$8.0	\$2.4	(\$5.6)	-69.8%
Total	\$178.9	\$142.9	(\$36.0)	-20.1%

FY19 included spending of \$53.5 million not directly under MWRA’s control, most notably the Inflow and Infiltration (I/I) program and the Local Water Pipeline program. These programs are either loan or grant programs to support the MWRA’s member communities’ local water and sewer infrastructure. In FY19, MWRA expended \$50.6 million in water and I/I loans and \$34.1 million in I/I grants offset by \$31.3 million in prior period loan repayments for net spending of \$53.4 million. After accounting for programs which are not directly under MWRA’s control, the FY19 CIP underspending is \$61.9 million or 40.9%.

FY19 Capital Program Highlights

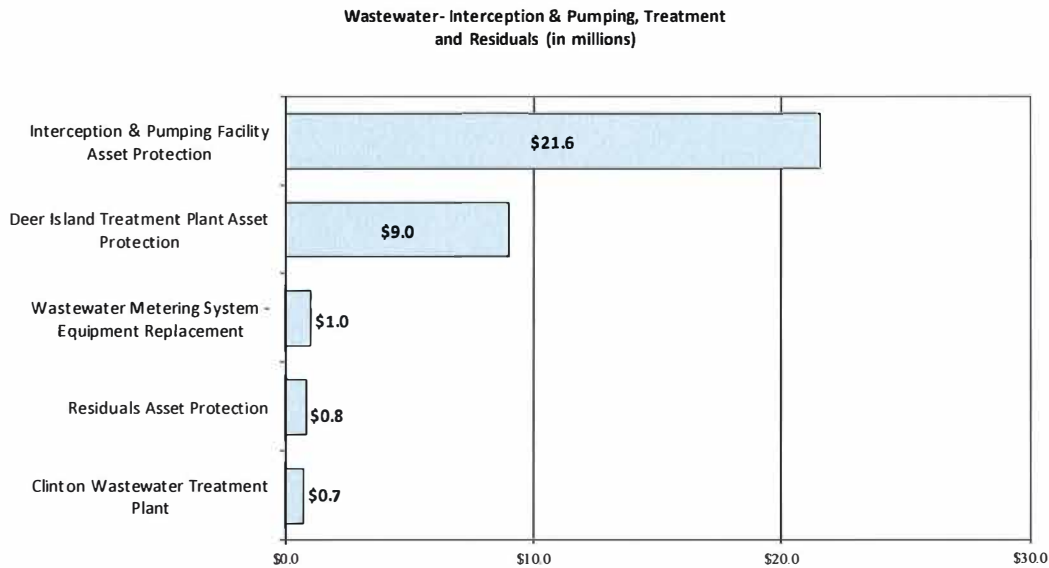
This section highlights the spending and key accomplishments by major program categories and projects.

Wastewater System

During FY19, the MWRA spent \$74.8 million on Wastewater system projects: \$23.1 million for Interception & Pumping projects, \$10.0 million for Treatment projects, \$0.8 million for Residuals, \$1.2 million for CSO projects, and \$39.7 million for Other Wastewater projects.

Wastewater Interception & Pumping, Treatment, and Residuals Projects

Total FY19 spending for Interception & Pumping was \$23.1 million, Treatment was \$10.0 million, and Residuals was \$0.8 million. The largest spending occurred on the following:



Key Accomplishments in Wastewater - Interception and Pumping:

- Remote Headworks & Deer Island Shaft Study
 - NTP issued in September 2018
- Braintree-Weymouth Pump Station Improvements Design/Engineering Services During Construction
 - NTP issued in December 2018
- Interceptor Renewal 1 Reading Extension Sewer Construction
 - Substantially complete in December 2018
- DeLauri Pump Station Screens and Security Upgrades
 - Substantially complete in February 2019
- Alewife Brook Pump Station Rehabilitation
 - Substantially complete in April 2019
- Modeling of Massachusetts Bay Water Quality
 - NTP issued in May 2019
- Chelsea Creek Headworks Upgrades Construction
 - Significant progress was made on project in FY19 – contract 53% complete.

Key Accomplishments in Wastewater – Treatment and Residuals:

- Residuals Sludge Tank and Silo Coating
 - Substantially complete in September 2018
- Clinton Roofing Rehabilitation
 - NTP issued in September 2018
- Deer Island Treatment Plant Radio Repeater System Upgrade 1
 - NTP issued in October 2018
- Residuals Electrical/Mechanical/Drum Dryer Replacements
 - NTP was issued in April 2019
- Combined Heat and Power Alternatives Study
 - NTP issued in June 2019
- Chemical Tank Relining and Pipe Replacement
 - Awarded in June 2019
- Gravity Thickener Rehabilitation
 - Significant progress was made on project in FY19 – contract 28% complete
- DITP Winthrop Terminal Facility Variable Frequency Drives Replacement Construction
 - Significant progress was made on project in FY19 – contract 55% complete

Wastewater System – Combined Sewer Overflow (CSO) Projects

Total FY19 spending for CSO projects was \$1.2 million which was primarily for the CSO Performance Assessment which began in November 2017.

Key Accomplishments in CSO:

- All CSO sewer separation reached substantial completion in FY16 in compliance with Schedule Seven of the Federal Court’s Orders in the 1985 Clean Water Act enforcement action. MWRA is currently required to submit bi-annual compliance and progress reports through December 2020. In addition, the CSO Performance Assessment commenced in November 2017. The Somerville Marginal In-System Storage agreement was approved in August 2018.

Wastewater - Other

In FY19, this category includes spending only for the community managed Infiltration/Inflow (I/I) Local Financial Assistance Program.

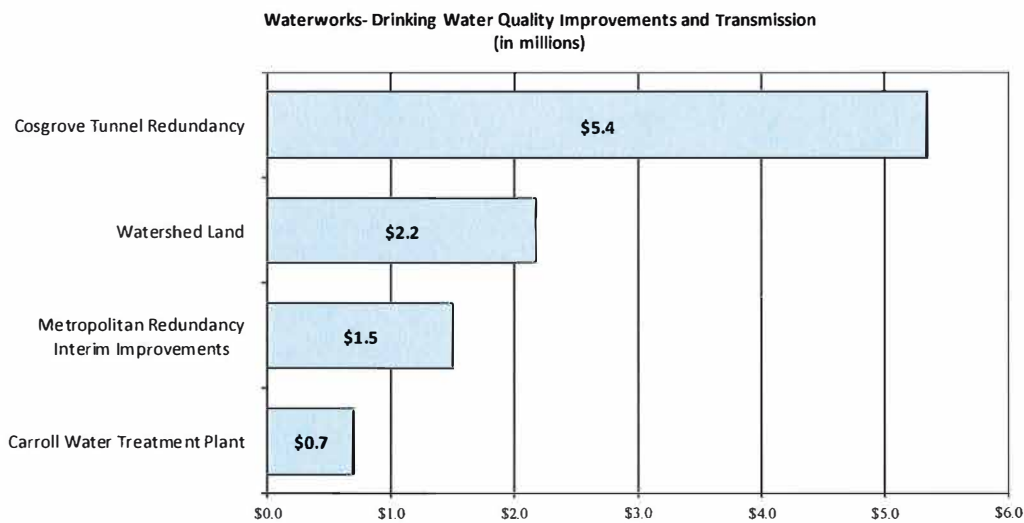
In FY19, MWRA distributed \$34.1 million in grants and \$12.2 million in no-interest loans which is offset by repayment of prior-period loans of \$6.7 million resulting in net spending of \$39.6 million.

Waterworks System

During FY19, the MWRA spent \$65.6 million on Waterworks system projects: \$0.8 million for Drinking Water Quality Improvement projects, \$9.9 million for Transmission projects, \$36.6 million for Distribution and Pumping projects, and \$18.3 million for Other Waterworks projects.

Waterworks System – Drinking Water Quality Improvements and Transmission

Total FY19 spending for Drinking Water Quality Improvements and Transmission projects was \$0.8 million and \$9.9 million, respectively. Projects with the largest spending are listed below:



Key Accomplishments in Drinking Water Quality Improvements:

- Marlborough Maintenance Facility
 - Substantially complete in July 2018
- Carroll Water Treatment Plant Technical Assistance 9 and 10
 - NTPs issued July 2018
- Carroll Water Treatment Plant Liquid Oxygen Storage Yard Canopy
 - Substantially complete in December 2018

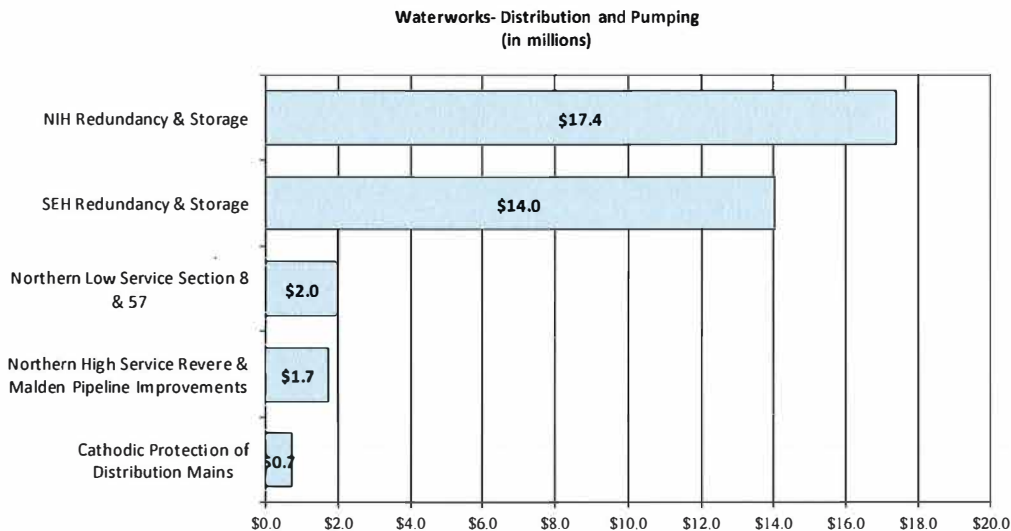
- Carroll Water Treatment Plant Emergency Generator #1 Replacement
 - NTP issued in February 2019

Key Accomplishments in Transmission:

- Weston Aqueduct Supply Mains/Spot Pond Supply Mains Pressure Reducing Valves Design/Construction Administration/Resident Inspection
 - NTP issued July 2018
- Wachusett Aqueduct Pumping Station Construction
 - Substantially complete in February 2019
- Commonwealth Avenue Pumping Station Improvements Construction
 - NTP issued in February 2019
- Sudbury/Foss Dam Design/Construction Administration/Resident Inspection
 - NTP issued in March 2019
- Metropolitan Tunnel Redundancy Program Support Services
 - NTP issued in April 2019
- Chestnut Hill Emergency Pumping Station Design/Engineering Services During Construction
 - NTP issued in May 2019

Waterworks System - Distribution and Pumping

Total FY19 spending for Distribution and Pumping projects totaled \$36.6 million. Projects with the largest spending are listed below:



Key Accomplishments in Distribution and Pumping:

- Southern Extra High Redundancy Section 111 Construction 3
 - NTP issued August 2018
- Northern Intermediate High Section 89 & 29 Redundancy – Phase 1C Construction
 - Substantially complete in September 2018
- Southern Extra High Redundancy Section 111 Construction 1
 - Substantially complete in September 2018
- Cathodic Protection Shafts E & L
 - NTP issued in January 2019
- Intermediate High Pipeline Improvements Design/Engineering Services During Construction
 - NTP issued in January 2019
- Demolition of Section 56 Water Main, General Edwards Bridge
 - NTP issued October 2018 and substantially complete in May 2019
- Northern Intermediate High Section 89 & 29 Redundancy – Phase 2 Construction
 - Significant progress was made on project in FY19 – contract 76% complete.
- Southern Extra High Redundancy – Section 111 Phase 2 Construction
 - Significant progress was made on project in FY19 – contract 75% complete.
- Southern Extra High Redundancy – Section 111 Phase 3 Construction
 - Significant progress was made on project in FY19 – contract 19% complete.

Waterworks – Other

Total FY19 spending for Waterworks Other totaled \$18.4 million.

This category includes the community assistance program for the local water pipelines and other MWRA Waterworks projects.

In FY19, MWRA distributed \$38.4 million in Local Water Pipeline Assistance Program loans to member communities offset by repayment of prior-period loans of \$24.6 million which resulted in total net receipts of \$13.8 million.

- Paint Bellevue 2 and Turkey Hill Tanks Painting
 - NTP issued in August 2018
- Cosgrove Intake and Power Station Upgrades
 - NTP issued in November 2018

- Carroll Water Treatment Plant SCADA Upgrade Design Programming Resident Engineering
 - NTP issued in January 2019
- Paint Deer Island Water Tank
 - NTP issued in March 2019
- Generator Docking Station
 - NTP issued in April 2019
- Generator Docking Station Resident Engineering/Inspection
 - Contract awarded in April 2019
- Gillis Pumping Station/Cottage Farm CSO Roof Replacement
 - NTP issued in June 2019

Business & Operations Support

Total FY19 spending for Business and Operations Support totaled \$2.4 million.

Key Accomplishments in Business & Operations Support:

- Miscellaneous Fencing and Gates
 - Substantially complete in September 2018
- As-Needed Construction Services/Resident Engineering/Inspection Contracts 1 and 2
 - NTP issued in September 2018
- Miscellaneous Fencing and Gates
 - NTP issued in October 2018
- As-Needed Design Contracts 14 and 15
 - Substantially complete in December 2018
- Maximo Upgrade
 - Substantially complete in December 2018
- Application Improvements Program Water Quality Reporting System Technical Consulting Services
 - NTP issued in January 2019
- Applications Improvements Program SAP Business Objects Environment
 - NTP issued in March 2019

Total New or Rehabilitated Pipeline

In addition to measuring spending on CIP projects, MWRA tracks the mileage of pipeline that is rehabilitated or added to its infrastructure. During FY19, the MWRA rehabilitated or constructed 0.3 miles of wastewater pipeline and 4.0 miles of water pipeline. These numbers do not include the rehabilitated or replaced pipelines of our member communities which are funded through our Inflow/Infiltration (I/I) and Water Loan programs as referenced above. *Refer to Attachment D for the specific linear footage of rehabilitated or new pipelines by project in FY19.*

FY19 Spending Variances

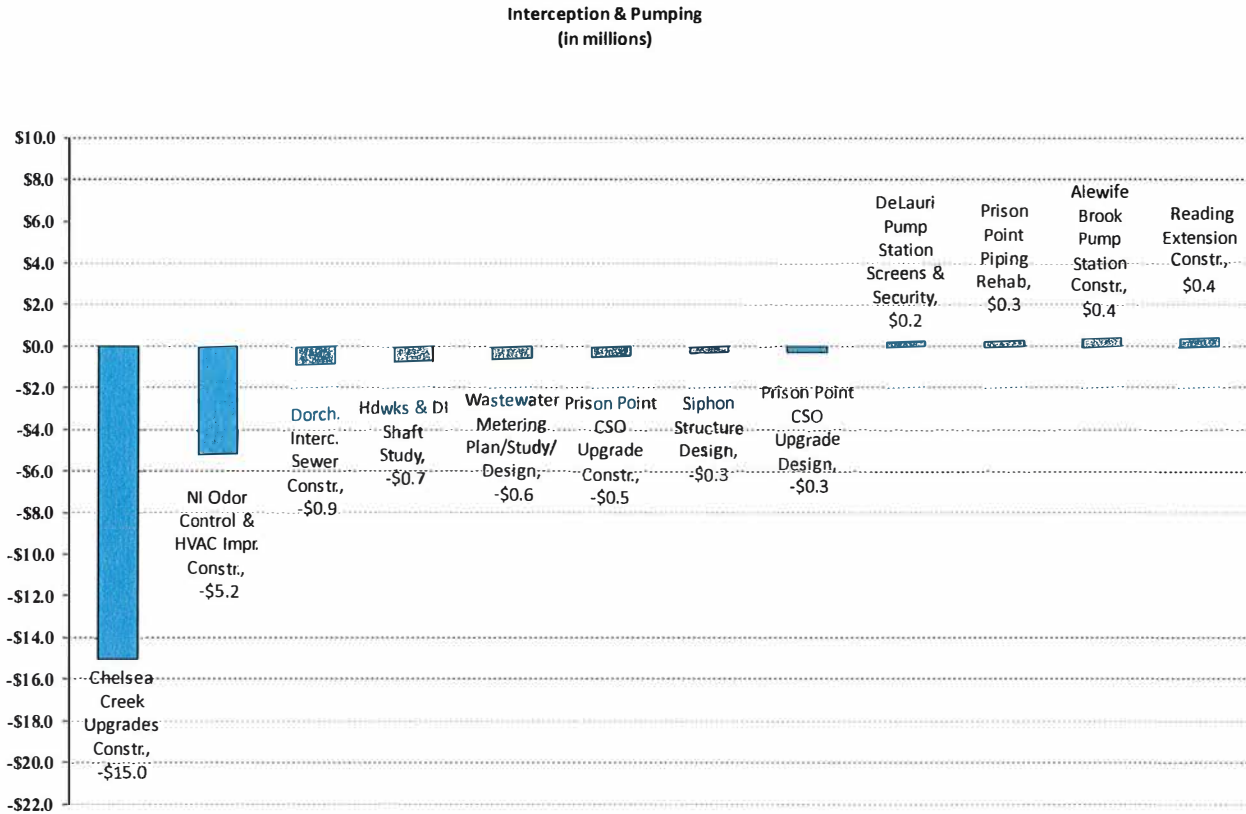
Total FY19 capital spending was \$142.9 million which was \$36 million or 20.1% less than the \$178.9 million budget. The variance is primarily due to underspending for the Interception & Pumping Facility Asset Protection, Deer Island Treatment Plant Asset Protection, Waterworks Facility Asset Protection, Corrosion & Odor Control, Metropolitan Redundancy Interim Improvements, Southern Extra High Redundancy, Watershed Division Capital Improvements, Residuals Asset Protection, Residuals Asset Protection, partially offset by greater community requests for loans and grants for the Infiltration/Inflow (I/I) Local Financial Assistance Program and greater than anticipated loans for the Local Water System Assistance Program.

Program	Budgeted Spending	Actual Spending	Variance to Budget		% Actual Spending to Total Spending
			\$	%	
Total Wastewater System	\$93,803	\$74,850	(\$18,953)	-20.2%	52%
Interception & Pumping	\$46,925	\$23,147	(\$23,778)	-50.7%	16%
Treatment	\$21,895	\$10,024	(\$11,870)	-54.2%	7%
Residuals	\$3,179	\$833	(\$2,345)	0.0%	1%
Combined Sewer Overflow	\$2,598	\$1,196	(\$1,402)	-54.0%	1%
Other Wastewater Programs	\$19,206	\$39,649	\$20,443	106.4%	28%
Total Waterworks System	\$77,085	\$65,647	(\$11,438)	-14.8%	46%
Drinking Water Quality Improvement	\$1,669	\$770	(\$899)	-53.9%	1%
Transmission	\$14,712	\$9,914	(\$4,798)	-32.6%	7%
Distribution and Pumping	\$41,074	\$36,603	(\$4,471)	-10.9%	26%
Other Waterworks Programs	\$19,630	\$18,359	(\$1,270)	-6.5%	13%
Business & Operations Support	\$7,968	\$2,408	(\$5,560)	-69.8%	2%
Total MWRA	\$178,856	\$142,904	(\$35,951)	-20.1%	100%

FY19 Variances for Major Projects

Please see Attachment B for the full FY19 CIP variance explanations by project.

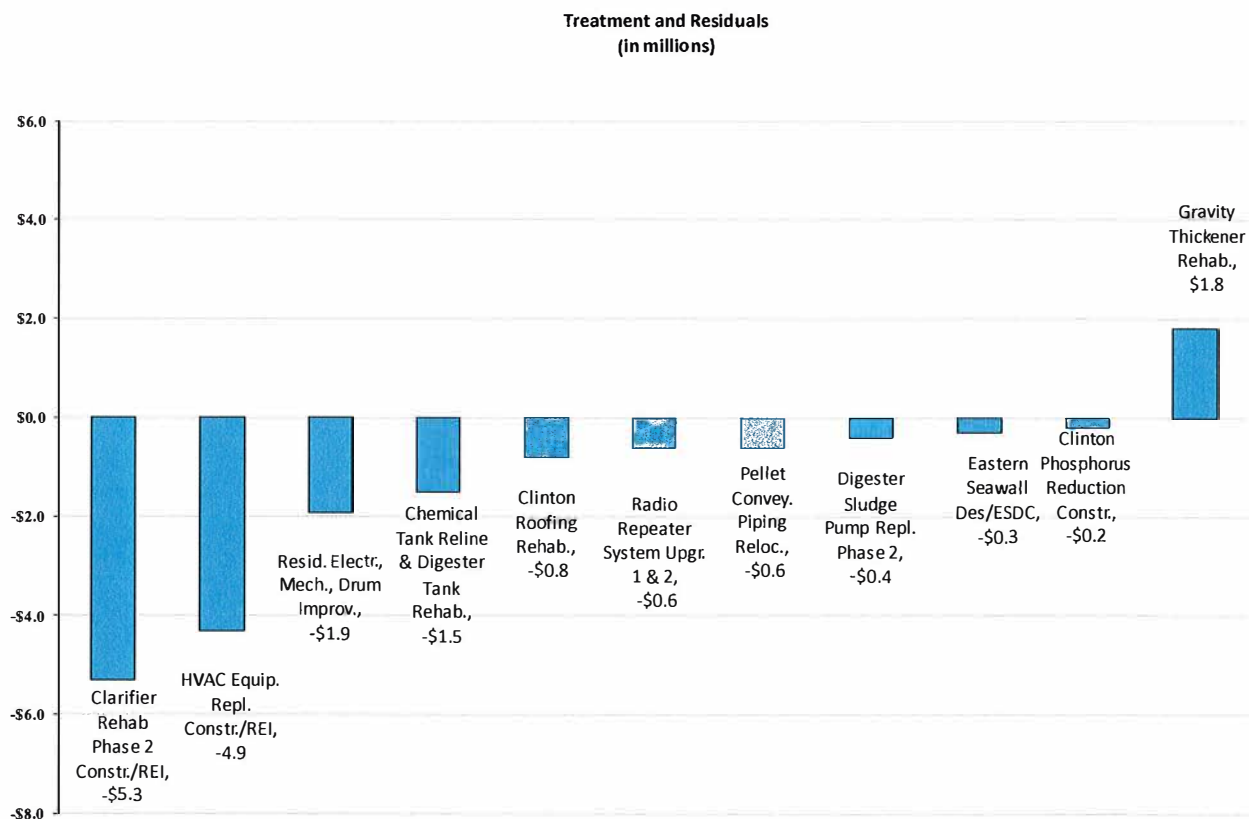
Wastewater - Interception & Pumping



- Total FY19 Budget: \$46.9 million
- Total FY19 Expended: \$23.1 million
- \$23.8 million less than budgeted spending
 - Underspending in Interception & Pumping Facility Asset Protection totaling \$16.4 million, including
 - \$15.0 million for Chelsea Creek Upgrades – Construction: delays in Channel 1 work, odor control equipment delivery, and redesign of lower roofs
 - \$5.2 million for Nut Island Odor Control and HVAC Upgrades Construction and \$0.6 million for Design CA/REI: delay in completion of design documents
 - \$0.9 million for Dorchester Interceptor Sewer Construction and \$0.5 million for Prison Point CSO Upgrade Construction: updated schedules

- \$0.7 million for Remote Headworks and Deer Island Shaft Study: delay in the notice to proceed
- \$0.6 million for Wastewater Metering Planning/Study/Design: police details and temporary meter work that were less than anticipated
- \$0.3 million for Siphon Structure Design: updated schedule and re-scoping of project
- \$0.3 million for Prison Point Rehabilitation Design CA/REI and \$0.5 million for Construction: updated schedules due to additional time needed for document review
- This underspending was partially offset by \$0.4 million for Reading Extension Sewer and \$0.3 million for Prison Point Piping Rehabilitation for FY18 scheduled work that was completed in FY19, \$0.4 million for Alewife Brook Pump Station construction due to the timing of final work, and \$0.2 million for the DeLauri Pump Station Security and Screens due to work scheduled for FY18 performed in FY19.

Wastewater – Treatment



Deer Island Treatment Plant Asset Protection:

- Total FY19 Budget: \$20.1 million
- Total FY19 Expended: \$9.0 million

- \$11.1 million less than budgeted spending
 - Underspending on projects totaling \$9.1 million, including
 - \$5.3 million for Clarifier Rehabilitation Phase 2 Construction and REI: Updated schedules
 - \$4.3 million for HVAC Equipment Replacement Design, Construction and REI and \$1.5 million for Chemical Tank Reline and Digester Tank Rehabilitation: Updated schedule and projects re-scoped
 - \$0.3 million for Eastern Seawall Design/Engineering Services During Construction: updated schedule
 - \$0.3 million for Radio Repeater System Upgrade 1 and \$0.3 million for Radio Repeater System Upgrade 2: delayed awards and specifications changed
 - Offset by overspending totaling \$2.1 million, including:
 - \$1.8 million for Gravity Thickener Rehabilitation: better than anticipated contractor progress

Clinton Wastewater Treatment Plant:

- Total FY19 Budget: \$1.7 million
- Total FY19 Expended: \$0.8 million
- Less than budgeted spending primarily due to delay in the start of work for the Clinton Roofing Rehabilitation contract of \$0.8 million partially offset by \$0.2 million on the Clinton Phosphorus Reduction contract due to work scheduled for FY18 that was performed in FY19.

Residuals Asset Protection:

- Total FY19 Budget: \$3.2 million
- Total FY19 Expended: \$0.4 million
- Less than budgeted spending primarily of \$1.9 million for Electrical and Mechanical Improvements due to a delay in award as a result of combining electrical and mechanical contracts and adding drum dryer replacements to scope of work, \$0.6 million for Pellet Conveyance Piping Relocation due to a schedule change, partially offset by \$0.1 million for Sludge Tank and Silo Coating due to work scheduled for FY18 completed in FY19.

Wastewater - Combined Sewer Overflows (CSO's)

- Total FY19 Budget: \$2.6 million
- Total FY19 Expended: \$1.2 million
 - \$1.4 million for Somerville Marginal In-System Storage due to the delay of the design and construction awards by the City of Somerville.

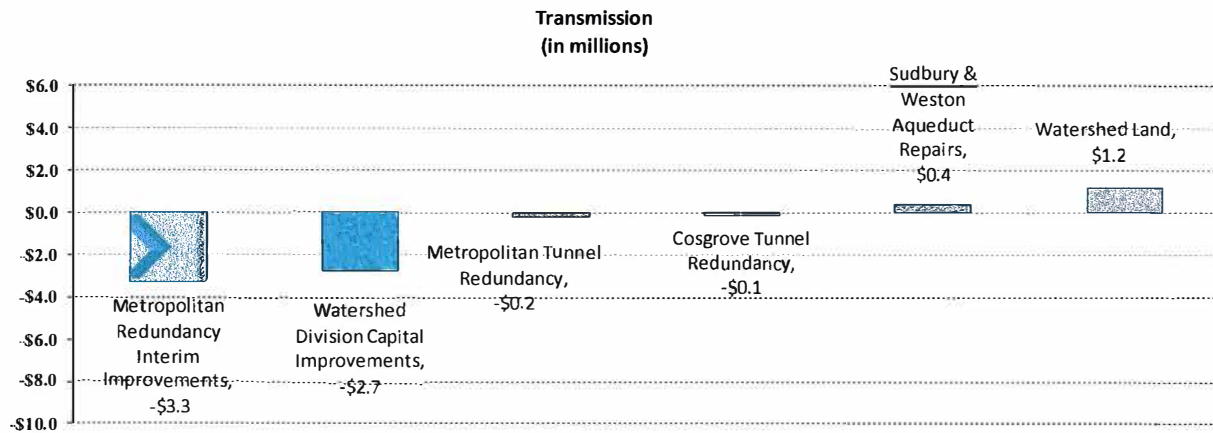
Wastewater - Other

\$20.4 million greater than budgeted spending for I/I Local Financial Assistance resulting from \$15.2 million in greater than budgeted grant distributions and \$5.1 million in greater than budgeted no-interest loans and \$0.1 million for repayments for previous loan distributions.

Waterworks - Drinking Water Quality Improvements

- Total FY19 Budget: \$1.7 million
- Total FY19 Expended: \$0.8 million
- \$0.9 million less than budgeted spending
 - Underspending primarily due to \$0.6 million for timing of As-Needed technical assistance work and \$0.3 million for Carroll Water Treatment Plant - Existing Facilities Upgrades CP-7 Boat Storage work due to updated schedule.

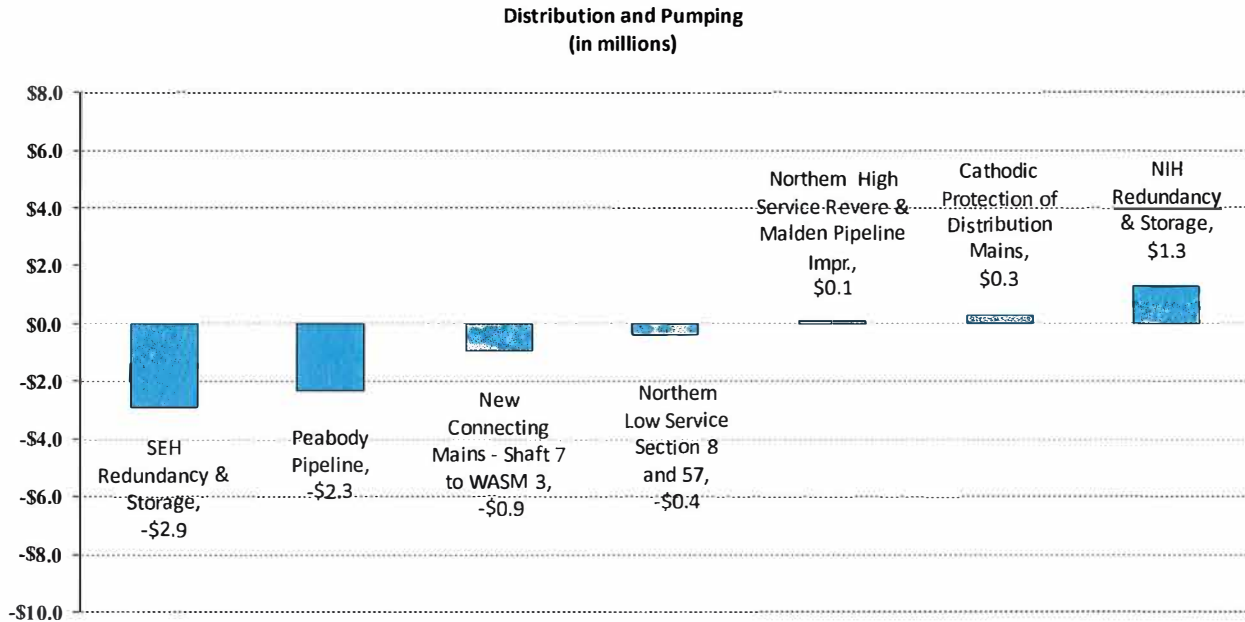
Waterworks – Transmission



- Total FY19 Budget: \$14.7 million
- Total FY19 Expended: \$9.9 million
- \$4.8 million less than budgeted spending
 - Underspending on projects of \$6.4 million, including
 - \$2.7 million for Maintenance Garage/Wash Bay/Storage Building: schedule delay
 - \$1.1 million for Chestnut Hill Emergency Pumping Design/CA: delay in award and was awarded less than budgeted
 - \$0.4 million for Commonwealth Avenue Pumping Station Design Construction Administration/Resident Inspection and \$0.6 million for construction due to a change in the construction notice to proceed
 - \$0.6 million for Tops of Shafts Design/CA/RI: now using technical assistant contracts in lieu of design contract
 - \$0.6 million for Wachusett Aqueduct Pumping Station Design: less than anticipated resident engineering services
 - \$0.5 million for Tunnel Redundancy Preliminary Design and Massachusetts Environmental Policy Act: updated schedule
 - \$0.4 million for WASM 3 MEPA/Design/CA/RI: test pit work that was delayed

- This underspending was partially offset by overspending of \$1.2 million for timing of Watershed Land purchases \$0.4 million for Rosemary Brook Siphon Building Repair due to timing of final payment, and \$0.4 million for Wachusett Pumping Station Construction due to greater than anticipated contractor progress.

Waterworks - Distribution and Pumping



- Total FY19 Budget: \$41.1 million
- Total FY19 Expended: \$36.6 million
- \$4.5 million less than budgeted spending
 - Underspending on various projects, including
 - \$3.9 million for Southern Extra High (SEH) Redundancy & Storage Section 111 Phase 3: delay in notice to proceed and an issue with MBTA crossing permit issues
 - \$0.7 million for Section 23, 24, 47 Final Design CA/RI: delayed gas line relocation
 - \$0.7 million for Peabody Pipeline Design/ESDC and \$1.6 million for Construction: contract not moving forward.
 - \$0.4 million for Sections 53 and 99 Replacement Design and \$0.2 million for Section 56 Replacement Saugus Design: updated schedules
 - \$0.2 million for Section 14 Water Main Relocation (Malden): FY19 scheduled work that was completed in FY18
 - Offset by overspending on various projects, including: \$1.0 million for Southern Extra High (SEH) Section 111 Construction 2, \$0.2 million for Construction 1, \$0.9 million for Section 56 Pipe Demolition, \$0.7 million for Northern Intermediate High (NIH) Section 89 & 29 Phase 2, \$0.4 million for Phase 1C, \$0.1M for Phase 1B, and \$0.3 million for Cathodic Protection Shafts E & L due to better than anticipated contractor progress,

\$0.2 million for NIH Section 89 & 29 Redundancy Design CA/RI and \$0.1 million for Section 50/57 Water and Sections 21/20/10 Sewer Design ESDC/REI due to the consultant's progress.

Waterworks - Other

- Total FY19 Budget: \$19.6 million
- Total FY19 Expended: \$18.4 million
- \$1.3 million less than budgeted spending
 - Deer Island Water Tank Painting: \$3.2 million due to a delay in the notice to proceed and the contract awarded less than budgeted
 - Bellevue 2 and Turkey Hill Painting/Improvements: \$2.4 million due to contract being awarded less than budgeted, additional structural repairs needed and antenna relocation delays
 - Cosgrove Intake Roof Repair: \$0.4 million due to updated schedule and delay in start of work
 - Generator Docking Station: \$0.4 million due to a delay in award and long lead time for equipment
 - Gillis Pumping Station/Cottage Farm Roof Replacement: \$0.3 million and Steel Tank Improvements Design/CA: \$0.3 million due to updated schedules
 - This underspending was partially offset by Local Water Pipeline Improvement Loan Program: \$5.5 million due to greater than budgeted requests for community loans.

Business & Operations Support

- Total FY19 Budget: \$8.0 million
- Total FY19 Expended: \$2.4 million
- \$5.6 million less than budgeted spending
 - Management Information Systems (combined): \$2.6 million for MIS Projects: timing of the MIS initiatives
 - Capital Maintenance Planning/Development: \$1.6 million less than budgeted spending primarily due to lower than projected task order work for As-Needed Design and Resident Engineering/Inspection work
 - Centralized Equipment Purchase: \$1.1 million less than budgeted spending primarily due to delay in award of security equipment contracts and vehicle purchases

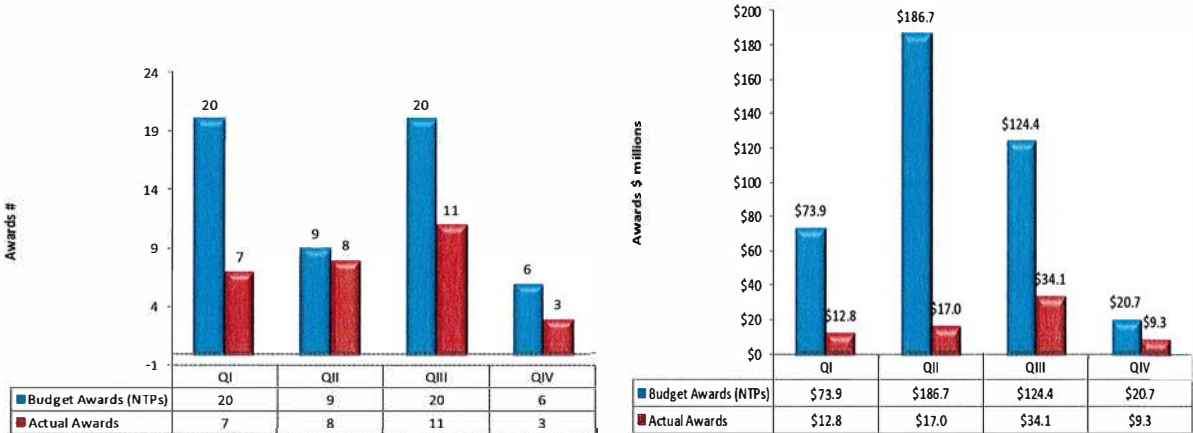
FY19 CIP Contract Awards

The FY19 CIP planned the award of 55 contracts with a value of \$405.7 million. During FY19, the MWRA awarded 29 contracts valued at \$73.2 million, representing 52.7% of contracts and 18% of contract funding. Of the 55 planned awards, 18 contracts were awarded, 30 are expected to be awarded in FY20, 2 have been rescheduled beyond FY20, and 5 are being done in-house, were deleted, or scope moved to another contract. Of the 30 contracts that moved to FY20: 4 were due

to permitting issues, 15 due to scope changes, 3 due to changes in priorities, and 8 due to bidder issues/outside consultant/contractor delays/additional specification review. In addition to FY19 budgeted awards, 11 contracts were awarded: 3 projects slipped from FY18, 6 contracts for work that was broken out from an existing phase of a project, and 2 for new contracts, bringing the total number of contracts awarded in FY19 to 29.

A comparison of the FY19 budgeted contracts and the FY19 actual contract awards are detailed below:

FY19 Contracts (\$ in Millions)				
Program	Budget		Actual	
	#	\$	#	\$
Total MWRA	55	405.7	29	73.2
Wastewater	27	309.8	8	23.3
Waterworks	22	88.6	16	45.9
Business Operations & Support	6	7.3	5	4.0



Please refer to Attachment C for a full listing of contracts planned to be awarded in FY19 and actual awards.

Change Orders Review

Management of change orders remains a top priority. Total change orders for MWRA-managed active capital projects were 6.6% of award value through June 2019. This percentage is within the target of 10% for change orders as a percentage of awards.

Master Plan and the FY19 CIP Process

To arrive at the FY19 Final CIP, the Authority identified the needs of the programs taking into account the recommendations of the Master Plan. The long-term strategy for capital work is identified in the Authority's Master Plan which was published in 2006 and updated in 2013 and 2019. The Master Plan serves as a road map for inclusion of projects in the CIP in every budget cycle. In FY19, seventeen new projects were added from the Master Plan.

The updated Master Plans will be focused on capital needs over the next 40-years and are intended to be the principal framework for annual capital planning. The Plans will focus on projects that require capital spending during the next two 5-year CIP cap cycles: FY19-23 and FY24-28. Potential capital needs during the next 10-year (FY29-38) and 20-year (FY39-53) planning periods will also be identified.

FY19-23 Spending Cap

MWRA spending during the FY19-23 timeframe is planned to be \$984.8 million, with additional net spending of \$123.2 million for the community I/I (Infiltration and Inflow) loan and grant program and \$32.4 million for the community water pipeline loan program. Annual cash flows for the Cap period are shown below in millions:

FY19 Final		FY19	FY20	FY21	FY22	FY23	Total FY19-23
	Projected Expenditures	\$179.2	\$276.1	\$251.3	\$194.9	\$150.4	\$1,051.8
I/I Program	(19.2)	(25.7)	(24.3)	(27.9)	(26.1)	(123.2)	
Water Loan Program	(8.3)	(8.4)	(7.2)	(5.6)	(2.8)	(32.4)	
MWRA Spending	151.7	241.9	219.7	161.4	121.4	\$896.2	
Contingency	9.9	15.9	14.5	11.0	8.2	59.4	
Inflation on Unawarded Construction	0.7	5.0	7.8	7.2	8.5	29.3	
Chicopee Valley Aqueduct Projects	(0.0)	0.0	0.0	0.0	0.0	(0.0)	
FY19 Proposed FY19-23 Spending	\$162.3	\$262.8	\$242.0	\$179.6	\$138.1	\$984.8	

The format of the Cap table has changed from prior cap periods to account separately for MWRA spending, which excludes the local I/I grant and loan program and the local water pipeline loan spending which are both outside of MWRA's control. As in past Caps, contingency for each fiscal year is incorporated into the CIP to fund the uncertainties inherent to construction. The contingency budget is calculated as a percentage of budgeted expenditure outlays. Specifically, contingency is 7% for non-tunnel projects and 15% for tunnel projects. Inflation is added for unawarded construction contracts. Finally, the Cap excludes Chicopee Valley Aqueduct system projects.

FY20 Outlook Based on FY20 CIP

Looking ahead to FY20, the projected capital spending is \$209.8 million including contingency of \$10.3 million. Projects with the largest budgeted spending in FY20 include Facility Asset Protection of \$37.4 million, Deer Island Treatment Plant Asset Protection of \$32.9 million Infiltration/Inflow Local Financial Assistance of \$25.7 million, Southern Extra High Redundancy

and Storage of \$14.9 million, Metropolitan Redundancy Interim Improvements of \$10.4 million, and Local Water System Assistance Program of \$9.7 million.

In FY20, 63 contracts or phases of projects with a total budget of \$437.0 million are expected to be awarded. Staff will be completing the design and progressing to the bid and award stage on several major projects such as Deer Island Treatment Plant (DITP) Clarifier Rehabilitation Phase 2 Construction, DITP HVAC Equipment Replacement Construction, Nut Island Odor Control HVAC Improvements Construction, Prison Point CSO Rehabilitation Construction, DITP Fire Alarm System Construction, Metropolitan Tunnel Redundancy Preliminary Design and Massachusetts Environmental Policy Act Review, New Connecting Mains Shaft 7 to WASM 3 CP3 Sections 23,24,47 Rehabilitation, Ward St & Columbus Park Headworks Design/Construction Administration, and DI Motor Control Center & Switchgear Replacement Construction. *Please see Attachment E for FY20 Planned Contract Awards.*

**ATTACHMENT B
FY19 CIP Year-to-Date Variance Report (\$000's)**

	FY19 Budget YTD June	FY19 Actuals YTD June	YTD Actuals vs. Budget		Explanations
			\$	%	
Wastewater					
Interception & Pumping (I&P)	\$46,925	\$23,147	(\$23,778)	-50.7%	<u>Underspending</u> Chelsea Creek Headworks Upgrades - Construction and REI: \$15.2M (due to timing of odor control equipment delivery, delay in commissioning channel 1 and redesign of lower roofs) Nut Island Odor Control & HVAC Design/CA/REI and Construction : \$5.7M (delay in completion of design documents) Interceptor Renewal 3, Dorchester Interceptor Sewer - Construction: \$930k, Remote Headworks & Deer Island Shaft Study: \$718k, Prison Point Rehab - Construction: \$465k, Siphon Structure Rehabilitation Design/CS/RI: \$268k and Sections 4, 5, 6, 186 - Design CA/RI: \$186k (schedule shifts) Wastewater Meter System Planning/Study/Design: \$634k (police details and temporary meter work less than anticipated) Wastewater Central Monitoring Design and Programming Services, and Equipment/Hardware: \$432k (timing of work and purchases) Meter Modems-Antenna Replacement: \$300k (project to be completed through CEB) Wiggins Terminal Pump Station Design: \$199k (work to be performed through task order consultant services) Sections 4, 5, 6, 186 - Study: \$114k (work completed in FY18) <u>Offset Overspending</u> Alewife Brook Pump Station Rehab - Construction and CA/REI: \$501k (due to timing of final work) Interceptor Renewal 1, Reading Extension Sewer - Construction: \$428k, Prison Point Piping Rehabilitation: \$262k and DeLauri Pump Station Screens & Security Upgrades: \$209k (work scheduled for FY18 performed in FY19)

**ATTACHMENT B
FY19 CIP Year-to-Date Variance Report (\$000's)**

	FY19 Budget YTD June	FY19 Actuals YTD June	YTD Actuals vs. Budget		Explanations
			\$	%	
Treatment	\$21,895	\$10,024	(\$11,870)	-54.2%	<u>Underspending</u> Clarifier Rehabilitation Phase 2 - Construction and REI: \$5.3M (delayed due to schedule shift) HVAC Equipment Replacement - Design, Construction and REI: \$4.3M (contract being re-scoped) Chemical Tank Relining & Pipe Replacement: \$1.5M (project scope combined with Gravity Thickener Overflow Piping project and schedule shift) Clinton Roofing Rehabilitation: \$839k (schedule shift and delay in start of work) Radio Repeater System Upgrades - Phase 1 & 2: \$563k (award delayed and specifications changed) Eastern Seawall Design/ESDC/REI: \$341k (schedule shift) Gas Protection System Replacement Phase 1: \$215k (schedule shift) <u>Offset Overspending</u> Gravity Thickener Rehab: \$1.8M (contractor progress) Phosphorus Removal - Construction: \$170k (work scheduled for FY18 performed in FY19)
Residuals	\$3,179	\$833	(\$2,345)	-73.8%	<u>Underspending</u> Electrical Improvements \$1.3M and Mechanical Improvements \$656k (scope of work incorporated into Electrical, Mechanical, & Drum Replacements contract and schedule shift) Pellet Piping Relocation: \$550K (schedule shift) <u>Offset Overspending</u> Sludge Tank & Silo Coating: \$115k (due to work scheduled for FY18 completed in FY19)
CSO	\$2,598	\$1,196	(\$1,402)	-54.0%	<u>Underspending</u> Somerville Marginal In-System Storage: \$1.4M (shift in Somerville design and construction schedule)
Other Wastewater	\$19,206	\$39,649	\$20,443	106.4%	<u>Overspending</u> I/I Local Financial Assistance: \$20.4M (greater than budgeted requests for grants and loans)
Total Wastewater	\$93,803	\$74,850	(\$18,953)	-20.2%	

ATTACHMENT B
FY19 CIP Year-to-Date Variance Report (\$000's)

	FY19 Budget YTD June	FY19 Actuals YTD June	YTD Actuals vs. Budget		Explanations
			\$	%	
Waterworks					
Drinking Water Quality Improvements	\$1,669	\$770	(\$899)	-53.9%	<u>Underspending</u> Technical Assistance: \$633k (timing of task order work) Existing Facilities Modifications - CP 7: \$276k (updated schedule for Cosgrove Boat Storage work)
Transmission	\$14,712	\$9,914	(\$4,798)	-32.6%	<u>Underspending</u> Maintenance Garage/Wash Bay/Storage Building: \$2.7M (schedule shift) Chestnut Hill Emergency Pump Station Improvements - Design/CA/RI: \$1.1M (delay in award) Metropolitan Redundancy Interim Improvements Tops of Shaft Design/CA/RI: \$600k (design to be completed under existing Technical Assistance contract) Commonwealth Avenue Pump Station Improvements - Design/CA/RI: \$379k and Construction: \$594k (CA & RI services delayed as a result of change in construction notice to proceed) Wachusett Aqueduct Pump Station - Design/ESDC/RI: \$562k (less than anticipated resident engineering services) Metropolitan Tunnel Redundancy Preliminary Design & MEPA Review: \$500k (schedule shift) WASM 3 - MEPA/Design/CA/RI: \$390k (test pits work delayed) <u>Offset Overspending</u> Watershed Land Acquisition: \$1.2M (timing of land purchases) Wachusett Aqueduct Pump Station - Construction: \$447k (due to project progress) Rosemary Brook Siphon Building Repair: \$386k (timing of final payment) Metropolitan Tunnel Redundancy Program Support Services: \$247k (contract established and awarded prior to Preliminary Design)

**ATTACHMENT B
FY19 CIP Year-to-Date Variance Report (\$000's)**

	FY19 Budget YTD June	FY19 Actuals YTD June	YTD Actuals vs. Budget		Explanations
			\$	%	
Distribution & Pumping	\$41,074	\$36,603	(\$4,471)	-10.9%	<u>Underspending</u> SEH Redundancy Pipeline Section 111 - Construction Phase 3: \$3.9M (due to delay in notice to proceed and issue with MBTA crossing) Peabody Pipeline Project: \$2.3M (project cancelled) New Connecting Mains CP3 (Sect 23,24,47) - Final Design/CA/RI: \$749k (delayed utility relocation) Sections 53 and 99 Connections - Design/CA/RI: \$443k and Section 56 Replacement/Saugus Design/CA/RI: \$200k (schedule shifts) Section 14 Water Pipe Relocation (Malden): \$180k (work scheduled for FY19 performed in FY18) <u>Offset Overspending</u> NHS - Revere & Malden Pipeline Section 56 Pipe Demolition - Construction: \$949k, NIH Section 89 and 29 Redundancy - Construction Phase 2: \$653k, Construction Phase 1B and 1C: \$556k, and Design: \$184k, SEH Redundancy Pipeline Section 111 - Construction Phase 1 & 2: \$1.2M, Cathodic Protection of Shafts E & L: \$255K, and Sections 50 & 57 Water & 21/20/19 Sewer Rehab - Design/CA/RI: \$125k (all due to project progress)
Other Waterworks	\$19,630	\$18,359	(\$1,270)	-6.5%	<u>Underspending</u> Deer Island Water Tank Repainting : \$3.2M: Delay in notice to proceed and contract award less than budgeted) Bellevue II & Turkey Hill Water Tanks Repainting: \$2.4M (award less than budgeted and additional structural repairs and antenna relocation delays) Generator Docking Station: \$382k (delay in the award and long lead time for equipment) Cosgrove Intake Roof Replacement: \$365k (delay in start of work) Gillis Pump Station/Cottage Farm CSO Facility Roof Replacements: \$280k and Steel Tank Improvements - Design/CA/RI: \$273k (all due to schedule shifts) <u>Offset Overspending</u> Local Water Pipeline Financial Assistance Program: \$5.5M (greater than budgeted requests for loans), and Carroll Water Treatment Plant SCADA Upgrades - Design/Programming RE services: \$157K (consultant progress)
Total Waterworks	\$77,085	\$65,647	(\$11,438)	-14.8%	

**ATTACHMENT B
FY19 CIP Year-to-Date Variance Report (\$000's)**

	FY19 Budget YTD June	FY19 Actuals YTD June	YTD Actuals vs. Budget		Explanations
			\$	%	
Business & Operations Support					
Total Business & Operations Support	\$7,968	\$2,408	(\$5,560)	-69.8%	Underspending MIS Projects: \$2.6M (due to timing of work) As-Needed Technical Assistance: \$1.6M (due to timing of task order work) Security Equipment & Installation: \$404k, FY19-23 Vehicle Purchases: \$396k and Major Lab Instrumentation: \$250k (timing of purchases)
Total MWRA	\$178,856	\$142,904	(\$35,951)	-20.1%	

ATTACHMENT C
FY19 Planned versus Actual/Revised Contract Awards (\$ in Millions)

Project	Contract No.	Subphase	Notice to Proceed	FY20 Final Notice to Proceed	Total Contract Amount (\$000s)	Award Amount	Vendor	* Schedule Change Reason Code
Application Improvements Program	7286	Lawson Upgrade	Jul-18	Jul-20	\$2.7			6
Application Improvements Program	7438	Enterprise Content Management	Jul-18	Sep-19	\$1.3			3 & 5
Information Technology Management Program	7408	IT Project Management Methodology	Jul-18	Apr-19	\$0.2			3 & 6
Facility Asset Protection	7237	Remote Hdwks & DI Shaft Study	Jul-18	Sep-18	\$0.8	\$1.4	Mott MacDonald, LLC	1
Residuals Asset Protection	7152	Electrical Improvements	Jul-18	Contract combined with Mechanical and Drum Dryer Replacements contract.	\$2.2			2
Waterworks Facility Asset	7634	Paint Bellevue II and Turkey Hill Tanks	Jul-18	Aug-18	\$5.7	\$4.0	Worldwide Industries Corp.	1
Dam Projects	7614	Sudbury/Foss Dam Design Construction Administration/Resident Inspection	Jul-18	Mar-19	\$0.2	\$0.4	GZA GeoEnvironmental, Inc.	1
Metropolitan Redundancy Interim Improvements	7560	Tops of Shaft Design/Construction Administration/Resident Inspection	Jul-18	Contract deleted. Will use As-Needed Design.	\$2.2			2
Metropolitan Redundancy Interim Improvements	7575	Weston Aqueduct Supply Mains/Spot Pond Supply Mains Pressure Reducing Valves Design/Construction Administration/Resident Inspection	Jul-18	Jul-18	\$4.2	\$2.8	CDM Smith	1
DI Treatment Plant Asset Protection	7094	HVAC Equipment Replacement Resident Engineering Inspection	Aug-18	Mar-20	\$2.0			3 & 7
DI Treatment Plant Asset Protection	7110	HVAC Equipment Replacement - Construction	Aug-18	Mar-20	\$40.2			3 & 7
Waterworks Facility Asset Protection	7022	Cosgrove Intake Roof Replacement	Aug-18	Nov-18	\$0.6	\$0.9	Greenwood Industries	1
Capital Maintenance Planning & Support	7629	As-Needed Construction Services/Resident Engineering Inspection Contract 1	Sep-18	Sep-18	\$1.5	\$1.5	Kleinfelder Northeast, Inc.	1

ATTACHMENT C
FY19 Planned versus Actual/Revised Contract Awards (\$ in Millions)

Project	Contract No.	Subphase	Notice to Proceed	FY20 Final Notice to Proceed	Total Contract Amount (\$000s)	Award Amount	Vendor	* Schedule Change Reason Code
Capital Maintenance Planning & Support	7630	As-Needed Construction Services/Resident Engineering Inspection Contract 2	Sep-18	Sep-18	\$1.5	\$1.5	MWH Construction	1
Braintree-Weymouth Relief Facilities	7435	B/W Improvements - Design/Construction Services/Resident Inspection	Sep-18	Dec-18	\$1.9	\$2.1	Wright-Pierce	1
Residuals Asset Protection	7173	Pellet Piping - Relocate	Sep-18	Jul-19	\$3.0			3 & 7
DI Treatment Plant Asset Protection	7167	Gas Protect System Replacement Phase 1	Sep-18	Jun-19	\$1.0			3 & 6
DI Treatment Plant Asset Protection	7273	Chemical Tank Relining and Pipe Replacement	Sep-18	Jul-19 Combined with contract 7449 (\$5M)	\$1.5	\$8.5	Walsh Construction Co.	1
Waterworks Facility Asset Protection	6888	Gillis Pumping Station/Cottage Farm CSO Roof Replacement	Sep-18	May-19	\$0.4	\$0.5	Titan Roofing, Inc.	1
Waterworks Facility Asset Protection	7025	Generator Docking Station	Sep-18	May-19	\$0.8	\$0.9	Fall River Electrical Associates Co.	1
NHS - Revere & Malden Pipeline Improvements	7485	Sect 53 and 99 Connection-Design Construction Administration/Resident Inspection	Oct-18	Jul-19	\$4.8			3 & 5
New Connect Mains-Shaft 7 to WASM 3	6955	Intermediate High Pipeline Improvements Design and Engineering Services During Construction	Oct-18	Jan-19	\$2.7	\$6.5	CDM Smith Inc.	1
Waterworks Facility Asset Protection	7542	Water Meter Upgrade Design Construction Administration/Resident Inspection	Oct-18	19-Oct	\$0.2			3 & 5
Metropolitan Redundancy Interim Improvements	7574	Chestnut Hill Emergency Pump Station Design/Engineering Services During Construction	Oct-18	Apr-19	\$6.7	\$2.1	Hazen & Sawyer, P.C.	1

ATTACHMENT C
FY19 Planned versus Actual/Revised Contract Awards (\$ in Millions)

Project	Contract No.	Subphase	Notice to Proceed	FY20 Final Notice to Proceed	Total Contract Amount (\$000s)	Award Amount	Vendor	* Schedule Change Reason Code
Facility Asset Protection	7421	Sections 4, 5, 6, 186 - Design Construction Administration/Resident Inspection	Nov-18	Jul-20	\$1.7			6
Facility Asset Protection	7551	Wiggins Term Pump Station Design	Nov-18	Work will be done under a Technical Assistance contract.	\$0.5			2
DI Treatment Plant Asset Protection	7395	Clarifier Rehabilitation Phase 2 - Construction	Nov-18	Aug-19	\$129.9			3 & 5
Corrosion & Odor Control	7548	Nut Island Odor Ctrl HVAC Improvements Construction Phase 2	Dec-18	Sep-19	\$38.2			3 & 4
Clinton Wastewater Treatment Plant	7372	Valves & Screw Pumps Replacement	Dec-18	Aug-19	\$1.9			3 & 5
July 2018-December 2018		29 Contracts Planned			\$260.6	\$33.1		
MWRA Facilities Management	6983	Design/Engineering Services	Jan-19	Oct-19	\$0.2			3 & 5
Siphon Structure Rehabilitation	6224	Design/Construction Services/Resident Inspection	Jan-19	Sep-19	\$1.5			3 & 5
Wastewater Meter System-Equipment Replacement	7639	Meter Modems-Antenna Replacement	Jan-19	Work being done under the Current Expense Budget.	\$0.4			2
DI Treatment Plant Asset Protection	6963	Combined Heat & Power Alternatives Study	Jan-19	Apr-19	\$0.8	\$1.1	Black & Veatch Corp.	1
DI Treatment Plant Asset Protection	7051	Fire Alarm System Replacement Construction	Jan-19	Feb-20	\$20.0			3 & 7
DI Treatment Plant Asset Protection	7426	Fire System Replacement - Resident Engineering Inspection	Jan-19	Feb-20	\$2.1			3 & 7
NHS - Revere & Malden Pipeline Improvements	7454	Section 56 Replacement/Saugus Design Construction Administration/Resident Inspection	Jan-19	Aug-19	\$2.0			3 & 5
NHS - Revere & Malden Pipeline Improvements	7536	Section 56 Pipe Demolition Construction	Jan-19	Oct-18	\$1.5	\$1.9	R. Zoppo	1

ATTACHMENT C
FY19 Planned versus Actual/Revised Contract Awards (\$ in Millions)

Project	Contract No.	Subphase	Notice to Proceed	FY20 Final Notice to Proceed	Total Contract Amount (\$000s)	Award Amount	Vendor	* Schedule Change Reason Code
Cathodic Protection Of Distribution Mains	6440	Cathodic Protection Shafts E&L	Jan-19	Jan-19	\$0.9	\$0.9	CorTech	1
South Spine Distribution Mains	7155	Section 22 Rehabilitation Alternatives Analysis and Environmental Permitting	Jan-19	Jun-19	\$1.0			3 & 7
Central Monitoring System	7581	CWTP SCADA Upgrade Design Program Resident Engineering	Jan-19	Jan-19	\$4.1	\$4.7	Arcasis U.S., Inc.	1
Metropolitan Tunnel Redundancy	7159	Preliminary Design and MEPA Review	Jan-19	Apr-20	\$9.0			3 & 5
Metropolitan Redundancy Interim Improvements	7524	Commonwealth Ave Pump Station Improvements Construction	Jan-19	Feb-19	\$7.0	\$6.9	WES Construction Corp.	1
DI Treatment Plant Asset Protection	7126	South System Pump Station VFD Replace Design/Engineering Services During Construction/Resident Engineering Inspection	Feb-19	Sep-19	\$4.5			3 & 5
DI Treatment Plant Asset Protection	7397	Clarifier Rehabilitation Phase 2 - Resident Engineering Inspection	Feb-19	Aug-19	\$3.0			3 & 5
DI Treatment Plant Asset Protection	7420	Motor Control Center & Switchgear Replace Constr.	Feb-19	Aug-19	\$10.6			3 & 6
Peabody Pipeline Project	6893	Peabody Pipeline Construction	Feb-19	Project deleted.	\$15.2			2
Waterworks Facility Asset Protection	6832	Steel Tank/Improvements Design Construction Administration/Resident Inspection	Feb-19	Sep-19	\$3.3			3 & 5
Facility Asset Protection	7279	Interceptor Renewal 3, Dorchester Interceptor Sewer - Construction	Mar-19	Jul-19	\$5.6			3 & 7
Facility Asset Protection	7462	Prison Point Rehabilitation - Construction	Mar-19	Nov-19	\$31.7			3 & 4
DI Treatment Plant Asset Protection	6723	E Seawall Design/Engineering Services During Construction/Resident Engineering Inspection	Apr-19	Aug-19	\$0.7			3 & 5
DI Treatment Plant Asset Protection	7134	Radio Repter System Upgrade 2	Apr-19	Nov-19	\$2.5			3 & 4

ATTACHMENT C
FY19 Planned versus Actual/Revised Contract Awards (\$ in Millions)

Project	Contract No.	Subphase	Notice to Proceed	FY20 Final Notice to Proceed	Total Contract Amount (\$000s)	Award Amount	Vendor	* Schedule Change Reason Code
New Connect Mains-Shaft 7 to WASM 3	6392	CP3-Sect 23,24,47, Rehabilitation	Apr-19	Sep-19	\$14.3			3 & 4
Metropolitan Redundancy Interim Improvements	7599	Shafts 5 & 9 Bldg Improvements Design Construction Administration/Resident Inspection	Apr-19	Jan-20	\$0.8			3 & 5
Sudbury/Weston Aqued. Repairs	7369	Weston Aqueduct Sluice Gates - Construction	May-19	Sep-19	\$1.1			3 & 7
Facility Asset Protection	7554	Fuel Oil Tank Replacement Construction Phase 1	Jun-19	Dec-19	\$1.4			3 & 5
January 2019- June 2019		26 Contracts Planned			\$145.1	\$48.5		

FY19 55 Planned Contract Awards 18 awarded Thr. June 2019

\$405.7

\$48.5

Unplanned Awards

Clinton Wastewater Treatment Plant	7450	Clinton Roofing Rehabilitation	Jun-18	Sep-18	\$1.2	\$0.7	Greenwood Industries	1
DI Treatment Plant Asset Protection	7122	Radio Repeater System Upgrades- Phase 1	Jun-18	Oct-18	\$0.5	\$0.2	Cyber Communications Solutions, Inc.	1
Equipment Purchase	6760Y	Miscellaneous Fencing Installations and Repairs		Oct-18	\$0.0	\$0.5	R.A.D.Corp	1
Applications Improvements Program	7441	Technical Consulting Services to Implement Water Quality Reporting System		Jan-19	\$0.3	\$0.3	Overture Partners, LLC	1
CWTP Asset Protection	7642	Replacement of Generator No. 1		Feb-19	\$0.0	\$0.4	Ewing Electrical Co.	1
Waterworks Facility Asset Protection	7601	Painting of DI Steel Water Storage Tank	Jun-18	Mar-19	\$3.9	\$2.6	Atlas Painting and Sheeting Corp.	1
Wastewater Process Optimization	7412	Modeling Massachusetts Bay Water Quality		Mar-19	\$7.4	\$0.7	Deltares USA, Inc.	1
Applications Improvements Program	7386	SAP Business Objects Environment		Mar-19		\$0.1	Overture Partners, LLC	1
Residuals Asset Protection	7153	Mechanical, Electrical, and Drum Dryer Replacements	Sep-17/Jul-18	Jun-19	\$10.0	\$8.7	IPC Lydon, LLC	1
Metropolitan Tunnel Redundancy	7655	Program Support Services		Apr-19	\$0.0	\$10.2	JCK Underground, Inc.	1
Waterworks Facility Asset Protection	7024	Towable Generator Docking Stations Resident Engineering and Inspection		Jul-19	\$0.0	\$0.2	Arcadis U.S., Inc.	1

11 Unplanned Awards Through June 2019.

\$23.3

\$24.7

29 Total Awards Through June 2019.

\$73.2

ATTACHMENT C
FY19 Planned versus Actual/Revised Contract Awards (\$ in Millions)

*** Reason Codes:**

1. NTP issued in FY19.
2. Project/Phase eliminated or being performed in-house; or phase completed but on hold.
3. NTP expected in FY20
4. Schedule change due to permitting.
5. Scope changes.
6. Changes in priorities.
7. Bidder Issue/Outside Design Delay/Contractor issue/Additional specification review

ATTACHMENT D
Linear Footage of Rehabilitated or New Pipelines
FY19 (July 2018 - June 2019)

	<u>Contract #</u>	<u>Type</u>	<u>Linear Feet</u>
<u>WASTEWATER PROJECTS</u>			
Reading Extension Sewer Rehabilitation	7164	Rehab	1,458
Alewife Brook Pump Station Rehabilitation	6797	New	10
<u>WATERWORKS PROJECTS</u>			
NIH Section 110 Phase 2	7067	New	8,811
SEH Section 111 CP-2	7504	New	7,412
SEH Section 111 CP-3	7505	New	4,990
<u>TOTAL PIPELINE REHABILITATED OR CONSTRUCTED IN FY19</u>			
	<u>Linear Feet</u>		<u>Miles</u>
Wastewater Projects	1,468		0.3
Water Projects	<u>21,213</u>		<u>4.0</u>
Total	22,681		4.3

**ATTACHMENT E
FY20 PLANNED CAPITAL CONTRACT AWARDS (\$ in Millions)**

Project	Contract No.	Subphase	Notice to Proceed	Total Contract Amount
Applications Improvements Program	7650	Time Entry System / WFM	Jul-19	\$0.6
Applications Improvements Program	7653	8M Permit	Jul-19	\$0.2
Information Security Program (ISP)	7657	ITSM Access Management	Jul-19	\$0.3
Information Technology Infrastructure Program	7654	NetScalers	Jul-19	\$0.1
Information Technology Infrastructure Program	7662	Edge Switches	Jul-19	\$0.7
Information Technology Infrastructure Program	7664	Instrumentation & Controls IT	Jul-19	\$0.3
Facility Asset Protection	7279	Interceptor Renewal 3, Dorchester Interceptor Sewer - Construction	Jul-19	\$5.6
Residuals Asset Protection	7173	Pellet Piping - Relocate	Jul-19	\$3.2
DI Treatment Plant Asset Protection	7373	Chemical Tank and Digester Pipe	Jul-19	\$8.0
NHS - Revere & Malden Pipeline Improvements	7485	Sect 53 and 99 Connections- Design/Construction Administration	Jul-19	\$4.5
CWTP Asset Protection	7605	HVAC Equipment Replacement - Construction	Jul-19	\$1.8
Quabbin Transmission System	7379	Wachusett Dam Lower Gate House Interim Pipe Replacement	Jul-19	\$0.2
Facility Asset Protection	7643	Sections 191 & 192 Rehabilitation	Aug-19	\$0.5
DI Treatment Plant Asset Protection	6723	E Seawall Design/Engineering Services During Construction/Resident Engineering Inspection	Aug-19	\$1.2
DI Treatment Plant Asset Protection	7395	Clarifier Rehabilitation Phase 2 - Construction	Aug-19	\$135.0
DI Treatment Plant Asset Protection	7397	Clarifier Rehabilitation Phase 2 - Resident Engineering Inspection	Aug-19	\$3.0
DI Treatment Plant Asset Protection	7420	Motor Control Center & Switchgear Replacement Construction	Aug-19	\$10.6
Clinton Wastewater Treatment Plant	7372	Valves & Screw Pumps Replacement	Aug-19	\$2.5
NHS - Revere & Malden Pipeline Improvements	7454	Sect 56 Replacement/Saugus Design/Construction Administration	Aug-19	\$1.5
Applications Improvements Program	7438	Enterprise Content Mgmt	Sep-19	\$1.0
Siphon Structure Rehabilitation	6224	Design/Construction Services/Resident Inspection	Sep-19	\$1.6

ATTACHMENT E
FY20 PLANNED CAPITAL CONTRACT AWARDS (\$ in Millions)

Project	Contract No.	Subphase	Notice to Proceed	Total Contract Amount
Corrosion & Odor Control	7548	NI Odor Control HVAC Improvements Construction	Sep-19	\$45.0
DI Treatment Plant Asset Protection	6705	Expansion Joint Repair - Construction 3	Sep-19	\$2.0
DI Treatment Plant Asset Protection	7126	South System Pumping Station VFD Replacement Design/Engineering Services During Construction/Resident Engineering Inspection	Sep-19	\$4.5
New Connect Mains-Shaft 7 to WASM 3	6392	CP3-Sect 23,24,47, Rehabilitation	Sep-19	\$14.3
Waterworks Facility Asset Protection	6832	Steel Tank Improvements Design/Construction Administration	Sep-19	\$3.0
Sudbury/Weston Aqueduct Repairs	7369	Weston Aqueduct Sluice Gates - Construction	Sep-19	\$1.1
MWRA Facilities Management	6983	Design/Engineering Services Old Admin. Building	Oct-19	\$0.6
Information Security Program (ISP)	7440	Information Security Plan Implementation	Oct-19	\$0.4
IT Infrastructure Program	7660	Telephone System Upgrade	Oct-19	\$0.4
Waterworks Facility Asset Protection	6689	Meter Vault Manhole Retrofits - Design	Oct-19	\$0.5
Waterworks Facility Asset Protection	7542	Water Meter Upgrade Design Construction Administration/Resident Inspection	Oct-19	\$0.2
Metropolitan Redundancy Interim Improvements	7561	CP1 Shafts 6, 8, 9A	Oct-19	\$2.1
Metropolitan Redundancy Interim Improvements	7696	Tops of Shafts Resident Engineering Inspection	Oct-19	\$0.8
Metropolitan Redundancy Interim Improvements	7547	Waltham Water Pipeline Design/Construction Administration	Oct-19	\$3.0
Watershed Division Capital Improvements	7677	Maintenance Garage/Wash Bay/Storage Building Design/Construction Administration/Resident Inspection	Oct-19	\$1.0
Facility Asset Protection	7162	Hayes Pump Station Rehab Design	Nov-19	\$1.5
Facility Asset Protection	7462	Prison Point Rehabilitation - Construction	Nov-19	\$36.1
DI Treatment Plant Asset Protection	7134	Radio Repeater System Upgrade 2	Nov-19	\$2.5
Rehabilitation of Other Pumping Stations	7525	Pumping Station Rehabilitation-Evaluation	Nov-19	\$0.5
Applications Improvements Program	7649	Lawson Golbal HR	Dec-19	\$0.7
Facility Asset Protection	7554	Fuel Oil Tank Replacement Construction Phase 1	Dec-19	\$1.4

**ATTACHMENT E
FY20 PLANNED CAPITAL CONTRACT AWARDS (\$ in Millions)**

Project	Contract No.	Subphase	Notice to Proceed	Total Contract Amount
DI Treatment Plant Asset Protection	7644	As-Needed Design 9-1	Dec-19	\$2.8
DI Treatment Plant Asset Protection	7645	As-Needed Des 9-2	Dec-19	\$2.8
DI Treatment Plant Asset Protection	7646	As-Needed Design 9-3	Dec-19	\$2.8
July 2019 - December 2019		45 Contracts Planned		\$312.0
Information Security Program (ISP)	7659	Active Directory	Jan-20	\$0.2
Facility Asset Protection	7216	Interceptor Renewal 7- Study/Design/Construction Administration/Resident Engineering Inspection	Jan-20	\$0.9
Clinton Wastewater Treatment Plant	7693	Equip Storage Bldg	Jan-20	\$0.3
Quabbin Transmission System	7380	Wachusett Lower Gate House Pipe Replacement Construction	Jan-20	\$2.6
Metropolitan Redundancy Interim Improvements	7599	Shafts 5 & 9 Impr Design/Construction Administration	Jan-20	\$0.8
Wastewater Meter System-Equipment Replacement	7191	Wastewater Metering Asset Protect/Equip Purch	Feb-20	\$3.7
Facility Asset Protection	7429	Ward St & Columbus Park Headworks Design/Construction Administration	Feb-20	\$11.4
DI Treatment Plant Asset Protection	7051	Fire Alarm System Replacement - Construction	Feb-20	\$25.0
DI Treatment Plant Asset Protection	7426	Fire System Replacement - Resident Engineering Inspection	Feb-20	\$2.1
DI Treatment Plant Asset Protection	7094	HVAC Equipment Replacement Resident Engineering Inspection	Mar-20	\$2.0
DI Treatment Plant Asset Protection	7110	HVAC Equipment Replacement - Construction	Mar-20	\$50.2
Quabbin Transmission System	6940	Oakdale High Line Replacement Construction	Mar-20	\$0.5
Waterworks Facility Asset Protection	7694	Masonry/Structural Repairs Bellevue 1/Arlington Heights	Apr-20	\$2.2
Metropolitan Tunnel Redundancy	7159	Preliminary Design & Massachushtts Environmental Protection Act Review	Apr-20	\$16.0
Metropolitan Redundancy Interim Improvements	7671	CP3 Shafts 5, 9	Apr-20	\$2.5
DI Treatment Plant Asset Protection	7570	Hydroturbine Replacement Design/Engineering Services During Construction/Resident Engineering Inspection	Jun-20	\$1.9

ATTACHMENT E
FY20 PLANNED CAPITAL CONTRACT AWARDS (\$ in Millions)

Project	Contract No.	Subphase	Notice to Proceed	Total Contract Amount
Distribut Systems Facilities Mapping	7489	Update of Record Drawings	Jun-20	\$0.5
Quabbin Transmission System	7698	Wachusett Lower Gate House Building Rehabilitation	Jun-20	\$2.2
January 2020 - June 2020		18 Contracts Planned		\$124.9
Total FY20		63 Contracts Planned		\$437.0

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: FY19 Year-End Financial Update and Summary



COMMITTEE: Administration, Finance & Audit

INFORMATION
 VOTE

Michael J. Cole, Budget Director
Preparer/Title



Thomas J. Durkin
Director, Finance



RECOMMENDATION:

For information only. This staff summary provides the financial results and variance highlights for Fiscal Year 2019, based on the audited fiscal-year financial close.

DISCUSSION:

The total FY19 year-end variance is \$13.5 million (after \$17.1 million defeasance), due to lower direct expenses of \$5.9 million, lower indirect expenses of \$2.6 million, and lower debt service costs of \$633,000, offset by higher revenue of \$4.4 million.

The largest variances in comparison with the budget are highlighted below:

\$5.9 million of below budget direct expenses were the result of lower spending for Wages & Salaries, Maintenance, Professional Services, Fringe Benefits, and Other Materials.

\$4.4 million higher revenue was driven by favorable investment income of \$3.4 million.

\$2.6 million of below budget indirect expenses was driven by lower Watershed reimbursements (\$3.0 million) associated with lower costs for compensation, fringe benefits, capital projects, and PILOT payments.

Of the \$13.5 million year-end surplus, \$2.0 million will be utilized to pay for the River Road project at the Wachusett Dam and the \$890,239 in Debt Service Assistance, as in prior years, was applied against the FY20 budget.

Staff are recommending that the remaining approximately \$10.6 million of the FY19 surplus be used to defease debt to provide targeted rate relief for communities in future challenging years. This rate management strategy has proven to be very effective in the past few years in managing assessment increases over time. The proposed defeasance scenario is being presented to the Board at this meeting in a separate staff summary.

FY19 Current Expense Budget

The CEB expense variances through June 2019 by major budget category were:

- Lower Direct Expenses of \$5.9 million or 2.5% under budget. Spending was lower for Wages and Salaries, Maintenance, Professional Services, Fringe Benefits, and Other Materials. This is offset by higher spending on Utilities, Overtime, Other Services, Worker's Compensation, Chemicals, and Training and Meetings.
- Lower Indirect Expenses of \$2.6 million or 5.5% due to lower Watershed reimbursements and expenses related to the HEEC cable, offset by higher expenses for Insurance claims.

FY19 Budget and FY19 Actual Year-to-Date Variance by Expenditure Category
(in millions)

	FY19 Budget YTD	FY19 Actual YTD	\$ Variance	% Variance
Direct Expenses	\$239.6	\$233.7	-\$5.9	-2.5%
Indirect Expenses	\$46.0	\$43.4	-\$2.6	-5.5%
Capital Financing	\$482.4	\$481.7	-\$0.6	-0.1%
Total	\$768.0	\$758.8	-\$9.2	-1.2%

Totals may not add due to rounding

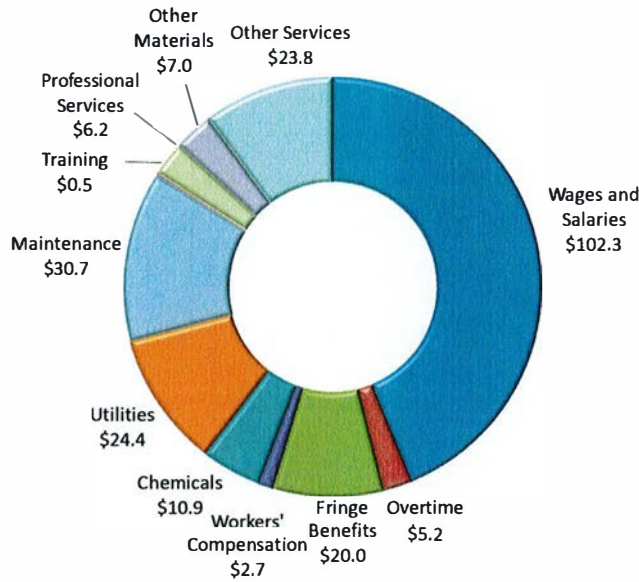
Total Revenues of \$772.3 million were \$4.4 million or 0.6% over budget. The majority of the variance is pertaining to the favorable short-term rates for investment income.

Please refer to Attachment 1 for a more detailed comparison by line item of the budget variances for the year-to-date.

Direct Expenses

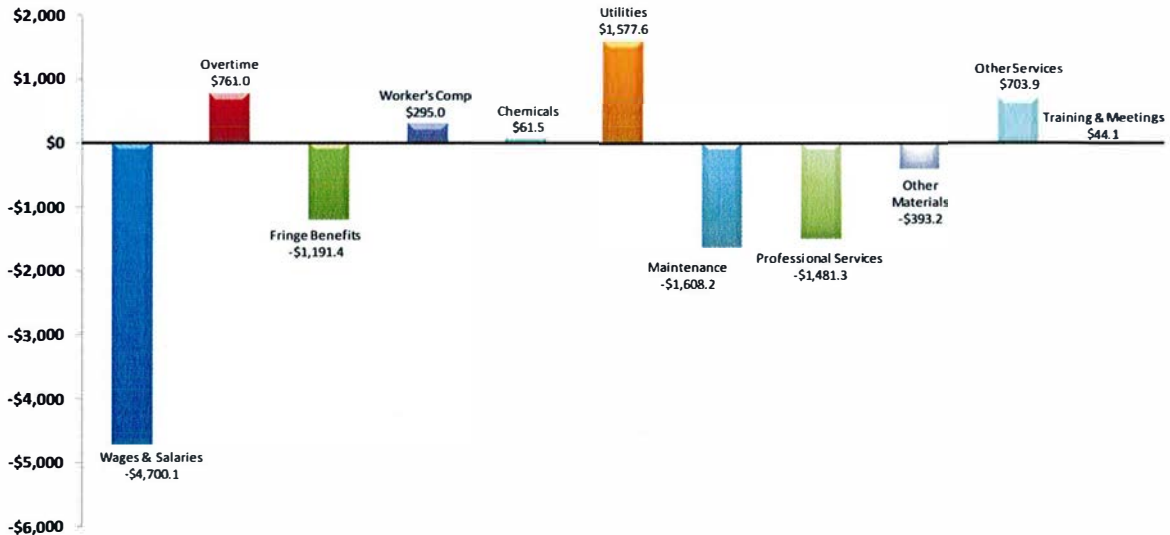
Year-to-date direct expenses totaled \$233.7 million, which was \$5.9 million or 2.5% less than budgeted.

**FY19 Year-to-Date Direct Expenses
(in millions)**



Lower than budgeted spending for Wages and Salaries, Maintenance, Professional Services, Fringe Benefits, and Other Materials are partially offset by higher spending for Utilities, Overtime, Other Services, Worker's Compensation, Chemicals, and Training and Meetings.

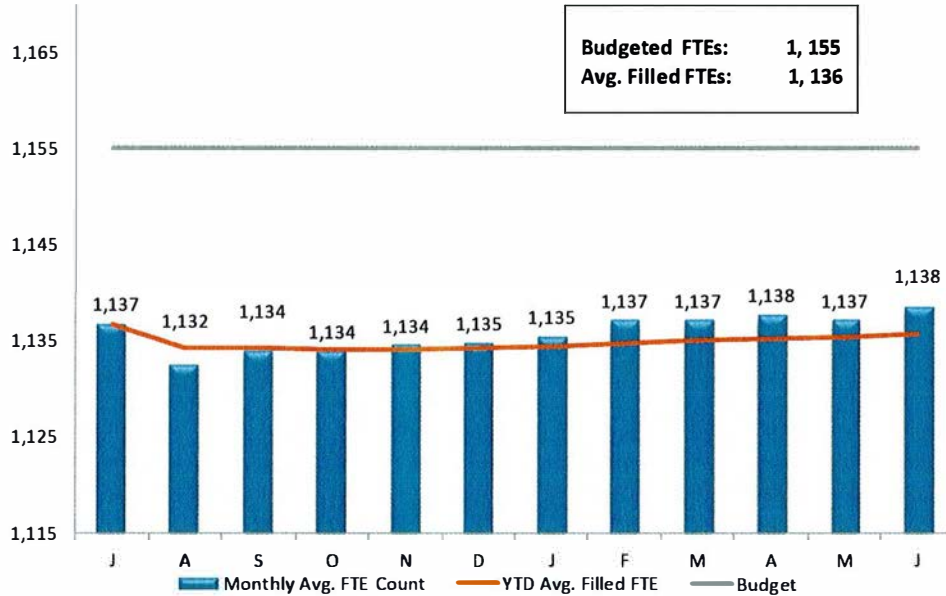
**FY19 Year-to-Date Direct Expense Variance
(in thousands)**



Wages and Salaries

Wages and Salaries are under budget by \$4.7 million or 4.4%. At year end, there were 19 fewer average FTEs (1,136 versus 1,155 budget) or 1.6% and lower average salaries for new hires versus retirees. The timing of backfilling vacant positions and lower leave balance accruals also contributed to Regular Pay being under budget.

FY19 MWRA Full Time Equivalent (FTE) Position Trend



Maintenance

Maintenance was under budget by \$1.6 million or 5.0%, driven by Field Operations (\$1.6 million). Much of the underspending in Field Operations is due to the timing delays for projects that will be completed later than budgeted.

Professional Services

Professional Services were under budget by \$1.5 million or 19.3%. The overall underspending year-to-date is due to Other Professional Services (\$0.6 million) in Human Resources, Law, Operations, and Finance; Legal Services (\$0.3 million) in Law and Human Resources; Engineering Services (\$0.2 million); Lab Testing and Analysis (\$0.2 million) in EnQual and Lab Services; and Computer System Consultants (\$0.2 million) in MIS.

Fringe Benefits

Fringe Benefit spending was lower than budget by \$1.2 million or 5.6%. This is primarily driven by lower Health Insurance costs of \$1.1 million due to fewer employees and retirees participating in health insurance plans, the change to the ratio of employee contribution for past employees

versus new hires that contribute at a higher percentage, and change from family to individual plans which are less costly.

Other Materials

Other Materials were under budget by \$0.4 million or 5.3%, largely due to the timing of purchases related to Equipment/Furniture (\$0.3 million) and Vehicles (\$0.3 million) due to pricing being lower than expected as well as two vehicle purchases that were moved to the CIP (but budgeted in the CEB) because their cost was greater than \$0.1 million which meets the capitalization threshold. This is offset by overspending for Computer Hardware in MIS by \$0.1 million.

Utilities

Utilities were overspent by \$1.6 million or 6.9%. Electricity overspending of \$1.4 million or 7.9% is driven by Deer Island (\$0.9 million) and Field Operations (\$0.5 million), due to new contract pricing retroactive to November 2018. In addition, Diesel Fuel was over budget by \$0.2 million or 7.4% due to the timing of deliveries at Deer Island.

Overtime

Overtime expenses were higher than budget by \$0.8 million or 17.1%. The over spending for the fiscal year was mainly in Wastewater Operations due to wet weather events.

Other Services

Other Services were over budget by \$0.7 million or 3.1%. The main area of overspending was for Sludge Pelletization (\$1.2 million) due to higher year-to-date quantities. This overage was offset by lower spending for Telecommunications (\$0.3 million) in MIS and Field Operations and in Other Services (\$0.2 million) for a number of services, including the timing of Technical Assistance for lead issues in Planning; the switch from renting modems to purchasing them for the Contaminant Monitoring System in Water Quality Assurance; and remediation projects managed by Real Property/Environmental Management.

Worker's Compensation

Worker's Compensation expenses were higher than budget by \$295,000 or 12.2%. The higher expenses were primarily due to unfavorable variances in compensation payments (\$349,000) and medical payments (\$8,000), offset by a favorable administrative expense variance (\$62,000).

Chemicals

Chemicals were higher than budget by \$61,000 or 0.6%. The majority of the variance for Chemicals was the result of higher Ferric Chloride at Deer Island and Clinton; higher Sodium Hypochlorite usage at Deer Island and Wastewater Operations due to wet weather; and higher Sodium Hypochlorite at the Carroll Water Treatment Plant due to higher usage of Wachusett Reservoir water versus the higher quality water from the Quabbin Reservoir, which required higher

dosages to disinfect the water. This is offset by lower spending for Soda Ash at Carroll Water Treatment Plant and lower Hydrogen Peroxide at Deer Island. Through June, Deer Island flows are 7.5% greater than budget and the Carroll Plant flows are 4.8% less than budgeted.

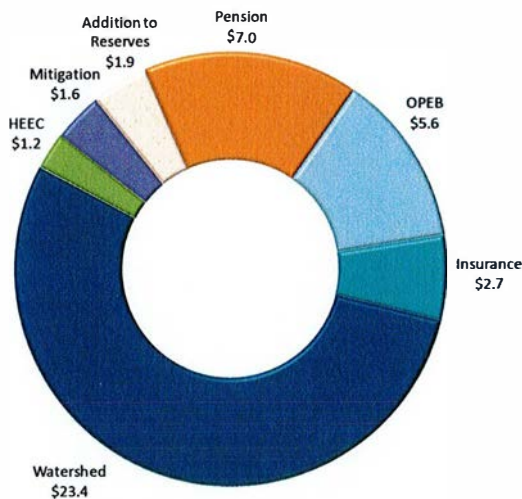
Training & Meetings

Training & Meetings expenses were slightly higher than budgeted by \$44,000 or 9.7% driven by higher spending in Field Operations.

Indirect Expenses

Year-to-date Indirect Expenses totaled \$43.4 million, which is \$2.6 million or 5.5% under budget. There are variances within the lines that comprise Indirect Expenses, including lower Watershed Reimbursements and HEEC cable costs. Watershed costs are lower than budget by \$3.0 million due to lower costs associated with compensation, fringe benefits, capital projects, and PILOT payments. HEEC charges are under budget by \$0.2 million for the low voltage switchgear upgrades.

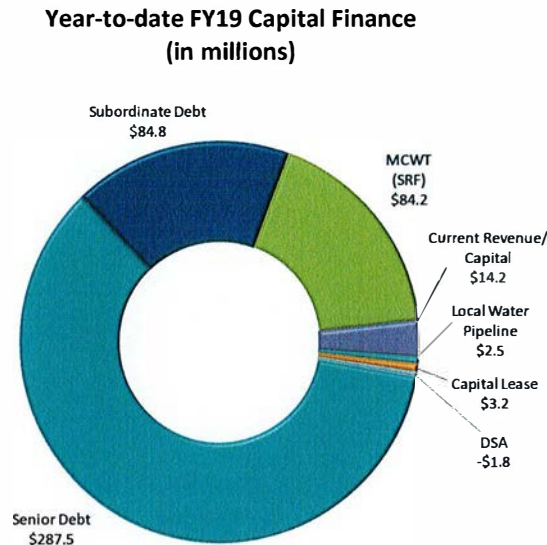
FY19 Year-to-date Indirect Expenses-YTD
(in millions)



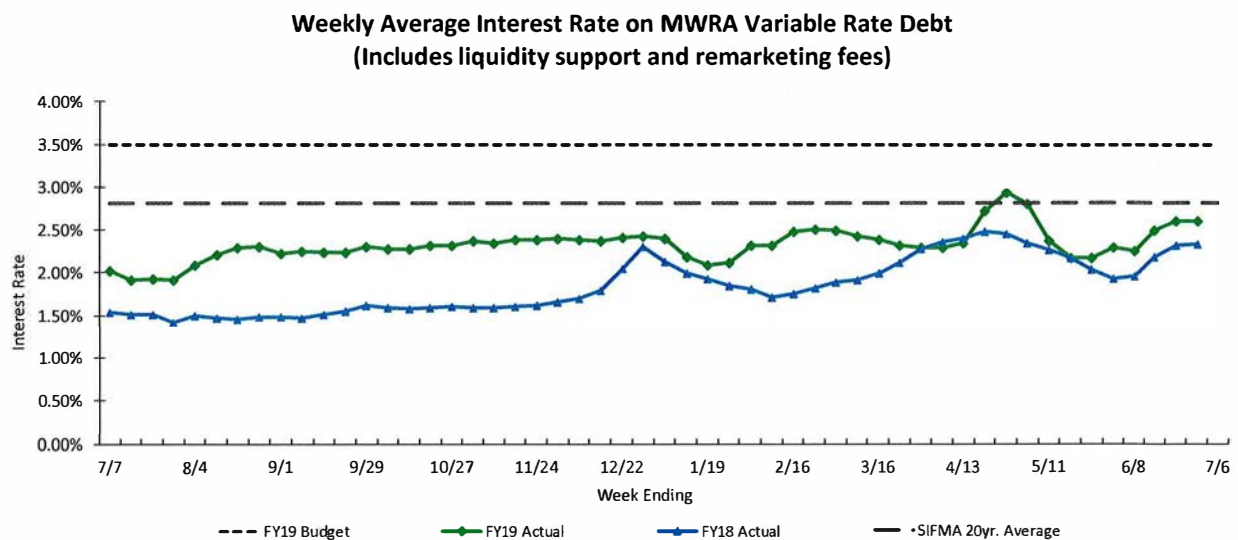
Capital Financing

Capital Financing expenses include the principal and interest payments for fixed debt, the variable subordinate debt, the Massachusetts Clean Water Trust (SRF) obligation, the commercial paper program for the local water pipeline projects, current revenue for capital, and the Chelsea Facility lease payment.

Year-to-date Capital Financing expenses for FY19 totaled \$481.7 million, which is \$633,000 or 0.1% below budget after the use of \$17.1 million of year-to-date surplus to defease bonds in June 2019 which will have a favorable impact in the FY20-22 period. The surplus is primarily attributable to short-term variable rates.



The graph below reflects the FY19 actual variable rate trend by week year-to-date against the FY19 Budget.



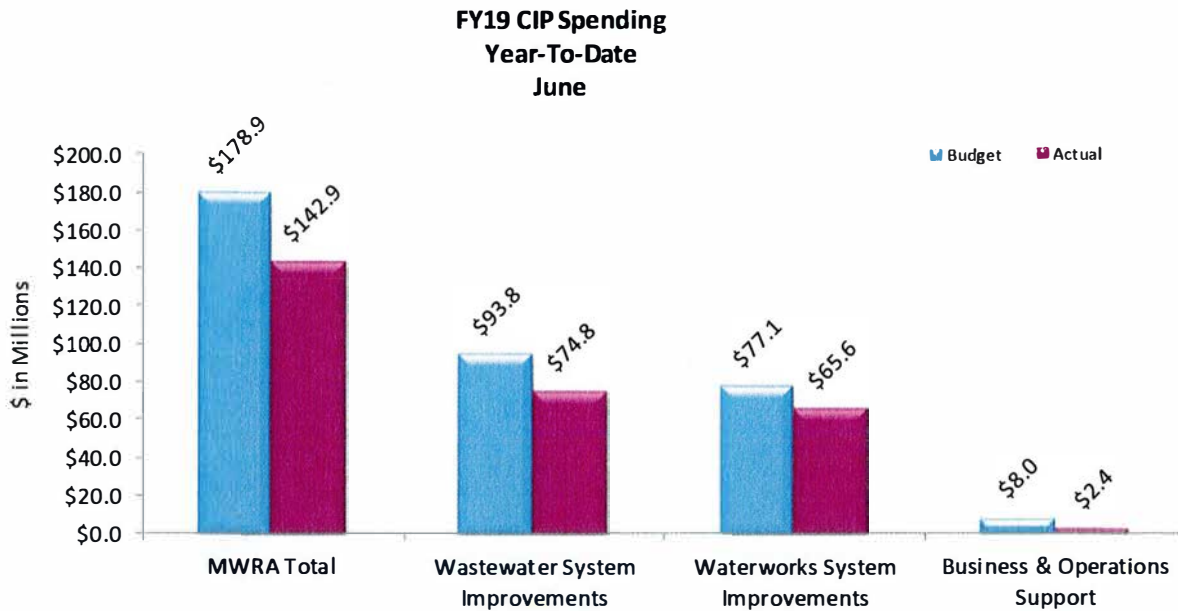
Revenue & Income

Year-to-date Revenues of \$772.3 million were over budget by \$4.4 million or 0.6%. Investment income was over budget by \$3.4 million due to favorable returns on investment income (average short-term rates were higher than budgeted: 2.45% vs. 1.75%). In addition, Other Revenue was favorable to budget due to the income from the disposal of equipment (\$0.4 million), emergency water surcharges for the town of Burlington (\$0.2 million), and miscellaneous revenue (\$0.2 million)

FY19 Capital Improvement Program

Capital expenditures in Fiscal Year 2019 through June total \$142.9 million, \$36.0 million or 20.1% under budget.

After accounting for programs which are not directly under MWRA's control, most notably the Inflow and Infiltration (I/I) grant/loan program, the Local Water System Assistance loan program, and the community managed Combined Sewer Overflow (CSOs) projects, capital spending totaled \$89.4 million, \$61.9 million or 40.9% under budget.



Overall, CIP spending reflects the underspending in Wastewater Improvements (\$19.0 million), Waterworks (\$11.4 million) and Business and Operations Support (\$5.6 million). Major variances in Wastewater are primarily due to construction delays for the Chelsea Creek Headworks Upgrades for Channel 1 work, odor control equipment delivery and redesign of lower roofs, Nut Island Odor Control and HVAC Upgrades Construction, Deer Island Clarifier Rehabilitation Construction 2, and Dorchester Interceptor Sewer Construction due to updated schedules, Deer Island HVAC Equipment Replacement, Residuals Electrical and Mechanical Upgrades and DI Chemical Tank Reline & Digester Tank Rehabilitation due to revised scope and schedules, and Somerville Marginal In-System Storage project due to delay in Somerville design and construction awards, partially offset by greater than anticipated community requests for grants and loans for the I/I Local Financial Assistance Program, and greater than anticipated contractor progress for the Gravity Thickener Rehabilitation contract.

Waterworks variances are primarily due to delay in notice to proceed and MBTA crossing issues for Southern Extra High (SEH) Section 111 Construction 3, and Maintenance Garage/Washbay/Storage Building due to delay in schedule, Deer Island Water Tank Painting award less than budget and schedule shift, Bellevue Tank 2/Turkey Hill Painting contract awarded

less than budget and additional structural repairs and antenna relocation delays, Chestnut Hill Emergency Pumping Station Design/CA due to schedule shift, partially offset by greater than anticipated community requests for loans as well as contractor progress on the Section 56 Pipe Demolition Construction, Southern Extra High (SEH) Section 111 Construction Phase 2, and timing of watershed land purchases.

FY19 Budget and FY19 Actual Year-to-Date Variance by Program
(in millions)

\$ in Millions	Budget	Actuals	\$ Var.	% Var.
Wastewater System Improvements				
Interception & Pumping	46.9	23.1	(23.8)	-50.7%
Treatment	21.9	10.0	(11.9)	-54.2%
Residuals	3.2	0.8	(2.3)	-73.8%
CSO	2.6	1.2	(1.4)	-54.0%
Other	19.2	39.6	20.4	106.4%
Total Wastewater System Improvements	\$93.8	\$74.8	(\$19.0)	-20.2%
Waterworks System Improvements				
Drinking Water Quality Improvements	1.7	0.8	(0.9)	-53.9%
Transmission	14.7	9.9	(4.8)	-32.6%
Distribution & Pumping	41.1	36.6	(4.5)	-10.9%
Other	19.6	18.4	(1.3)	-6.5%
Total Waterworks System Improvements	\$77.1	\$65.6	(\$11.4)	-14.8%
Business & Operations Support	\$8.0	\$2.4	(\$5.6)	-69.8%
Total MWRA	\$178.9	\$142.9	(\$36.0)	-20.1%

Totals may not add due to rounding

FY19 Year-to-date Spending by Program:

The main reasons for the project spending variances in order of magnitude are:

Interception & Pumping: Net underspending of \$23.8 million

- \$15.0 million for Chelsea Creek Headworks Upgrades construction due to delays for odor control equipment delivery, commissioning Channel 1, and the redesign of lower roofs.
- \$5.2 million for Nut Island Odor Control and HVAC Upgrades Construction and \$0.6 million for Design CA/REI due to a delay in completion of design documents.
- \$0.9 million for Dorchester Interceptor Sewer Construction and \$0.5 million for Prison Point CSO Upgrade Construction due to schedule shifts.
- \$0.7 million for Remote Headworks and Deer Island Shaft Study due to a delay in the notice to proceed.
- \$0.6 million for Wastewater Metering Planning/Study/Design is due to police details and temporary meter work that were less than anticipated.
- \$0.4 million for Wastewater Central Monitoring Design and Programming Services, and Equipment/Hardware due to timing of work and purchases.
- \$0.3 million for Siphon Structure Design due to updated schedule and re-scoping of project.

- \$0.3 million for Prison Point Rehabilitation Design CA/REI due to additional time needed for document review.
- This underspending was partially offset by \$0.4 million for Reading Extension Sewer and \$0.3 million for Prison Point Piping Rehabilitation for FY18 scheduled work that was completed in FY19, \$0.4 million for Alewife Brook Pump Station construction due to the timing of final work, and \$0.2 million for the DeLauri Pump Station Security and Screens due to work scheduled for FY18 performed in FY19.

Other Wastewater: Net overspending of \$20.4 million

- \$20.4 million for Community I/I due to greater than budgeted requests for grants and loans.

Wastewater Treatment: Net underspending of \$11.9 million

- \$5.3 million for Clarifier Rehabilitation Phase 2 Construction and REI due to an updated schedule.
- \$4.3 million for HVAC Equipment Replacement Design, Construction, REI, and \$1.5 million for Chemical Tanks and Digester Pipe Replacement due to schedule changes and projects being re-scoped.
- \$0.8 million for Clinton Roofing Rehabilitation due to a delay in the start of work.
- \$0.3 million for Radio Repeater System Upgrade 1 and \$0.3 million for Upgrade 2 due to delayed awards due to specifications change.
- \$0.3 million for Eastern Seawall Design/ESDC due to an updated schedule.
- This underspending was partially offset by overspending of \$1.8 million for Gravity Thickener Rehabilitation due to better than anticipated contractor progress, and \$0.2 million for Clinton Phosphorus Reduction Construction for work scheduled for FY18 that was performed in FY19.

Business & Operations Support: Net underspending of \$5.6 million

- \$2.6 million for the timing of MIS initiatives, \$1.6 million for As-Needed Technical Assistance and Resident Engineering and Inspection Services due to lower than projected task order work, \$0.4 million for Security Equipment & Installation due to delay in security initiatives, \$0.4 million for Vehicle Purchases and \$0.3 million for Lab Instrumentation due to timing of purchases.

Waterworks Transmission: Net underspending of \$4.8 million

- \$2.7 million for Maintenance Garage/Wash Bay/Storage Building due to a schedule delay.
- \$1.1 million for Chestnut Hill Emergency Pumping Design/CA due to a delay in award and was awarded less than budgeted
- \$0.6 million for Tops of Shafts Design/CA/RI due to now using technical assistant contracts in lieu of design contract.
- \$0.6 million for Wachusett Aqueduct Pumping Station Design due to less than anticipated resident engineering services.
- \$0.5 million for Tunnel Redundancy Preliminary Design and Massachusetts Environmental Policy Act due to schedule change.
- \$0.4 million for WASM 3 MEPA/Design/CA/RI for test pit work that was delayed.

- \$0.4 million for Commonwealth Avenue Pumping Station Design Construction Administration/Resident Inspection and \$0.6 million for construction due to a change in the construction notice to proceed.
- This underspending was partially offset by overspending of \$1.2 million for timing of Watershed Land purchases, \$0.4 million for Rosemary Brook Siphon Building Repair due to timing of final payment, and \$0.4 million for Wachusett Pumping Station Construction due to greater than anticipated contractor progress.

Water Distribution and Pumping: Net underspending of \$4.5 million

- Underspending of \$3.9 million for Southern Extra High Redundancy Construction 3 due to a delay in notice to proceed and an issue with MBTA crossing.
- \$0.7 million for Section 23, 24, 47 Final Design CA/RI due to a delayed gas line relocation.
- \$0.7 million for Peabody Pipeline Design/ESDC and \$1.6 million for Construction due to contract not moving forward.
- \$0.4 million for Sections 53 and 99 Replacement Design and \$0.2 million for Section 56 Replacement Saugus Design due to schedule changes.
- \$0.2 million for Section 14 Water Main Relocation (Malden) due to FY19 scheduled work that was completed in FY18.
- This underspending was partially offset by overspending of \$1.0 million for Southern Extra High (SEH) Section 111 Construction 2, \$0.2 million for Construction 1, \$0.9 million for Section 56 Pipe Demolition, \$0.7 million for Northern Intermediate High (NIH) Section 89 & 29 Phase 2, \$0.4 million for Phase 1C, \$0.1 million for Phase 1B, \$0.3 million for Cathodic Protection Shafts E & L due to better than anticipated contractor progress, \$0.2 million for NIH Section 89 & 29 Redundancy Design CA/RI and \$0.1 million for Section 50/57 Water and Sections 21/20/10 Sewer Design ESDC/REI due to the consultant's progress.

Residuals: Net underspending of \$2.3 million

- Underspending of \$1.9 million for Electrical and Mechanical Improvements due to a delay in award as a result of combining electrical and mechanical contracts and adding drum dryer replacements to scope of work, \$0.6 million for Pellet Conveyance Piping Relocation due to a schedule change, partially offset by \$0.1 million for Sludge Tank and Silo Coating due to work scheduled for FY18 completed in FY19.

Combined Sewer Overflow: Net underspending of \$1.4 million

- \$1.4 million for Somerville Marginal In-System Storage due to the delay of the design and construction awards by the City of Somerville.

Other Waterworks: Net underspending of \$1.3 million

- 3.2 million for Deer Island Water Tank Painting due to a delay in the notice to proceed and the contract awarded less than budgeted, \$2.4 million for Bellevue 2 and Turkey Hill Painting/Improvements contract being awarded less than budgeted, additional structural repairs needed and antenna relocation delays, \$0.4 million for a delay in the start of work for the Cosgrove Intake Roof Repair, \$0.4 million for the Generator Docking Station contract due to a delay in the award and long lead time for equipment, \$0.3 million for

Gillis Pumping Station/Cottage Farm Roof Replacement and \$0.3 million for Steel Tank Improvements Design/CA due to updated schedules.

- This underspending was partially offset by \$5.5 million for the Local Water System Assistance Program due to greater than anticipated loan requests.

Drinking Water Quality Improvements: Net underspending of \$0.9 million

- \$0.6 million for timing of task order work and \$0.3 million primarily due to an updated schedule for Cosgrove Boat Storage work.

Construction Fund Balance

The construction fund balance was \$188.8 million as of the end of June. Commercial Paper/Revolving Loan availability was \$222 million to fund construction projects.

ATTACHMENTS:

Attachment 1 – Variance Summary June 2019

Attachment 2 – Current Expense Variance Explanations

Attachment 3 – Capital Improvement Program Variance Explanations

Attachment 4 –FY19 Actuals vs. FY19 Projections

ATTACHMENT 1
FY19 Actuals vs. FY19 Budget

	June 2019 Year-to-Date				
	Period 12 YTD Budget	Period 12 YTD Actual	Period 12 YTD Variance	%	FY19 Approved
<u>EXPENSES</u>					
WAGES AND SALARIES	\$ 107,032,021	\$ 102,331,904	\$ (4,700,117)	-4.4%	\$ 107,032,021
OVERTIME	4,447,554	5,208,556	761,002	17.1%	4,447,554
FRINGE BENEFITS	21,173,571	19,982,221	(1,191,350)	-5.6%	21,173,571
WORKERS' COMPENSATION	2,422,609	2,717,568	294,959	12.2%	2,422,609
CHEMICALS	10,830,452	10,891,948	61,496	0.6%	10,830,452
ENERGY AND UTILITIES	22,868,632	24,446,278	1,577,646	6.9%	22,868,632
MAINTENANCE	32,258,727	30,650,570	(1,608,157)	-5.0%	32,258,727
TRAINING AND MEETINGS	455,770	499,836	44,066	9.7%	455,770
PROFESSIONAL SERVICES	7,675,976	6,194,703	(1,481,273)	-19.3%	7,675,976
OTHER MATERIALS	7,381,098	6,987,854	(393,244)	-5.3%	7,381,098
OTHER SERVICES	23,065,411	23,769,299	703,888	3.1%	23,065,411
TOTAL DIRECT EXPENSES	\$ 239,611,821	\$ 233,680,737	\$ (5,931,085)	-2.5%	\$ 239,611,821
INSURANCE	\$ 2,099,064	\$ 2,748,983	\$ 649,919	31.0%	\$ 2,099,064
WATERSHED/PILOT	26,406,427	23,411,908	(2,994,519)	-11.3%	26,406,427
HEEC PAYMENT	1,386,832	1,191,990	(194,842)	-14.0%	1,386,832
MITIGATION	1,614,263	1,614,263	-	0.0%	1,614,263
ADDITIONS TO RESERVES	1,881,797	1,881,797	-	0.0%	1,881,797
RETIREMENT FUND	7,000,000	7,000,000	-	0.0%	7,000,000
POST EMPLOYEE BENEFITS	5,574,152	5,574,152	-	0.0%	5,574,152
TOTAL INDIRECT EXPENSES	\$ 45,962,534	\$ 43,423,093	\$ (2,539,441)	-5.5%	\$ 45,962,534
STATE REVOLVING FUND	\$ 89,380,363	\$ 84,227,800	\$ (5,152,563)	-5.8%	\$ 89,380,363
SENIOR DEBT	272,633,982	287,497,793	14,863,811	5.5%	272,633,982
DEBT SERVICE ASSISTANCE	(944,726)	(1,834,965)	(890,239)	94.2%	(944,726)
CURRENT REVENUE/CAPITAL	14,200,000	14,200,000	-	0.0%	14,199,991
SUBORDINATE MWRA DEBT	92,032,293	92,032,293	-	0.0%	92,032,292
LOCAL WATER PIPELINE CP	4,750,396	2,540,172	(2,210,224)	-46.5%	4,750,396
CAPITAL LEASE	3,217,060	3,217,060	-	0.0%	3,217,060
DEBT PREPAYMENT	7,100,000	7,100,000	-	0.0%	7,100,000
VARIABLE DEBT	-	(7,243,421)	(7,243,421)	---	-
DEFEASANCE ACCOUNT	-	-	-	---	-
TOTAL DEBT SERVICE	\$ 482,369,358	\$ 481,736,732	\$ (632,626)	-0.1%	\$ 482,369,358
TOTAL EXPENSES	\$ 767,943,713	\$ 758,840,562	\$ (9,103,152)	-1.2%	\$ 767,943,713
<u>REVENUE & INCOME</u>					
RATE REVENUE	\$ 739,042,200	\$ 739,042,200	\$ -	0.0%	\$ 739,042,200
OTHER USER CHARGES	9,328,768	9,346,469	17,701	0.2%	9,328,768
OTHER REVENUE	6,013,635	6,947,076	933,441	15.5%	6,013,635
RATE STABILIZATION	-	-	-	---	-
INVESTMENT INCOME	13,559,110	16,985,523	3,426,413	25.3%	13,559,110
TOTAL REVENUE & INCOME	\$ 767,943,713	\$ 772,321,268	\$ 4,377,555	0.6%	

ATTACHMENT 2
Current Expense Variance Explanations

Total MWRA	FY19 Budget YTD June	FY19 Actuals YTD June	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
Direct Expenses					
Wages & Salaries	107,032,021	102,331,904	(4,700,117)	-4.4%	Wages and Salaries are under budget by \$4.7 million. Year to date, there have been 19 fewer average FTEs (1,136 versus 1,155 budget), lower average new hire salaries versus retirees, the timing of backfilling vacant positions, and lower leave balance accruals contributed to Regular Pay being under budget.
Overtime	4,447,554	5,208,556	761,002	17.1%	Higher spending mainly in Wastewater Operations for wet weather events.
Fringe Benefits	21,173,571	19,982,221	(1,191,351)	-5.6%	Lower than budget mainly in Health Insurance of \$1.1 million, due to fewer than budgeted participants in health insurance plans, increased contribution by external new hires vs. lower contribution rates of staff retiring, and the shift from family to individual plans which are less expensive.
Worker's Compensation	2,422,609	2,717,568	294,959	12.2%	The higher expenses were due to unfavorable variances in Compensation Payments of \$349,000 and Medical Payments of \$8,000, offset by a favorable variance in Administrative Expenses of \$62,000. Due to uncertainties of when spending will happen, the budget is spread evenly throughout the year.

**ATTACHMENT 2
Current Expense Variance Explanations**

Total MWRA	FY19 Budget YTD June	FY19 Actuals YTD June	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
Chemicals	10,830,452	10,891,948	61,496	0.6%	Overspending on Ferric Chloride of \$339,000 at DITP and Clinton and Sodium Hypochlorite of \$256,000 at DITP & Wastewater Ops due to wet weather, and at CWTP due to rainy fiscal year, we have been using more water from Wachusett Reservoir vs. the higher quality water from Quabbin Reservoir, which has required higher dosing to disinfect the water. This is offset by underspending in Soda Ash of \$417,000 at CWTP and Clinton and Hydrogen Peroxide of \$128,000 at DITP. DITP flows are 7.5% higher than the budget and CWTP flows are 4.8% less than the budget through June. It is important to note that Chemicals variances are also based on deliveries which in general reflect the usage patterns. However, the timing of deliveries is an important factor.
Utilities	22,868,632	24,446,278	1,577,646	6.9%	Overspending in Electricity of \$1.4 million primarily at DITP (\$890,000) and Field Operatoins (\$457,000) due to pricing; Diesel Fuel of \$199,000 primarily at DI (\$261,000) due to timing of deliveries.

**ATTACHMENT 2
Current Expense Variance Explanations**

Total MWRA	FY19 Budget YTD June	FY19 Actuals YTD June	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
Maintenance	32,258,727	30,650,570	(1,608,158)	-5.0%	<p>Services were underspent by \$985,000 and Materials were underspent by \$624,000.</p> <p>Services : Underspending in Building and Grounds Services of \$1.0 million driven by Field Operations (\$1.2 million) and offset by overspending at Deer Island (\$226,000); Electrical Services of \$406,000 driven by Deer Island (\$235,000) and Field Operations (\$210,000); and Pipe Services of \$368,000 driven by Metro Maintenance (\$338,000). These are offset by overspending in P&M Services of \$915,000 driven by Deer Island (\$514,000) and Field Operations (\$377,000).</p> <p>Materials : Underspending in P&M Materials of \$587,000 driven by Deer Island (\$407,000) and Field Operations (\$262,000); and Electrical Materials of \$321,000 driven by Deer Island (\$208,000) and Field Operations (\$118,000). These are offset by overspending in Special Equipment Materials of \$194,000 driven by Metro Maintenance (\$253,000) and Building and Grounds Materials of \$95,000 driven by Deer Island (\$117,000).</p>
Training & Meetings	455,770	499,836	44,066	9.7%	Driven by overspending in Field Operations (\$40,000).
Professional Services	7,675,976	6,194,703	(1,481,273)	-19.3%	Underspending in Other Professional Services of \$569,000 in HR for Training and the Pay Equity Study, Law, Operations, and Finance; Legal Services of \$305,000 in Law and HR; Engineering Services of \$224,000 primarily for SCADA project delays due to staffing/resources, Reservoir Ops for timing of dam asset maintenance plans, and DITP for timing of study of biosolids exemptions for MWRA pellets as relative to MDAR regulations; Lab & Testing Analysis of \$216,000 in EnQual Wastewater and Lab Services; and Computer System Consultants of \$155,000 in MIS.


**ATTACHMENT 2
Current Expense Variance Explanations**

Total MWRA	FY19 Budget YTD June	FY19 Actuals YTD June	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
Other Materials	7,381,098	6,987,854	(393,244)	-5.3%	Lower than budgeted spending in Vehicles of \$293,000 is driven by the shift of two vehicle purchases to the CIP (from the CEB where they were initially budgeted) due to the prices being greater than the \$100,000 capitalization threshold, as well as vehicle pricing being lower than expected; and Equipment/Furniture of \$250,000 in Operations for timing of water quality equipment and furniture at DITP. This is offset by higher than budgeted spending in Computer Hardware of \$140,000 in MIS.
Other Services	23,065,411	23,769,299	703,888	3.1%	Higher than budgeted spending for Sludge Pelletization of \$1.2 million due to higher year-to-date quantities. This is offset by lower spending for Telephone/Data Services of \$311,000 in MIS and FOD, and Other Services of \$242,000 for a number of services, including the timing of Technical Assistance for Lead issues in Planning; the switch from renting modems to purchasing them for the Contaminant Monitoring System in Water Quality Assurance; and remediation projects managed by Real Property/Environmental Management; and .
Total Direct Expenses	239,611,821	233,680,737	(5,931,085)	-2.5%	

ATTACHMENT 2
Current Expense Variance Explanations

Total MWRA	FY19 Budget YTD June	FY19 Actuals YTD June	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
<u>Indirect Expenses</u>					
Insurance	2,099,064	2,748,983	649,919	31.0%	Higher claims than budgeted of \$737,000, offset by lower premiums of \$87,000.
Watershed/PILOT	26,406,427	23,411,908	(2,994,519)	-11.3%	Lower Watershed Reimbursement of \$3.0 million due to lower reimburseable costs in FY19 associated with compensation and benefits, capital projects, and PILOT payments.
HEEC Payment	1,386,832	1,191,990	(194,842)	-14.0%	Lower than budgeted spending on special projects related to the HEEC cable.
Mitigation	1,614,262	1,614,263	1	0.0%	
Addition to Reserves	1,881,797	1,881,797	-	0.0%	
Pension Expense	7,000,000	7,000,000	-	0.0%	
Post Employee Benefits	5,574,152	5,574,152	-	0.0%	
Total Indirect Expenses	45,962,534	43,423,093	(2,539,441)	-5.5%	
<u>Debt Service</u>					
Debt Service	483,314,084	483,571,697	257,613	0.1%	Debt Service was over budget by \$257,613 as a result of \$17.1 million spent to execute a defeasance in June 2019, offset by lower than budgeted variable interest rates, refunding savings and lower than expected debt service on the SRF and new money transactions.
Debt Service Assistance	(944,726)	(1,834,965)	(890,239)	94.2%	
Total Debt Service Expenses	482,369,358	481,736,732	(632,626)	-0.1%	
Total Expenses	767,943,713	758,840,562	(9,103,152)	-1.2%	

**ATTACHMENT 2
Current Expense Variance Explanations**

Total MWRA	FY19 Budget YTD June	FY19 Actuals YTD June	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
Revenue & Income					
Rate Revenue	739,042,200	739,042,200	-	0.0%	
Other User Charges	9,328,768	9,346,469	17,701	0.2%	
Other Revenue	6,013,635	6,947,076	933,441	15.5%	\$428,000 for disposal of surplus materials; Miscellaneous Revenue of \$209,000 primarily associated with worker's compensation reimbursement for older claims; and \$195,000 for Emergency Water Surcharges for the town of Burlington.
Investment Income	13,559,110	16,985,523	3,426,413	25.3%	Investment Income is over budget mostly due to short term rates higher than budget (2.45% vs.1.75% budget).
Total Revenue	767,943,713	772,321,268	4,377,555	0.6%	
Net Revenue in Excess of Expenses	-	13,480,708	13,480,708		

**Totals may not add up due to rounding*

**ATTACHMENT 3
FY19 CIP Year-to-Date Variance Report (\$000's)**

	FY19 Budget YTD June	FY19 Actuals YTD June	YTD Actuals vs. Budget		Explanations
			\$	%	
Wastewater					
Interception & Pumping (I&P)	\$46,925	\$23,147	(\$23,778)	-50.7%	<p><u>Underspending</u> Chelsea Creek Headworks Upgrades - Construction and REI: \$15.2M (due to timing of odor control equipment delivery, delay in commissioning channel 1 and redesign of lower roofs) Nut Island Odor Control & HVAC Design/CA/REI and Construction : \$5.7M (delay in completion of design documents) Interceptor Renewal 3, Dorchester Interceptor Sewer - Construction: \$930k, Remote Headworks & Deer Island Shaft Study: \$718k, Prison Point Rehab - Construction: \$465k, Siphon Structure Rehabilitation Design/CS/RI: \$268k and Sections 4, 5, 6, 186 - Design CA/RI: \$186k (schedule shifts) Wastewater Meter System Planning/Study/Design: \$634k (police details and temporary meter work less than anticipated) Wastewater Central Monitoring Design and Programming Services, and Equipment/Hardware: \$432k (timing of work and purchases) Meter Modems-Antenna Replacement: \$300k (project to be completed through CEB) Wiggins Terminal Pump Station Design: \$199k (work to be performed through task order consultant services) Sections 4, 5, 6, 186 - Study: \$114k (work completed in FY18)</p> <p><u>Offset Overspending</u> Alewife Brook Pump Station Rehab - Construction and CA/REI: \$501k (due to timing of final work) Interceptor Renewal 1, Reading Extension Sewer - Construction: \$428k, Prison Point Piping Rehabilitation: \$262k and DeLauri Pump Station Screens & Security Upgrades: \$209k (work scheduled for FY18 performed in FY19)</p>

**ATTACHMENT 3
FY19 CIP Year-to-Date Variance Report (\$000's)**

	FY19 Budget YTD June	FY19 Actuals YTD June	YTD Actuals vs. Budget		Explanations
			\$	%	
Treatment	\$21,895	\$10,024	(\$11,870)	-54.2%	<u>Underspending</u> Clarifier Rehabilitation Phase 2 - Construction and REI: \$5.3M (delayed due to schedule shift) HVAC Equipment Replacement - Design, Construction and REI: \$4.3M (contract being re-scoped) Chemical Tank Relining & Pipe Replacement: \$1.5M (project scope combined with Gravity Thickener Overflow Piping project and schedule shift) Clinton Roofing Rehabilitation: \$839k (schedule shift and delay in start of work) Radio Repeater System Upgrades - Phase 1 & 2: \$563k (award delayed and specifications changed) Eastern Seawall Design/ESDC/REI: \$341k (schedule shift) Gas Protection System Replacement Phase 1: \$215k (schedule shift) <u>Offset Overspending</u> Gravity Thickener Rehab: \$1.8M (contractor progress) Phosphorus Removal - Construction: \$170k (work scheduled for FY18 performed in FY19)
Residuals	\$3,179	\$833	(\$2,345)	-73.8%	<u>Underspending</u> Electrical Improvements \$1.3M and Mechanical Improvements \$656k (scope of work incorporated into Electrical, Mechanical, & Drum Replacements contract and schedule shift) Pellet Piping Relocation: \$550K (schedule shift) <u>Offset Overspending</u> Sludge Tank & Silo Coating: \$115k (due to work scheduled for FY18 completed in FY19)
CSO	\$2,598	\$1,196	(\$1,402)	-54.0%	<u>Underspending</u> Somerville Marginal In-System Storage: \$1.4M (shift in Somerville design and construction schedule)
Other Wastewater	\$19,206	\$39,649	\$20,443	106.4%	<u>Overspending</u> I/I Local Financial Assistance: \$20.4M (greater than budgeted requests for grants and loans)
Total Wastewater	\$93,803	\$74,850	(\$18,953)	-20.2%	

**ATTACHMENT 3
FY19 CIP Year-to-Date Variance Report (\$000's)**

	FY19 Budget YTD June	FY19 Actuals YTD June	YTD Actuals vs. Budget		Explanations
			\$	%	
Waterworks					
Drinking Water Quality Improvements	\$1,669	\$770	(\$899)	-53.9%	<u>Underspending</u> Technical Assistance: \$633k (timing of task order work) Existing Facilities Modifications - CP 7: \$276k (updated schedule for Cosgrove Boat Storage work)
Transmission	\$14,712	\$9,914	(\$4,798)	-32.6%	<u>Underspending</u> Maintenance Garage/Wash Bay/Storage Building: \$2.7M (schedule shift) Chestnut Hill Emergency Pump Station Improvements - Design/CA/RI: \$1.1M (delay in award) Metropolitan Redundancy Interim Improvements Tops of Shaft Design/CA/RI: \$600k (design to be completed under existing Technical Assistance contract) Commonwealth Avenue Pump Station Improvements - Design/CA/RI: \$379k and Construction: \$594k (CA & RI services delayed as a result of change in construction notice to proceed) Wachusett Aqueduct Pump Station - Design/ESDC/RI: \$562k (less than anticipated resident engineering services) Metropolitan Tunnel Redundancy Preliminary Design & MEPA Review: \$500k (schedule shift) WASM 3 - MEPA/Design/CA/RI: \$390k (test pits work delayed) <u>Offset Overspending</u> Watershed Land Acquisition: \$1.2M (timing of land purchases) Wachusett Aqueduct Pump Station - Construction: \$447k (due to project progress) Rosemary Brook Siphon Building Repair: \$386k (timing of final payment) Metropolitan Tunnel Redundancy Program Support Services: \$247k (contract established and awarded prior to Preliminary Design)

**ATTACHMENT 3
FY19 CIP Year-to-Date Variance Report (\$000's)**

	FY19 Budget YTD June	FY19 Actuals YTD June	YTD Actuals vs. Budget		Explanations
			\$	%	
Distribution & Pumping	\$41,074	\$36,603	(\$4,471)	-10.9%	<u>Underspending</u> SEH Redundancy Pipeline Section 111 - Construction Phase 3: \$3.9M (due to delay in notice to proceed and issue with MBTA crossing) Peabody Pipeline Project: \$2.3M (project cancelled) New Connecting Mains CP3 (Sect 23,24,47) - Final Design/CA/RI: \$749k (delayed utility relocation) Sections 53 and 99 Connections - Design/CA/RI: \$443k and Section 56 Replacement/Saugus Design/CA/RI: \$200k (schedule shifts) Section 14 Water Pipe Relocation (Malden): \$180k (work scheduled for FY19 performed in FY18) <u>Offset Overspending</u> NHS - Revere & Malden Pipeline Section 56 Pipe Demolition - Construction: \$949k, NIH Section 89 and 29 Redundancy - Construction Phase 2: \$653k, Construction Phase 1B and 1C: \$556k, and Design: \$184k, SEH Redundancy Pipeline Section 111 - Construction Phase 1 & 2: \$1.2M, Cathodic Protection of Shafts E & L: \$255K, and Sections 50 & 57 Water & 21/20/19 Sewer Rehab - Design/CA/RI: \$125k (all due to project progress)
Other Waterworks	\$19,630	\$18,359	(\$1,270)	-6.5%	<u>Underspending</u> Deer Island Water Tank Repainting : \$3.2M: Delay in notice to proceed and contract award less than budgeted) Bellevue II & Turkey Hill Water Tanks Repainting: \$2.4M (award less than budgeted and additional structural repairs and antenna relocation delays) Generator Docking Station: \$382k (delay in the award and long lead time for equipment) Cosgrove Intake Roof Replacement: \$365k (delay in start of work) Gillis Pump Station/Cottage Farm CSO Facility Roof Replacements: \$280k and Steel Tank Improvements - Design/CA/RI: \$273k (all due to schedule shifts) <u>Offset Overspending</u> Local Water Pipeline Financial Assistance Program: \$5.5M (greater than budgeted requests for loans), and Carroll Water Treatment Plant SCADA Upgrades - Design/Programming RE services: \$157K (consultant progress)
Total Waterworks	\$77,085	\$65,647	(\$11,438)	-14.8%	


**ATTACHMENT 3
FY19 CIP Year-to-Date Variance Report (\$000's)**

	FY19 Budget YTD June	FY19 Actuals YTD June	YTD Actuals vs. Budget		Explanations
			\$	%	
Business & Operations Support					
Total Business & Operations Support	\$7,968	\$2,408	(\$5,560)	-69.8%	<u>Underspending</u> MIS Projects: \$2.6M (due to timing of work) As-Needed Technical Assistance: \$1.6M (due to timing of task order work) Security Equipment & Installation: \$404k, FY19-23 Vehicle Purchases: \$396k and Major Lab Instrumentation: \$250k (timing of purchases)
Total MWRA	\$178,856	\$142,904	(\$35,951)	-20.1%	

ATTACHMENT 4
FY19 Actuals versus FY19 Year-End Projections



TOTAL MWRA	FY19 Projection	FY19 Actual	Change FY19 Actual vs. FY19 Projection	
			\$	%
EXPENSES				
WAGES AND SALARIES	\$ 101,960,858	\$ 102,331,904	\$ 371,047	0.4%
OVERTIME	5,079,147	5,208,556	129,409	2.5%
FRINGE BENEFITS	20,256,723	19,982,221	(274,502)	-1.4%
WORKERS' COMPENSATION	2,422,609	2,717,568	294,959	12.2%
CHEMICALS	10,942,534	10,891,948	(50,586)	-0.5%
ENERGY AND UTILITIES	24,491,122	24,446,278	(44,844)	-0.2%
MAINTENANCE	31,619,639	30,650,570	(969,069)	-3.1%
TRAINING AND MEETINGS	484,135	499,836	15,701	3.2%
PROFESSIONAL SERVICES	6,952,719	6,194,703	(758,016)	-10.9%
OTHER MATERIALS	6,969,797	6,987,854	18,057	0.3%
OTHER SERVICES	23,952,108	23,769,299	(182,809)	-0.8%
TOTAL DIRECT EXPENSES	\$ 235,131,392	\$ 233,680,737	\$ (1,450,655)	-0.6%
INSURANCE	\$ 2,967,643	\$ 2,748,983	\$ (218,660)	-7.4%
WATERSHED/PILOT	23,695,654	23,411,908	(283,745)	-1.2%
HEEC PAYMENT	1,203,255	1,191,990	(11,265)	-0.9%
MITIGATION	1,614,263	1,614,263	-	0.0%
ADDITIONS TO RESERVES	1,881,797	1,881,797	-	0.0%
RETIREMENT FUND	7,000,000	7,000,000	-	0.0%
POSTEMPLOYMENT BENEFITS	5,574,152	5,574,152	-	0.0%
TOTAL INDIRECT EXPENSES	\$ 43,936,764	\$ 43,423,093	\$ (513,670)	-1.2%
DEBT SERVICE				
STATE REVOLVING FUND (SRF)	\$ 84,227,800	84,227,800	\$ -	0.0%
SENIOR DEBT	270,379,599	287,497,793	17,118,194	6.3%
SUBORDINATE DEBT	92,032,293	92,032,293	-	0.0%
LOCAL WATER PIPELINE CP	2,504,172	2,540,172	36,000	1.4%
CAPITAL LEASE	3,217,060	3,217,060	-	0.0%
CURRENT REVENUE FOR CAPITAL	14,200,000	14,200,000	-	0.0%
DEBT PREPAYMENT	7,100,000	7,100,000	-	0.0%
VARIABLE RATE DEBT	(7,324,342)	(7,243,421)	80,921	-1.1%
DEBT SERVICE ASSISTANCE	(1,834,965)	(1,834,965)	-	0.0%
DEFEASANCE	17,118,194	-	(17,118,194)	-100.0%
TOTAL DEBT SERVICE	\$ 481,619,811	\$ 481,736,731	\$ 116,920	0.0%
TOTAL EXPENSES	\$ 760,687,967	\$ 758,840,561	\$ (1,847,405)	-0.2%
REVENUE & INCOME				
RATE REVENUE	\$ 739,042,200	\$ 739,042,200	\$ -	0.0%
OTHER USER CHARGES	9,328,768	9,346,469	17,701	0.2%
OTHER REVENUE	6,544,796	6,947,076	402,280	6.1%
RATE STABILIZATION	-	-	-	-
INVESTMENT INCOME	16,759,110	16,985,523	226,413	1.4%
TOTAL REVENUE & INCOME	\$ 771,674,874	\$ 772,321,268	\$ 646,394	0.1%
SURPLUS AFTER DEFEASANCE	\$ 10,986,907	\$ 13,480,708	\$ 2,493,799	22.7%

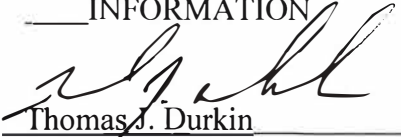
STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: September 18, 2019
SUBJECT: Bond Defeasance of Future Debt Service

COMMITTEE: Administration, Finance & Audit

VOTE
 INFORMATION

Matthew R. Horan, Treasurer 
Sean R. Cordy, Sr. Financial Analyst 
Preparer/Title


Thomas J. Durkin
Director of Finance

Consistent with MWRA's multi-year rates management strategy, MWRA staff are recommending the execution of an approximately \$10.6 million defeasance to reduce future year rate increases. The \$10.6 million in available funds is derived from the FY19 surplus after \$17.1 million was utilized to execute a defeasance in June 2019. These funds will be used to prepay debt service coming due in FY21 through FY23 (\$10.1 million in principal and \$436,250 in interest). The defeasance of debt, coupled with diligent management of operational expenses, have been the keys to MWRA's ability to keep assessment increases sustainable and predictable.

RECOMMENDATION:

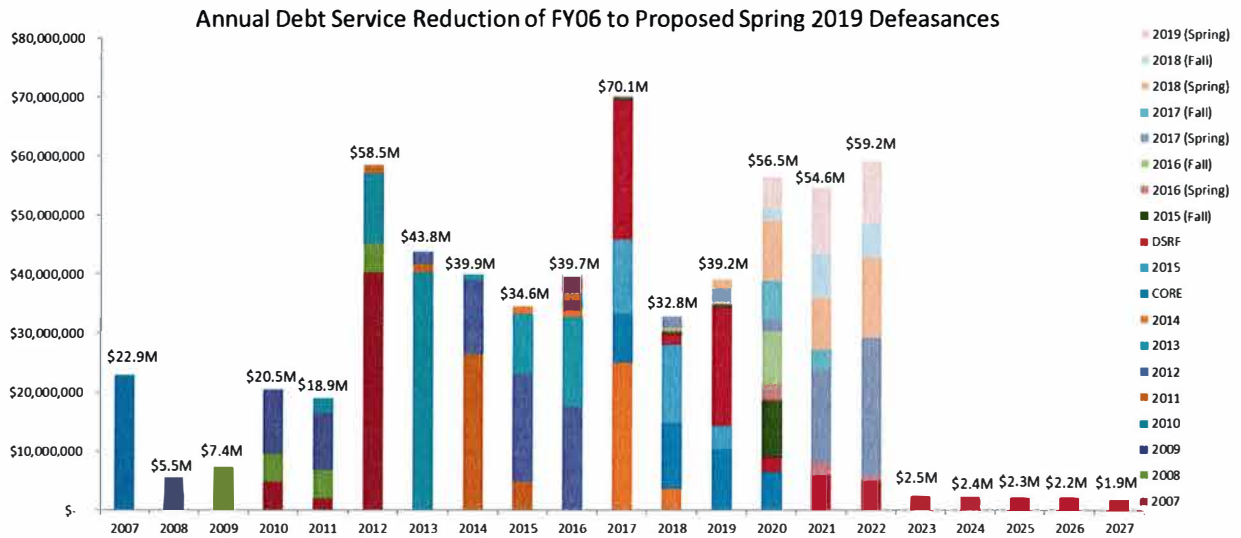
To authorize the Executive Director or his designee, on behalf of the Authority, to enter into, execute and deliver all necessary agreements and other instruments and to take such other actions necessary to effectuate the redemption and defeasance of an aggregate principal amount of \$10,115,000 of outstanding MWRA senior bonds including to cause the escrow of cash and/or securities in an amount necessary to fund such redemption and defeasance, in order to reduce the debt service requirement by \$11,482,250 in the FY21 through FY23 timeframe.

DISCUSSION:

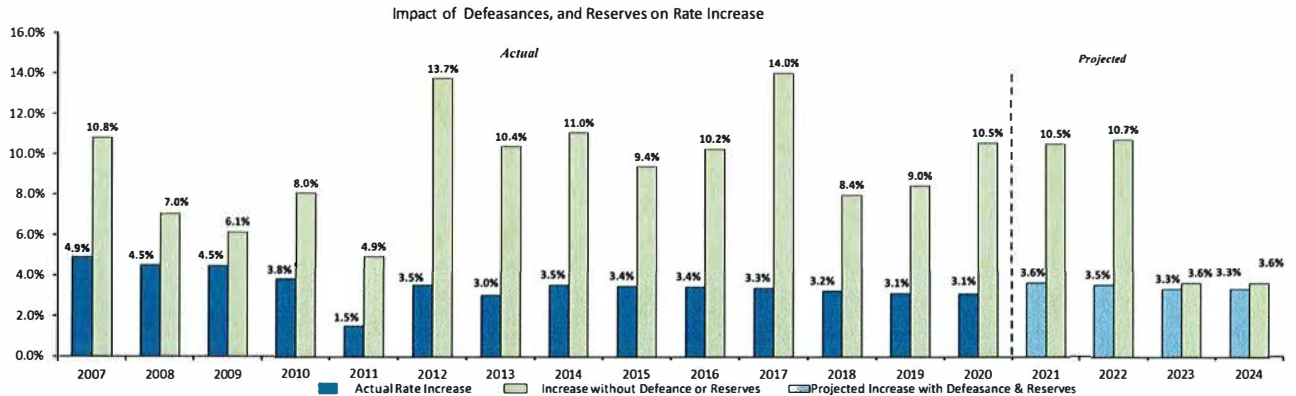
As described in more detail in the FY19 Year-end Financial Update and Summary presented at this meeting, MWRA has approximately \$10.6 million available from the FY19 budget to execute a defeasance of outstanding debt. These funds are available after the use of approximately \$7.1 million from the budgeted FY19 Optional Debt Prepayment and approximately \$17.1 million from the FY19 surplus to defease \$24.2 million in outstanding principal executed in June 2019.

MWRA's ongoing use of defeasances has had a significant impact in lowering future debt service payments and limiting annual rate revenue increases. From 2006 through this proposed

transaction, MWRA has defeased \$625.1 million in debt service to reduce future year rate revenue requirements. The following chart details the multi-year impact of those defeasances.



The application of these defeasances has had a significant impact on rate increases. The chart below shows the estimated rate increase without the application of the defeasances.



Staff reviewed all bonds available to be defeased, and have identified the maturities of the bonds in the following table as the most advantageous defeasance candidates.

Series	Maturity	Call Date	Principal	Defeasance Cost ¹
2011C	August 1, 2022	August 1, 2021	\$ 3,000,000	\$ 3,150,000
2011C	August 1, 2023	August 1, 2021	\$ 5,725,000	\$ 6,011,250
2017B	August 1, 2023	August 1, 2020	\$ 1,390,000	\$ 1,390,000
Total			\$ 10,115,000	\$ 10,551,250

(1) Defeasance costs is only anticipated funds from surplus and does not included current year deposits. Assumes no interest earned on escrow

The following table details the annual budget savings by fiscal year for the proposed FY20 fall defeasance.

Budget Reduction by Fiscal Year			Total CEB Savings
2021	2022	2023	
\$ 505,750	\$ 3,505,750	\$ 7,470,750	\$ 11,482,250

The proposed defeasance reduces debt service by a total of \$11.5 million between FY21 and FY23. The total debt service reduction attributable to the defeasance is approximately \$931,000 higher than the defeasance cost because both the 2011 Series C and 2017 Series B bonds are callable prior to their maturity date. The payment of these bonds on the call date will yield interest savings, as a result of paying off the bonds prior to maturity without interest accruing. Since 2006, MWRA has avoided \$35.1 million in interest by defeasing callable bonds.

The funds will be utilized to purchase governmental securities in an amount sufficient to make all future interest and principal payments on the bonds to be defeased, offset by the interest earned on the securities.

The governmental securities purchased will be deposited with an escrow agent (bond trustee). Once established, an escrow is irrevocable, replacing any future debt service payments due for the bonds being escrowed, and therefore reducing the rate revenue requirement. Establishing an escrow reduces debt service requirements for each fiscal year from the time it is executed until the defeased bonds mature.

Establishing an escrow to defease debt requires that MWRA’s bond counsel draft an agreement to this effect and an independent verification agent must certify that the funds in the escrow are sufficient to pay the remaining debt service. Bonds that are escrowed to maturity are not included in the MWRA’s debt cap or debt service coverage calculations. Staff will continue to monitor market conditions and the maturities available to be defeased to ensure that the bonds selected provide MWRA with the highest available debt service savings.

BUDGET/FISCAL IMPACT:

The defeasance of these bonds will decrease the FY21 through FY23 debt service requirement by \$11.5 million. The cost associated with bond counsel and financial advisory services will be paid out of the Treasury Department’s professional services budget.



STAFF SUMMARY


TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Approval of the Eighty-First Supplemental Resolution



COMMITTEE: Administration, Finance & Audit

X VOTE
INFORMATION

Matthew R. Horan, Treasurer 
Sean R. Cordy, Sr. Financial Analyst 
Preparer/Title


Thomas J. Durkin
Director of Finance

RECOMMENDATION:

To adopt the Eighty-First Supplemental Resolution authorizing the issuance of up to \$625,000,000 of Massachusetts Water Resources Authority Taxable and Tax-Exempt General Revenue Bonds and General Revenue Refunding Bonds and the supporting Issuance Resolution.

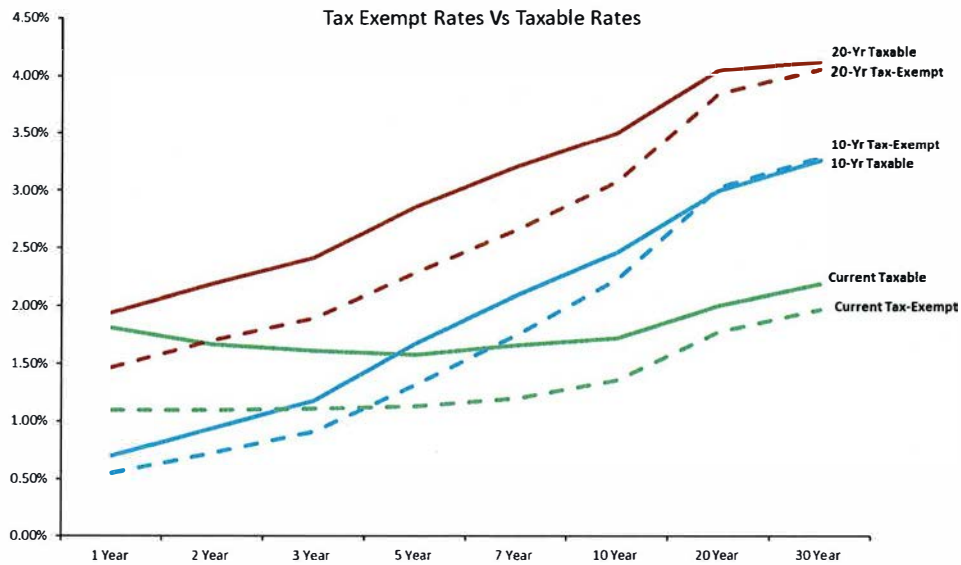
DISCUSSION:

The bonds to be issued under this authorization will include approximately \$600 million in taxable bonds and \$25 million in tax-exempt debt. The taxable bonds are comprised of \$50 million in new money and \$550 million in advance refunding bonds. The \$25 million in tax-exempt bonds will be used to complete a current refunding of the 2002 Series C bonds. The following table provides a breakdown of the components of the proposed transaction.

Bond Type	Proposed Issuance Amount
Taxable Refunding	\$ 550,000,000
Taxable New Money	\$ 50,000,000
Tax-Exempt Refunding	\$ 25,000,000
Total Authorization	\$ 625,000,000

Over the last several months, global market conditions have resulted in downward pressure on long-term interest rates in the tax-exempt and taxable markets. The compression in the taxable and tax-exempt markets have resulted in historically low yields including the lowest 30-year U.S. Treasury Security rate ever recorded. In addition to lower rates, the overall compression has resulted in tightening of the spread between tax-exempt and taxable interest rates. In general, taxable interest rates are higher than tax-exempt rates because the bondholder wants compensation for paying taxes on the interest earnings. While the ratio would be different for each taxpayer, the market overall recognizes that tax-exempt rates should be approximately 67% of the taxable rate. Currently the ratio ranges from 61% for the one year to 90% in year 30. As a result investors are willing to take a 10% tax margin as opposed to the traditional 33% on longer-term debt. In addition to the lower long-term rates, the high short-term rates allow MWRA to receive greater earnings on

the investment that comprise the refunding escrow making the transaction more efficient. The following graph details the current tax-exempt and taxable rates compared to their respective ten and twenty year averages.



Prior to the passage of the Tax Reform and Jobs Act of 2017, MWRA would have utilized tax-exempt bonds to complete an advance refunding for interest rate savings. Unfortunately, the 2017 Act eliminated the ability to use tax-exempt debt to advance refund outstanding tax-exempt bonds. As a result, the use of tax-exempt debt for refundings is limited to current refundings, which limits the new debt issuance to within 90-days of the call date of the outstanding bonds. The advance refunding restriction does not apply to taxable bonds.

Due to the market conditions discussed above, MWRA has the opportunity to execute a taxable advance refunding for interest rate savings. Staff utilized MWRA’s debt policy’s parameters when reviewing candidates for a refunding for interest rate savings. The criteria are as follows:

- overall savings has a present value of 4.0% or greater;
- individual maturities have a 3% present value savings or an option value above 70%; and
- the efficiency of the escrow is greater than 50%.

In addition to these criteria, bonds may be refunded or restructured to meet particular organizational and/or strategic needs when it is advantageous to do so. All refunding transactions require the approval of the Board of Directors. Based on current taxable interest rates, the following bonds meet MWRA’s refunding criteria.

Series	Principal to be Refunded	Call Date
2010 Series B	\$ 66,870,000	August 1, 2020
2011 Series B	\$ 840,000	August 1, 2021
2011 Series C	\$ 282,435,000	August 1, 2021
2012 Series A	\$ 68,800,000	August 1, 2022
2012 Series B	\$ 86,775,000	August 1, 2022
Total	\$ 505,720,000	

The difference between the \$505.7 million in principal to potentially be refunded and the \$550 million in authorization is related to the interest cost for the period between retirement of the old bonds and the issuance date. Current market conditions result in \$84.0 million in budgetary savings with \$66.7 million or 13.2% in present value savings for the bonds listed above. The table to the right details the taxable refunding savings by fiscal year.

Fiscal Year	Prior Debt Service	Refunding Debt Service	Savings
2020	\$ 25,046,500	\$ 22,346,017	\$ 2,700,483
2021	\$ 25,046,500	\$ 22,348,507	\$ 2,697,994
2022	\$ 30,856,500	\$ 27,529,812	\$ 3,326,689
2023	\$ 53,006,000	\$ 47,291,427	\$ 5,714,573
2024	\$ 61,733,500	\$ 55,077,827	\$ 6,655,673
2025	\$ 82,980,875	\$ 74,038,275	\$ 8,942,601
2026	\$ 79,751,875	\$ 71,155,434	\$ 8,596,442
2027	\$ 79,747,988	\$ 71,150,005	\$ 8,597,983
2028	\$ 55,269,163	\$ 49,314,140	\$ 5,955,023
2029	\$ 35,750,663	\$ 31,895,740	\$ 3,854,923
2030	\$ 22,260,663	\$ 19,863,150	\$ 2,397,513
2031	\$ 23,106,163	\$ 20,617,650	\$ 2,488,513
2032	\$ 22,222,263	\$ 19,826,507	\$ 2,395,756
2033	\$ 6,892,663	\$ 6,150,297	\$ 742,366
2034	\$ 13,132,663	\$ 11,719,010	\$ 1,413,653
2035	\$ 13,130,663	\$ 11,715,687	\$ 1,414,976
2036	\$ 13,133,163	\$ 11,717,908	\$ 1,415,255
2037	\$ 22,884,163	\$ 20,417,079	\$ 2,467,084
2038	\$ 22,891,025	\$ 20,422,899	\$ 2,468,126
2039	\$ 22,887,600	\$ 20,421,009	\$ 2,466,591
2040	\$ 22,882,088	\$ 20,416,087	\$ 2,466,001
2041	\$ 22,887,163	\$ 20,420,792	\$ 2,466,371
2042	\$ 21,884,738	\$ 19,525,955	\$ 2,358,783
Total	\$ 779,384,575	\$ 695,381,208	\$ 84,003,367

In addition to the refunding, given the historical low taxable rates, staff are recommending issuing \$50 million of taxable new money bonds. MWRA typically issues tax-exempt bonds to fund its construction projects and community loan programs because of the lower cost of capital. While tax-exempt bonds typically carry a lower interest rate, they come with many Internal Revenue Service restrictions. These include private activity and arbitrage (interest earnings limitations and spending periods) restrictions. The restrictions limit MWRA's ability utilize tax-exempt bonds to fund capital requirements such as the new HECC cable and the homeowner lead line replacement loans. Given the historical low taxable rates, issuing taxable new money bonds will provide MWRA with the flexibility to utilize the funds on projects that might have private activity limitations. In addition to the projects with tax-exempt restrictions, MWRA could utilize this money to fund any capital projects in the Capital Improvement Program. Currently MWRA could issue the new money at an All-In TIC of 3.06%, which is 191 basis points lower than the 20-year average taxable rates that result in an All-In TIC of 4.97%. An All-In TIC of 3.06% would make the bonds MWRA's fifth lowest cost fix rate transaction since 1990.

In addition to the taxable transaction, staff are proposing a tax-exempt refunding of the August 1, 2020 final maturity of the 2002 Series C bonds. 2002 Series C is a variable rate transaction which is currently callable. MWRA's General Bond Resolution requires that 1/12th of every principal payments be funded each month starting a thirteen months before the payment is due. As a result, by October approximately \$11.7 million in funds will be available to put towards the outstanding principal amount. The \$11.7 million will reduce the amount of refunding bonds to be issued from approximately \$36.7 million to approximately \$25 million. By paying, the \$11.7 million off nine month early and the current low tax-exempt rates, MWRA would be able to lock in the following FY20 budgetary savings on the 2002 Series C bonds.

Fiscal Year	Prior Debt Service	Refunding Debt Service	Savings
2020	\$ 36,349,200	\$ 35,771,980	\$ (577,220)

These bonds will represent the first time in MWRA's history that it has issued taxable bonds in the public market. The taxable market is very different from the traditional tax-exempt market with different buyers and more daily volatility in interest rates. This transaction will offer MWRA

the ability to attract new bondholders but it also has a greater risk that market conditions will eliminate the economic viability of the transaction. Long-term taxable fixed interest rates would have to increase by 90 basis points for the entire taxable refunding transaction to fall below the 4% threshold

Similar to the last five refunding transactions, staff intend to issue both the taxable and tax-exempt refunding bonds as “Green Bonds.” Green Bonds are marketed to environmentally responsible investment funds. While there is no required certification for Green Bonds, MWRA will be required to document that the funds were used to pay for projects that provided an environmental benefit. Given MWRA’s mission its projects are green by their nature.

Under the terms of the existing contract, approved by the Board in January 2016, the utilization of senior managers occurs in rotation based on the selection committee’s rankings. As a result of this rotation, Citigroup Global Markets Inc., the first ranked firm, will serve as senior manager for this transaction. Staff will continue to work with MWRA’s financial advisor to determine the most appropriate size and structure for the transaction.

BUDGET/FISCAL IMPACT:

There are sufficient funds available in the FY20 CEBs to pay the debt service costs associated with these borrowings. The potential refunding for savings component will reduce future debt service. The amount of the potential reduction will be determined based on market conditions and the ultimate pricing of the refunding transaction.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Purchase of Vehicles, Liberty Chevrolet, Inc. and Colonial Ford, Inc., Bid WRA-4726



COMMITTEE: Administration, Finance, and Audit

 INFORMATION

 X VOTE


Michele S. Gillen

Director of Administration

Charles Fino, Manager Vehicle Maintenance
Douglas J. Rice, Director, Procurement
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To approve the award of two separate purchase orders for three new Electric Sport Utility Vehicles, two new Cargo Vans, nine new Pickup Trucks, five new Two-Yard Dump Trucks, and four new Service Body Trucks, to the lowest responsive bidders under Bid WRA-4726, Liberty Chevrolet, Inc., and Colonial Ford and authorize the Executive Director, on behalf of the Authority, to execute said purchase orders in the bid amounts of \$1,025,043 to Liberty Chevrolet and \$194,967.10 to Colonial Ford, Inc. under State Contract VEH98, for a total amount of \$1,220,010.10.

DISCUSSION:

As a result of the new regulation (310 CMR 60.06) for Emission Limits for State Fleet Passenger Vehicles and as part of MWRA's commitment to advancing renewable energy, reducing greenhouse gas emissions, and supporting the State's commitment to clean air and public safety, staff are proposing to replace 23 vehicles with a mix of all-electric Chevrolet Bolt sport utility vehicles, diesel and flex-fuel vehicles.

This procurement of new vehicles is being recommended by staff in accordance with MWRA's Vehicle Replacement Policy. The pickup trucks and cargo vans are 8 years old with 125,000 miles and the heavy-duty trucks are 8 years old with 75,000 miles. All of the vehicles being replaced meet or exceed the current replacement criteria for age, mileage and/or condition. This procurement is for three all-electric Chevrolet Bolt sport utility vehicles, two E-85 Flex Fuel General Motors 2500 Series cargo vans, nine new pickup trucks, four new service body trucks, and five two-yard dump trucks.

Fourteen of the replaced vehicles will be declared surplus immediately and disposed of in accordance with MWRA's Surplus Property Policy via a publicly advertised bid or auction. The remaining nine vehicles will be redeployed to the Fleet Pool or to another assignment within the MWRA to replace vehicles in poorer condition, continuing MWRA's policy of extending the useful lives of the vehicles for as long as possible. The replaced vehicles will then be declared surplus.

In FY18, two electric vehicles (a Bolt and a Volt) were purchased and deployed as a first step toward utilizing additional electric hybrid vehicles in the MWRA fleet. In FY19, the fleet was expanded to one new Volt and three new Bolts. This procurement includes three more new Bolts that will be deployed to the Motor Pool for use on a daily basis by personnel attending meetings and visiting sites within the Greater Boston area. The Bolt is an all-electric Sport Utility Vehicle with a range of 238 miles. Its electric engine is powered by a plug-in battery and regenerative power when braking. Two 240-volt fast charging pedestals are being purchased with each electric vehicle. Charging pedestals will be located at the Chelsea Facility, Charlestown Navy Yard and the Southborough Facility.

The two cargo vans are equipped with the E-85 Flex-Fuel (a gasoline/ethanol blend) engine with an estimated fuel economy of 15 to 18 miles per gallon. Ethanol is a renewable, domestically produced transportation fuel, which helps reduce emissions. A flex-fuel vehicle system allows the use of any combination of gasoline or ethanol, from 100% unleaded gasoline all the way up to 85% ethanol.

The five Colorado pickup trucks are equipped with a standard 2.8 direct-injected turbo diesel engine, with crew cab, short bed, in-bed liners, bed boxes, side steps, and standard lighting package.

The five GM K3500 Regular Cab dump trucks are equipped with Duramax Turbo 6.6L, B20 Bio-diesel compatible engine, two-three yard dump body, cold climate package, fisher snow plow, and standard lighting package.

The remaining eight trucks consist of four pickup trucks and four new service body trucks. All eight trucks are equipped with the same Duramax Turbo 6.6L B20 Bio-diesel compatible engine and standard lighting package. However, each remaining truck is designed differently and includes factory-supplied options such as heavy duty towing package capabilities. In addition, the vehicles have special outfitting that may include safety lighting, utility body, lift gates, snowplow, in-bed toolbox, side step bars, dump body, and in-bed liners.



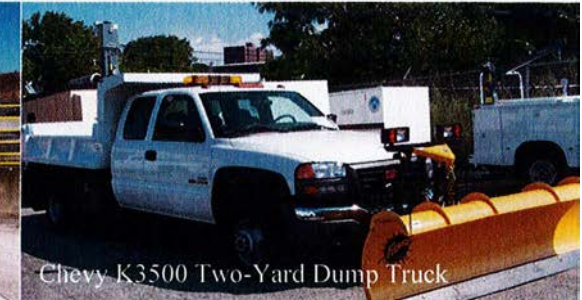
Chevy Bolt



Chevy Cargo Van



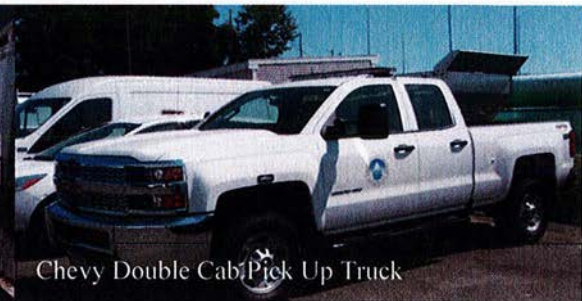
Chevy Colorado Pick Up



Chevy K3500 Two-Yard Dump Truck



Chevy Crew Cab Service Body Truck



Chevy Double Cab Pick Up Truck

Procurement Process

Staff solicited bids from all three firms listed on the Massachusetts State Contract VEH98 for General Motors vehicles. State Contract VEH98 includes a comprehensive range of light duty and heavy-duty vehicles.

On July 31, 2019, Event 3955 closed with the results shown on the following page:

Item	Vehicle	Quantity	Liberty Chevrolet, Inc.	Colonial Ford, Inc.	Mirak Chevrolet, Inc.
1	GM Bolt SUV	3	\$112,524.00	\$116,040.00	\$118,365.39
2	GM 2500 155"WB Cargo Van	2	\$98,814.00	\$100,594.00	No Bid
3	GM Colorado Pickup	5	\$201,845.00	\$194,967.10	\$212,064.45
4	GM K3500 Dump Truck/ Regular Cab	4	\$246,372.00	\$251,260.00	No Bid
5	GM K3500 Dump Truck/ Regular Cab/ Anti Idle	1	\$60,993.00	\$62,815.00	No Bid
6	GM K2500 Pickup DBL Cab	1	\$51,524.00	\$53,390.00	No Bid
7	GM K3500 Crew Cab & Chassis Utility Body	1	\$72,694.00	\$73,123.00	No Bid
8	GM K3500 Crew Cab & Chassis with Gate Valve, and plow	1	\$109,682.00	\$111,065.00	No Bid
9	GM K2500 Reg Cab Pickup	1	\$45,767.00	\$47,456.00	No Bid
10	GM K3500 Reg Cab & Chassis with Concrete Body	1	\$63,188.00	\$64,636.00	No Bid
11	GM K3500 Crew Cab Pickup	1	\$48,483.00	\$50,924.00	No Bid
12	GM K2500 DBL Cab & Chassis with Utility Body and plow	1	\$62,863.00	\$64,624.00	No Bid
13	GM 2500 Crew Cab, and plow	1	\$52,139.00	\$53,611.00	No Bid
	Total Bid Amount		\$1,226,888.00	\$1,244,505.10	\$330,429.84
	Total Award Amount	23	\$1,025,043.00	\$194,967.10	

A table showing the vehicles to be replaced, their current assignments within the agency, the vehicles to be purchased, and the vendors' final bid prices is included as Attachment A.

Staff have reviewed Liberty Chevrolet's and Colonial Ford's bids and have determined that they each meet all of the requirements of the bid specifications. Therefore, staff recommend the award of two separate purchase orders, one to Liberty Chevrolet, Inc. and the other to Colonial Ford, Inc., as the lowest responsive bidders.

BUDGET/FISCAL IMPACT:

There are sufficient funds available for these purchase orders in the Operations Division's FY20 Current Expense Budget. Funding for Line Item 8 is available in the FY20 Capital Improvement Budget.

MBE/WBE PARTICIPATION:

Neither Liberty Chevrolet, Inc. nor Colonial Ford, Inc. are certified as a Minority- or Women-owned business.

ATTACHMENT:

Attachment A – List of the 23 Vehicles to be awarded

FY20 VEHICLE REPLACEMENT REQUEST

Existing Vehicle							Final Bids - WRA4726 - Price per vehicle				Low Bid
Line #	Qty	Reg #	Year	Make/Model	Assigned To	Reason for Replacement	Make/Model & Accessories	Liberty Chevrolet	Colonial Ford	Mirak Chevrolet	
1	3	WRA237	2009	FORD ESCAPE	SUPPORT	AGE, MILEAGE, CONDITION	CHEVROLET BOLT ELECTRIC SUV w/ TWO CHARGING PEDESTALS PER VEHICLE	\$ 37,508.00	\$ 38,680.00	\$ 39,455.13	\$ 112,524.00
		WRA316	2011	FORD ESCAPE	SUPPORT	AGE, MILEAGE, CONDITION					
		WRA247	2014	FORD ESCAPE	WESTERN ADM	AGE, MILEAGE, CONDITION					
2	2	WRA974	2008	CHEVROLET G2500 EXPRESS VAN	TRAC	AGE, CONDITION	155" WB G2500 VAN w/ MIN GVWR OF 8,600 LBS, GENERAL SERVICE INTERIOR, INVERTER & BUMPBER CRANE	\$ 49,407.00	\$ 50,297.00		\$ 98,814.00
		WRA975	2008	CHEVROLET G2500 EXPRESS VAN	TRAC	AGE, CONDITION					
3	5	WRA903	2007	CHEVROLET K1500 EXT CAB PICKUP	DI TRADES MAINTENANCE	AGE, CONDITION	COLORADO SRW CREW CAB SHORT BED PICKUP w/ MIN GVWR OF 6,000 LBS & TOOL BOX	\$ 40,369.00	\$ 38,993.42	\$ 42,412.89	\$ 194,967.10
		WRA383	2012	FORD ESCAPE	WASTEWATER OPS						
		WRA973	2008	GMC K2500 EXT CAB PICKUP	WASTEWATER OPS						
		WRA699	2015	CHEVROLET CC COLORADO PICKUP	TREATMENT & TRANSMISSION	MILEAGE					
		WRA159	2014	FORD ESCAPE	WASTEWATER OPS	MILEAGE					
4	4	WRA080	2010	CHEVROLET K3500 2-YD DUMP	GROUNDS MAINT - WEST	AGE, CONDITION	K3500 REG CAB DRW CAB & CHASSIS w/ MIN GVWR OF 13,000 LBS, 2-YARD BODY & PLOW	\$ 61,593.00	\$ 62,815.00		\$ 246,372.00
		WRA395	1020	CHEVROLET K3500 2-YD DUMP	GROUNDS MAINT - WEST	AGE, CONDITION					
		WRA948	2008	CHEVROLET K3500 2-YD DUMP	GROUNDS MAINT - WEST	AGE, CONDITION					
		WRA954	2008	CHEVROLET K3500 2-YD DUMP	GROUNDS MAINT - WEST	AGE, CONDITION					
5	1	WRA950	2008	CHEVROLET K3500 EXT CAB 2-YD DUMP TRUCK w/ PLOW	PIPE MAINT WATER	AGE, CONDITION	K3500 REG CAB DRW CAB & CHASSIS w/ MIN GVWR OF 13,000 LBS, 2-YARD DUMP BODY, PLOW, & ANTI IDLE	\$ 60,993.00	\$ 62,815.00		\$ 60,993.00
6	1	WRA906	2007	CHEVROLET K1500 EXT CAB PICKUP	DI TRADES MAINTENANCE	AGE, CONDITION	K2500 SRW DOUBLE CAB PICKUP w/ MIN GVWR OF 9,2000 LBS, 6' BED, TOOL BOX, BED COVER & PLOW	\$ 51,524.00	\$ 53,390.00		\$ 51,524.00
7	1	WRA352	2010	GMC CREW CAB SERVICE BODY	FACILITY MAINT - METRO	AGE, MILEAGE, CONDITION	K3500 CREW CAB DRW CAB & CHASSIS w/ MIN GVWR OF 13,000 LBS, OPEN UTILITY BODY, INVERTER & LADDER RACKS	\$ 72,694.00	\$ 73,123.00		\$ 72,694.00
8	1	WRA542	2013	GMC K3500 CREW CAB OPEN UTILITY BODY WITH HYDRAULIC GATE VALVE OPERATOR & SIDE CRANE	GROUNDS MAINT - WEST	MILEAGE, CONDITION	K3500 CREW CAB DRW CAB & CHASSIS w/ MIN GVWR OF 13,000 LBS, OPEN UTILITY BODY WITH SPECIALLY SIZED COMPARTMENTS, HYDRAULIC GATE VALVE OPERATOR & PLOW	\$ 109,682.00	\$ 111,065.00		\$ 109,682.00

FY20 VEHICLE REPLACEMENT REQUEST

Existing Vehicle							Final Bids - WRA4726 - Price per vehicle			Low Bid	
Line #	Qty	Reg #	Year	Make/Model	Assigned To	Reason for Replacement	Make/Model & Accessories	Liberty Chevrolet	Colonial Ford	Mirak Chevrolet	
9	1	WRA154	2010	GMC K3500 REG CAB PICKUP w/ LADDER RACKS	FACILITY MAINT - WEST	AGE, MILEAGE, CONDITION	K2500 SRW REG CAB PICKUP w/ MIN GVWR OF 9,200 LBS, 8' BED, TOOL BOX & LADDER RACKS	\$ 45,767.00	\$ 47,456.00		\$ 45,767.00
10	1	WRA086	2011	GMC K3500 EXT CAB PICKUP	FACILITY MAINT - METRO	CONDITION	K3500 REG CAB DRW CAB & CHASSIS w/ MIN GVWR OF 13,000 LBS, 10' KNAPHEIDE CONCRETE SERIES BODY & LIFT GATE	\$ 63,188.00	\$ 64,636.00		\$ 63,188.00
11	1	WRA351	2011	GMC K3500 CREW CAB PICKUP	FACILITY MAINT - WEST	MILEAGE, CONDITION	K3500 SRW CREW CAB PICKUP w/ MIN GVWR OF 9,200 LBS, 8' BED, TOOL BOX & LADDER RACKS	\$ 48,483.00	\$ 50,924.00		\$ 48,483.00
12	1	WRA905	2007	CHEVROLET K1500 EXT CAB PICKUP	OFFICE OF OCCUPATIONAL HEALTH & SAFETY	AGE, CONDITION	K2500 DOUBLE CAB SRW CAB & CHASSIS w/ MIN GVWR OF 9,200 LBS, OPEN UTILITY BODY, SLIDING BED COVER & PLOW	\$ 62,863.00	\$ 64,624.00		\$ 62,863.00
13	1	WRA424	2012	CHEVROLET K2500 CREW CAB PICKUP w/ FOLD UP TAILGATE RAMP	GROUNDS MAINT - WEST	CONDITION	K2500 SRW CREW CAB PICKUP w/ MIN GVWR OF 9,200 LBS, 8' BED & PLOW	\$ 52,139.00	\$ 53,611.00		\$ 52,139.00
23							Total Bid Submittal by Vendor	\$ 1,226,888.00	\$ 1,244,505.10	\$ 330,429.84	
							Total Award by Vendor	\$ 1,025,043.00	\$ 194,967.10	\$ -	\$ 1,220,010.10

STAFF SUMMARY

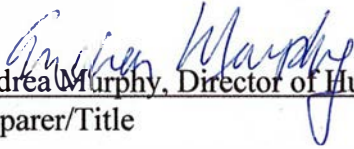
TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Dental Insurance
Delta Dental of Massachusetts
Contract A613, Amendment 2



COMMITTEE: Administration, Finance & Audit

 INFORMATION

 X VOTE


Andrea Murphy, Director of Human Resources
Preparer/Title


Michele S. Gillen
Director, Administration

RECOMMENDATION:

To approve Amendment 2 to Contract A613, with Delta Dental of Massachusetts, exercising the second option to renew, increasing the contract amount by \$352,000, from \$712,000 for a total not-to-exceed amount of \$1,064,000, and extending the term by twelve months from January 1, 2020 to December 31, 2020 for a total contract term of 36 months.

DISCUSSION:

The Authority has been providing dental insurance to all non-union employees since July 1, 1985. This benefit also covers a number of union employees who were accreted into collective bargaining units in 1994. The remaining MWRA union employees receive dental coverage through the Health and Welfare plans of their respective unions.

In December 2017, the Board of Directors approved this contract with Delta Dental of Massachusetts to provide dental insurance to eligible employees for a period of twelve months (Calendar Year 2018), with further options to renew the contract for up to three additional twelve-month periods subject to Board approval. A summary of the contract is set forth below.

This amendment is for the second extension covering Calendar Year 2020 and would maintain the level of coverage currently offered to eligible employees in the areas of diagnostic, preventive, basic and major restorative services as well as limited orthodontic coverage.

Contract Summary	Amount	Term	Dated
Original Contract	\$352,000	One Year	01/01/2018
Amendment 1	\$360,000	One Year	01/01/2019
Amendment 2	\$352,000	One Year	01/01/2020

BUDGET/FISCAL IMPACT:

The rate per employee increased by 4% over last year. However, the number of participants has dropped, so the total annual cost is lower. This contract covers the second half of FY20 and the first half of FY21. The FY20 Current Expense Budget includes the cost of the dental insurance for eligible employees. The total cost of the plan is dependent upon the number of employees enrolled. The remaining cost of the dental insurance program will be included in the FY21 Current Expense Budget.

MBE/WBE UTILIZATION:

There are no MBE/WBE participation requirements established for this contract due to the limited opportunities for subcontracting.



MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

WASTEWATER POLICY & OVERSIGHT COMMITTEE MEETING

to be held on

Wednesday, September 18, 2019

Chair: P. Flanagan
Vice-Chair: J. Walsh
Committee Members:
J. Carroll
C. Cook
J. Foti
A. Pappastergion
B. Peña
H. Vitale

Location: 100 First Avenue, 2nd Floor
Charlestown Navy Yard
Boston, MA 02129

Time: Immediately following AF&A Committee

AGENDA

A. Information

1. 2019 Boston Harbor Beach Update
2. Update on HEEC Cross-Harbor Cable

B. Contract Awards

1. Supply and Delivery of Sodium Hypochlorite to the Deer Island Treatment Plant: Borden & Remington Corporation, WRA-4731

C. Contract Amendments/Change Orders

1. Chelsea Creek Headworks Upgrade: BHD/BEC 2015, A Joint Venture, Contract 7161, Change Order 32

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the Wastewater Policy and Oversight Committee July 17, 2019

A meeting of the Wastewater Policy and Oversight Committee was held on July 17, 2019 at the Authority headquarters in Charlestown. Committee Chair Flanagan presided. Present from the Board were Messrs. Carroll, Cotter, Pappastergion, Peña, Vitale and Walsh. Ms. Wolowicz and Messrs. Cook and Foti were absent. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, Michele Gillen, John Colbert, David Duest, Stephen Cullen, Lisa Bina, Rebecca Weidman, Richard Adams, and Kristin MacDougall. The meeting was called to order at 11:09 a.m.

Information

Thunderstorm Impacts on Wastewater System Operation

Staff made a presentation. (Mr. Carroll left and returned to the meeting during the presentation.) There were questions and answers.

Approvals

* Legal Services Furnished by Special Assistant Attorney General Jonathan Ettinger/Foley Hoag LLP in the Boston Harbor Case, U.S. v. MDC, et al., USDC No. 85-0489-RGS

There was discussion and questions and answers.

The Committee recommended approval (ref. WW B.1).

* Amendments to the MWRA Regulations for Adjudicatory Proceedings, Enforcement and Administrative Penalties, and Sewer Use

Staff made a verbal presentation. There was brief discussion.

The Committee recommended approval. (ref. WW B.2).

* Memorandum of Agreement with the Town of Braintree Regarding MWRA's Use of the Town's Howard Street Pump Station

Staff made a presentation. There was discussion and questions and answers.

The Committee recommended approval. (ref. WW B.3).

* Committee recommendation approved by the Board on July 17, 2019

Contract Awards

*** Maintenance Coating - Deer Island Treatment Plant: Soep Painting Corp., Contract S583**

Staff made a presentation. There was discussion and questions and answers. (Mr. Carroll left the meeting during discussion.)

The Committee recommended approval (ref. WW C.1).

*** Gas Protection System Replacement- Deer Island Treatment Plant: JF White Contracting Co., Contract 7167**

Staff made a verbal presentation. There was brief discussion and questions and answers.

The Committee recommended approval (ref. WW C.2).

*** Piping Relocation at the Pelletizing Plant - Fore River Shipyard: Walsh Construction Company II, LLC, Contract 7173**

Staff made a presentation. There was discussion and questions and answers. (Mr. Carroll returned to the meeting and Mr. Pappastergion left the meeting during discussion.)

The Committee recommended approval (ref. WW C.3).

*** Technical Assistance Consulting Services - Deer Island Treatment Plant: Brown and Caldwell, Contract 7644; Hazen and Sawyer, PC, Contract 7645; Wright-Pierce, Contract 7646**

There were questions and answers. (Mr. Pappastergion returned to the meeting.)

The Committee recommended approval (ref. WW C.4)

The meeting adjourned at 11:35 a.m.

* Committee recommendation approved by the Board on July 17, 2019

STAFF SUMMARY

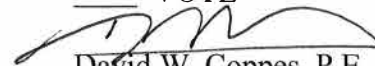
TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: 2019 Boston Harbor Beach Update



COMMITTEE: Wastewater Policy & Oversight

Betsy Reilley, Ph.D., Director, Environmental Quality
Christopher Goodwin, Environmental Scientist, ENQUAL
Preparer/Title

INFORMATION
VOTE



David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

For information only.

DISCUSSION:

The Department of Public Health is responsible for implementing bathing beach regulations, and the Massachusetts Department of Conservation and Recreation (DCR) is responsible for management of the beaches in the Boston area. Since 1996, MWRA has provided technical and laboratory assistance to DCR for its water quality monitoring program at beaches in Boston Harbor.



During the swimming season, typically from late May to Labor Day each year, DCR performs routine water quality sampling at its urban coastal beaches in the metropolitan Boston area, including Quincy, Dorchester, South Boston, East Boston, Winthrop, Lynn, and Revere. Bacteria samples are collected daily at many beaches, but weekly at beaches that historically meet standards. Bacteria samples of *Enterococcus* that are over 104 MPN/100mL trigger posting of beach closures. Although, for the beaches sampled weekly that have demonstrated good water quality (e.g., the South Boston beaches), posting requires two consecutive samples over the 104 standard.

Precautionary beach postings can also be issued following moderate to large rain events, with the rain thresholds varying by beach.

Postings may also occur due to *geometric mean* failures (a statistic calculated from the product of the most recent five bacteria results¹). EPA National Beach Guidance states that the geometric mean calculations are useful for understanding the longer-term water quality trends at a beach,

¹ The geometric mean indicates the 'typical' value in a set of numbers by using the product, as opposed to the arithmetic mean, which uses the sum.

typically 30 days. MA DPH requires the 5-sample geometric mean as part of the beach posting requirements. Until this year, DPH had recognized that some beaches, especially beaches sampled daily, may have limited, short-term impacts from rain events and stormwater and therefore did not include rainy days in the geometric mean calculation, as these would skew the results.

2019 Beach Sampling Results

In 2019 MA DPH implemented a unilateral change in the 5-sample geometric mean calculation to include rainy day samples in the calculation; this has had the impact of prolonging postings at a number of beaches. Specifically, Wollaston Beach had five more postings, Malibu had 11 more postings, and Constitution had four more postings using the new calculation method (see Table 1). Those added postings included July 4th and 5th at Wollaston, Malibu, and Constitution, as well as Sunday-Monday of Labor Day weekend at Malibu Beach. While a geometric mean provides a useful tool to evaluate long-term beach management, as was originally intended by the regulations, it does not represent the beach bacteria levels on a given day and results in beach closings on days when the water is clean. MWRA disagrees with the MA DPH change and continues to advocate for a more appropriate application of the geometric mean calculation. Staff have a meeting scheduled with MA DPH officials this month to discuss our concerns with the impacts of its calculation change on beaches sampled daily. MWRA will suggest changes to MA DPH’s geometric mean calculation that will better reflect public health concerns and recreational opportunities.



This year’s swimming season was unusually wet, particularly in June and July. The Logan Airport rain gauge recorded 14.45” of rain from June through August, 5” above the mean for that period. Water quality at several beaches in the region is impacted by rain events due to stormwater and possibly illicit connections, but typically only for a day or two. Despite the wet weather, there were no postings at any South Boston beaches in 2019.

Table 1. Impacts on Postings due to Geometric mean Change













Beach	Days Posted (previous method)	Change	Days Posted (2019 method)
King’s	35	+18	53
Tenean	64	+1	65
Wollaston	24	+5	29
Malibu	21	+11	32
Constitution	14	+4	18
Net postings added by the change:			39

A map of Boston area beaches is Figure 1 below. Postings at harbor beaches are summarized in Table 2.



Figure 1. Boston Harbor Beaches managed by DCR. Daily sampled beaches appear in purple.

Table 2. Boston Harbor Beaches 2019: Compliance with Bacterial Limits

Beach	Percent of all samples meeting swimming standards (5-year average in gray)	Total Postings ¹
Carson Beach , S. Boston (weekly; 2 sampling sites)	100% (98%)	 0 days
M Street Beach , S. Boston (weekly; 1 sampling site)	100% (100%)	 0 days
City Point Beach , S. Boston (weekly; 1 sampling site)	100% (98%)	 0 days
Pleasure Bay Beach , S. Boston (weekly; 3 sampling sites)	98% (100%)	 0 days
Tenean Beach , Dorchester (daily; 1 sampling site)	67% (83%)	 65 days
Malibu Beach , Dorchester (daily; 1 sampling site)	83% (92%)	 32 days
Wollaston Beach , Quincy (daily; 4 sampling sites)	87% (91%)	 29 days ²
Constitution Beach , E. Boston (daily; 3 sampling sites)	87% (94%)	 18 days
Winthrop Beach , Winthrop (weekly; 1 sampling site)	76% (98%)	 4 days
Short Beach , Winthrop (weekly; 1 sampling site)	88% (90%)	 0 days
Revere Beach , Revere (weekly; 4 sampling sites)	87% (97%)	 1 day
King's Beach , Lynn (daily; 3 sampling sites)	79% (82%)	 53 days ²

¹ Geometric mean postings and precautionary postings due to rainfall are included. There were 103 days in the 2019 sampling season.

² Wollaston Beach and King's Beach can be closed on a partial basis; number reflects days with partial closures.


STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Update on HEEC Cross-Harbor Cable




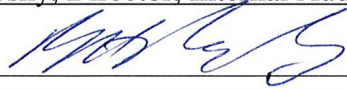
COMMITTEE: Wastewater Policy & Oversight

INFORMATION
 VOTE



Thomas J. Durkin
Director of Finance

Brian A. Rozowsky, Director, Internal Audit
Preparer/Title



David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

For information only. Replacement of the Harbor Electric Energy Company (HEEC) cable, which was installed in 1990 as the main source of power for the Deer Island wastewater treatment plant, was completed on August 23, 2019 when the new cable was energized four months ahead of schedule. This staff summary presents a recap of the financial issues related to the cable.

DISCUSSION:

MWRA staff were able to negotiate several key financing points that resulted in an advantageous agreement for the MWRA ratepayers. The cost of the cable was preliminarily estimated at \$110 - \$114 million. With further design developments, the estimate became \$115.6 million. Initially, HEEC presented the financing of the cable as a \$115.6 million project to be paid by MWRA over 30 years at 9.6%.

The MWRA negotiating team proposed a credit of \$3.5 million be allowed for the incentive payment that had been paid to HEEC in 1990 for completing construction of the original cable on time. The team also proposed a credit be allowed for the remaining life of the original cable. The cable was estimated to be in service 30-50 years but was only 27 years old. HEEC agreed to a \$17.5 total credit. This credit reduced the estimated total project cost to \$98.1 million. Depending on the corporate tax rate, applicability of the Bonus Depreciation accounting treatment and the final project cost, this credit reduced the financing cost by an estimated \$28.9 to \$55.6 million.

Recognizing the significant financing cost that would be paid to HEEC over the 30-year term, the MWRA negotiating team proposed making a "down payment." HEEC agreed to accept 50% of the net project cost at or before substantial completion of the cable installation. The down payment of \$49.1 million would be funded through current revenue for capital in MWRA's construction fund. This financing point reduced the estimated project cost to be financed through HEEC to

\$49.1 million. Early estimates at the time of negotiation estimated the reduction in the financing cost to be \$96.2 million. This estimate will be significantly impacted by the corporate tax rate, applicability of the Bonus Depreciation accounting treatment and the final project cost.

The return on equity that HEEC would receive on the project will be 9.6%. Assuming a 30% corporate tax rate at the time, this calculated to a 13.7% effective cost for MWRA. The MWRA negotiating team proposed HEEC finance a portion of the project with less expensive debt rather than finance the project exclusively with shareholder equity. HEEC agreed to a 55% debt – 45% equity capital structure. The cost of debt was estimated to be 4.5%. This change in capital structure resulted in a lower weighted average cost of capital of 6.8%. Adjusted up for taxes, this 6.8% is estimated to be 9.7% though it will also be significantly impacted by the tax considerations for HEEC. This lower rate will be in effect for the 30-year duration of the agreement.

Confronted with the environmental, engineering and financial uncertainties surrounding the plan to remove sections of existing cable and to abandon in place other sections after draining, capping and disposal of the dielectric fluid, MWRA and HEEC agreed to cap MWRA’s responsibility for this decommissioning work at \$9 million. This financial point provided MWRA with certainty with regard to the maximum cost of the decommission component of the total project cost.

In November 2018, MWRA notified HEEC of its preference to pay the first 50% of the project cost throughout the time of installation. Making progress payments rather than waiting until substantial completion would save MWRA the cost of capital during construction. Without this financing point, technically referred to as the Allowance for Funds being Used During Construction, MWRA would pay this allowable expense and be subject to HEEC’s financing cost for the 30 years. This import language was included in the Memorandum of Agreement and is estimated to save MWRA between \$2.2 and \$2.9 million. MWRA has paid \$35 million to date.

The installation of the land portion of the cable required an \$8 million easement through Massport’s Conley Terminal in South Boston, which was negotiated between HEEC and Massport as stipulated by the federal court order. MWRA is not a co-permittee. The MWRA Advisory Board continues to take exception to the cost of the Conley Terminal easement and is pursuing financial relief.

BUDGET/FISCAL IMPACT:

The FY20 Current Expense Budget includes sufficient funds based on current estimates. Additionally, staff have estimated the future annual payments to be paid to HEEC. These estimates will be adjusted to reflect the timing and amounts of the eventual tariff that will be determined by the Massachusetts Department of Public Utilities. To reduce the anticipated spike to the current Expense Budget in FY2020 – FY2021 caused by the higher cost of the new cable, in FY2018, \$6.5 million was budgeted and reserved to smooth this spike. The net cost of the cable was incorporated in the future rates projections presented to the Board as part of the FY20 Current Expense Budget approval.

STAFF SUMMARY

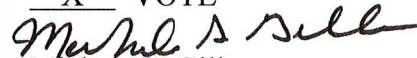
TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Supply and Delivery of Sodium Hypochlorite to the Deer Island Treatment Plant
Borden & Remington Corporation
Bid WRA-4731



COMMITTEE: Wastewater Policy & Oversight

 INFORMATION

 X VOTE



Michele S. Gillen

Director of Administration

David Duest, Director, DIWWTP
Douglas J. Rice, Director of Procurement
Preparer/Title



David W. Coppes, P.E.

Chief Operating Officer

RECOMMENDATION:

To approve the award of Purchase Order Contract WRA-4731 for the supply and delivery of sodium hypochlorite to the Deer Island Treatment Plant, to the lowest responsive bidder, Borden & Remington Corporation, and to authorize the Executive Director, on behalf of the Authority, to execute said purchase order contract in an amount not to exceed \$1,644,486.98 for a period of one year, from November 17, 2019 through November 16, 2020.

DISCUSSION:

MWRA uses sodium hypochlorite, which is a combination of chlorine and caustic soda, at the Deer Island Treatment Plant primarily for NPDES permit compliance for pathogen control, to disinfect the plant's effluent. It is also used for air permit compliance for emissions control in the plant's odor control systems to treat for hydrogen sulfide.

Sodium hypochlorite is stored in three above ground tanks, each 30 feet high and 40 feet in diameter (shown at right), with a capacity to hold 250,000 gallons per tank.

Sodium hypochlorite is generally manufactured in different strengths: 15%,



19%, and 20% solution. The differing strengths do not affect the Deer Island treatment processes in any way; the only differences between them are unit cost, availability and the amount of material delivered. The most common and widely available strength is the 15% grade solution, but this requires the largest delivered volume. In previous contracts, MWRA has purchased both 15% and 19% solution. Under the existing contract, also with Borden & Remington Corporation, MWRA is purchasing solely a 19% grade solution. Although the unit price for 19% is slightly higher, the total cost is less because less volume is delivered to the treatment plant. Upon delivery and no matter the delivered strength, staff dilute the delivered product to an end use strength of 10-12%. When comparing actual total chlorine purchased, the 19% has proven to be more cost-effective, and results in 22% less trucks being driven to Deer Island as compared to the 15% strength product.

Procurement Process

Bid WRA-4731 was advertised in the following publications: Boston Herald, Goods and Services Bulletin, El Mundo, and Banner Publications. In addition, bids were made available for public downloading on MWRA's e-procurement system (Event 3970), and five potential bidders were solicited through the e-Portal.

On August 19, 2019, Event 3970 closed, with the following results:

Borden & Remington Corporation	Estimated Gallons	Percentage Solution	Unit Price Per Gallon	Extended Bid Price
	2,200,000	15% Solution	\$0.77160	\$1,697,520.00
	1,750,199	19% Solution	\$0.93960	\$1,644,486.98
	1,650,000	20% Solution	No Bid	No Bid
Kuehne Chemical Corporation	Estimated Gallons	Percentage Solution	Unit Price Per Gallon	Extended Bid Price
	2,200,000	15% Solution	\$1.50	\$3,300,000.00
	1,750,199	19% Solution	\$1.90	\$3,325,378.10
	1,650,000	20% Solution	\$2.00	\$3,300,000.00

Vendors were given the option to provide a unit bid price for any number of the three available grades of sodium hypochlorite. Under the current contract with Borden & Remington Corporation, which expires on November 16, 2019, MWRA is paying a fixed price of \$0.92200 per gallon for 19% solution for an annual cost of \$1,613,683.48. Compared to the existing contract, the cost per gallon price has increased by 1.87% or \$0.0176 per gallon. The not to exceed amount of the contract is not a firm commitment of cost or a guarantee of purchase to the vendor; MWRA will only pay for product delivered and received.

The large discrepancy in bid prices between the vendors can be attributed to a more aggressive bidding approach taken by Borden & Remington compared to Kuehne Chemical Corporation. Shipping costs also were a factor in the price discrepancy: Borden & Remington has lower shipping costs as its deliveries originate in Fall River, Massachusetts whereas Kuehne ships from New Jersey and incurs higher shipping costs.

Staff have reviewed Borden & Remington Corporation's bid and have determined that it meets all of the requirements of the bid specifications. Therefore, staff recommend the award of this one-year purchase order contract to Borden & Remington Corporation, as the lowest responsive bidder.

BUDGET/FISCAL IMPACT:

There are sufficient funds available for the first portion of this contract in the approved FY20 Current Expense Budget. Appropriate funding will be included in the Proposed FY21 Current Expense Budget request for the remaining term of the contract.

MBE/WBE/PARTICIPATION:

Borden & Remington Corporation is not a certified Minority- or Women-owned business.

STAFF SUMMARY


TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Chelsea Creek Headworks Upgrade
BHD/BEC 2015, A Joint Venture
Contract 7161, Change Order 32



COMMITTEE: Wastewater Policy & Oversight

INFORMATION
 VOTE

Corinne M. Barrett, Director, Construction
Martin E. McGowan, Construction Coordinator
Preparer/Title



David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to approve Change Order 32 to Contract 7161, Chelsea Creek Headworks Upgrade, with BHD/BEC 2015, A Joint Venture, for an amount not to exceed \$245,616.00, increasing the contract amount from \$81,554,689.46 to \$81,800,305.46, with no increase in contract term.

Further, to authorize the Executive Director to approve additional change orders as may be needed to Contract 7161 in an amount not to exceed the aggregate of \$250,000, in accordance with the Management Policies and Procedures of the Board of Directors.

DISCUSSION:

The Chelsea Creek Headworks is one of three remote headworks facilities that provides preliminary treatment and flow control of the wastewater from MWRA's Northern Service Area before reaching the Deer Island Treatment Plant. Preliminary treatment at the headworks facilities includes grit and screenings removal, which prevents excessive wear and maintenance of equipment at the North Main Pump Station, and protects the cross-harbor tunnels from filling with debris. The Chelsea Creek Headworks was constructed in the 1960s and received its last significant upgrade in 1987.

This project is the first of the complete upgrades to the three headworks facilities and includes automation of the screenings collection and solids conveyance system, allowing the facility to be unstaffed during dry weather flows. The following items are being replaced:

- grit collector systems;
- existing climber screens with catenary screens;
- influent and effluent sluice gates;
- the gates' hydraulic operating system with electric gate actuators;

- HVAC systems will be upgraded;
- a new carbon adsorber odor control system is being installed and redundancy is being added to both systems;
- ancillary systems including the emergency generator, fuel oil tank, and transformer are being replaced;
- instrumentation and control systems are being upgraded;
- the communications tower is being replaced and a communications building is being added;
- abatement of hazardous building materials including paint containing PCBs, flood protection measures to protect the facility to the 100-year flood elevation plus 2.5 feet, and upgrades to meet current code requirements for egress, plumbing, electrical; and,
- fire suppression.

This Change Order

Change Order 32 consists of the following three items:

Revised Odor Control Duct and Duct Supports

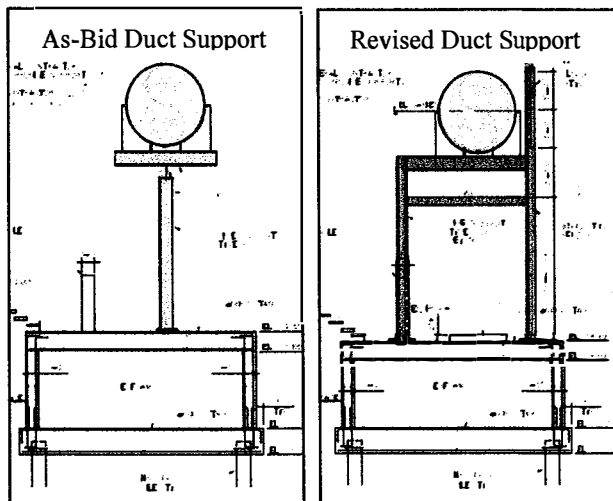
Not to Exceed \$125,000

The Contractor is required to furnish and install fiberglass reinforced plastic (FRP) ductwork for the new outdoor odor control system. The ductwork system includes approximately 225 linear feet of 72-inch diameter FRP duct that connects the Headworks facility to the three odor control fans located outdoors on the south side of the site. There is a 60-foot section of duct near the fans that is concealed with an equipment screen intended to provide a visual barrier from the street. After commencement of the contract, a number of changes to the 72-inch odor control duct, associated supports and equipment screen were required.

The contract documents indicate that the odor control duct located at the fans should be installed level. During submittal review and prior to shop fabrication, the design engineer confirmed this section of outdoor duct is susceptible to condensation and needs to be pitched to the low point drains. To correct this error, the duct elevations at the fans were changed. This change resulted in an additional butt weld at fan #3 and additional fiberglass buildups to accommodate for the slope at the three fan transition pieces and two expansion joint flanges.



Typical Odor Control Duct Supports



There were also conflicts between the fan motors and the four duct supports located on the foundation. In addition, the contract documents provided no connection details for supporting the duct screen. The design engineer acknowledged the conflicts and stated their original design did not account for the weight and wind load of the duct screen. These errors required a redesign of the original support system at the fan foundation. To eliminate the conflicts and provide support for the duct screen, the four single stanchion supports were increased to four double stanchion supports and one single stanchion support that included additional bracing for mounting the duct screen.

Finally, the contract documents require a 1/4-inch rubber sheet be installed at each duct support to provide a fully padded interface between the FRP duct and steel supports. The FRP duct will expand and contract based on normal temperature fluctuations, so the duct support design accounts for this anticipated movement by having a combination of fixed supports and sliding supports. The rubber is an appropriate interface material for fixed supports, but does not allow for duct movement at sliding supports. To correct this error, the interface material must be changed from rubber to Teflon at all sliding supports. The Contractor must furnish and install 1/4-inch Teflon bearing pads at twenty-one sliding supports in lieu of the specified rubber sheets.

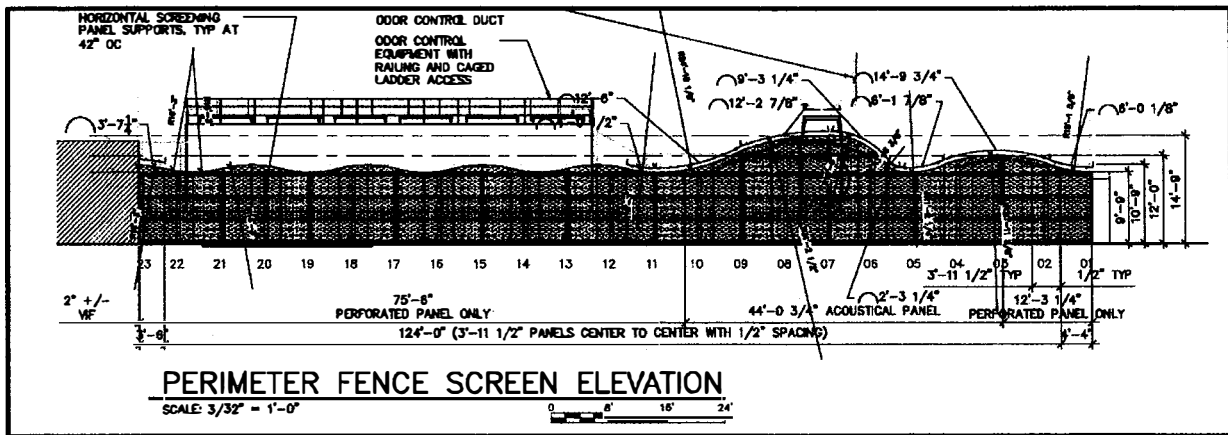
The approved PCO for this item was identified by MWRA staff as a design error and the design consultant agreed. MWRA staff, the Consultant, and the Contractor have agreed to a not to exceed amount of \$125,000 for this additional work. The Contractor proceeded with this work at its own risk in order to proceed with the remainder of the contract work.

A similar change order was approved by the board for the equipment screen and supports required on the lower roof of the headworks facility. Due to timing of the design modifications and sequence of work, it was necessary to split the equipment screen change order at the building and out at the yard. Staff anticipate this change, along with the next item related to the perimeter fence screen, will be the final modifications to architectural screening for this project.

Revised Posts to Support Perimeter Fence Screen Wall

\$70,616

The Contractor is required to furnish and install a perimeter fence screen wall along the southern property line of the site. Similar to the equipment screen described in the item above, the screen wall is an architectural feature that provides a visual barrier while also reducing sound levels generated from the new 250-horsepower odor control fans. The screening wall is comprised of 2-inch thick perforated aluminum panels with an acoustic fill that are supported by galvanized structural supports secured to the perimeter fence posts. The design of the screening wall is a series of curves that vary in height from approximately 10 feet to 15 feet along the 132-foot southern boundary as shown in the sketch below.



After commencement of the contract it was determined the specified 2.5-inch diameter schedule 40 perimeter fence posts, embedded 3 feet and spaced 10 feet apart, would not support the new screening wall as designed. The design was re-evaluated and determined that 6-inch diameter posts, embedded 10 feet deep and spaced 6 feet apart, would be needed to support the screening wall against the lateral wind loads. To correct this error, the Contractor will be required to furnish and install twenty-three 10-inch casings, embedded 10 feet, with 6-inch diameter schedule 40 galvanized pipe to support the new perimeter screen wall in lieu of specified supports.



Drilling casings along property line for larger posts

The approved PCO for this item was identified by MWRA staff as a design error and the design consultant agreed. MWRA staff, the Consultant, and the Contractor have agreed to a lump sum amount of \$70,616 for this additional work. The Contractor proceeded with this work at its own risk in order to proceed with the remainder of the contract work.

Increase Chelsea Fire Department Allowance

Not to Exceed \$50,000

Bid Item 1-B is an allowance established for Fire Department Services for the Chelsea Fire Department to provide fire watch services during all hot work, such as welding, cutting, torching and grinding. The original allowance was \$50,000 based on an estimate made during design. To date, the contract is approximately 56% complete and approximately \$49,000 has been spent. Change order work, such as additional girt framing, stair A and stair C structural improvements, grit pipe relocation and grit pipe support changes have significantly increased the need for fire department services to oversee the welding necessary to complete these activities. Staff anticipate that the remaining amount will be expended and that an additional \$50,000 will be needed for the remaining contract work.

The approved PCO for this item was identified by MWRA staff as an overrun in quantities. MWRA staff and the Contractor have agreed to a not to exceed amount of \$50,000 for this additional work. Work associated with this proposed change order has not begun.

Staff are compiling a list of all change order items that have resulted from an error or omission and will conduct a review at the end of the project regarding responsibility of the Design Consultant, Arcadis U.S., Inc., and the potential for any cost recovery. Although the Contractor agrees with the pricing in this change order, it does not agree with MWRA's determination of no increase in contract term.

CONTRACT SUMMARY:

<u>Amount</u>	<u>Time</u>	<u>Dated</u>	
Original Contract:	\$72,859,000.00	1,460 Days	11/22/16
Change Orders:			
Change Order 1	\$252,512.00	0 Days	06/29/17
Change Order 2*	\$208,431.00	0 Days	07/24/17
Change Order 3	\$1,129,740.20	0 Days	07/24/17
Change Order 4*	\$237,870.00	0 Days	10/18/17
Change Order 5	\$304,036.26	0 Days	12/21/17
Change Order 6*	\$207,226.00	0 Days	01/26/18
Change Order 7	\$1,278,783.00	0 Days	02/07/18
Change Order 8	\$937,267.00	0 Days	02/22/18
Change Order 9	\$17,321.00	0 Days	04/03/18
Change Order 10*	\$20,879.00	0 Days	04/11/18
Change Order 11*	\$200,000.00	0 Days	05/18/18
Change Order 12	\$1,000,000.00	0 Days	05/31/18
Change Order 13*	\$129,783.00	0 Days	06/12/18
Change Order 14	\$500,000.00	0 Days	06/28/18
Change Order 15*	\$24,634.00	0 Days	08/20/18
Change Order 16*	\$21,584.00	0 Days	08/24/18
Change Order 17*	\$109,065.00	0 Days	09/13/18
Change Order 18	\$395,742.00	0 Days	09/28/18
Change Order 19*	\$18,351.00	0 Days	10/26/18
Change Order 20*	\$20,123.00	0 Days	11/06/18
Change Order 21*	\$82,621.00	0 Days	11/13/18
Change Order 22	\$182,792.00	0 Days	11/19/18
Change Order 23*	\$70,125.00	0 Days	12/17/18
Change Order 24*	\$15,618.00	0 Days	01/24/19
Change Order 25*	\$149,469.00	0 Days	02/19/19
Change Order 26	\$375,000.00	0 Days	03/14/19
Change Order 27*	\$24,238.00	0 Days	05/21/19
Change Order 28*	\$213,402.00	0 Days	06/17/19
Change Order 29	\$380,778.00	0 Days	07/16/19
Change Order 30*	\$24,122.00	0 Days	08/12/19
Change Order 31*	\$164,177.00	0 Days	Pending
Change Order 32	<u>\$245,616.00</u>	<u>0 Days</u>	Pending
Total of Change Orders:	\$8,941,305.46	0 Days	
Adjusted Contract:	\$81,800,305.46	1,460 Days	

* Approved under delegated authority

If Change Order 32 is approved, the cumulative value of all change orders to this contract will be \$8,941,305.46 or 12.3% of the original contract amount. Work on this contract is approximately 56% complete.

BUDGET/FISCAL IMPACT:

The FY20 Capital Improvement Program budget includes \$82,503,972 for Contract 7161. Including this change order for \$245,616.00, the adjusted subphase total will be \$81,800,305.46.

MBE/WBE PARTICIPATION:

The MBE/WBE participation requirements for this project were established at 3.4% and 3.8%, respectively. The Contractor has been notified that these requirements are still expected to be met.



MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

BOARD OF DIRECTORS' MEETING

Chair: K. Theoharides
Vice-Chair: J. Carroll
Secretary: A. Pappastergion
Board Members:
C. Cook
K. Cotter
P. Flanagan
J. Foti
B. Peña
H. Vitale
J. Walsh
J. Wolowicz

to be held on

Wednesday, September 18, 2019

Location: 100 First Avenue, 2nd Floor
Charlestown Navy Yard
Boston, MA 02129

Time: 1:00 p.m.

AGENDA

- I. **APPROVAL OF MINUTES**
- II. **REPORT OF THE CHAIR**
- III. **REPORT OF THE EXECUTIVE DIRECTOR**
- IV. **BOARD ACTIONS**

A. Approvals

1. Battery Storage Demonstration Project at Brattle Court Pump Station and Chelsea Facility – Utility Tariff Optimization Service and Site License Agreement: Stem, Inc. (ref. W B.1)
2. PCR Amendments – September 2019 (ref. P&C A.1)
3. Appointment of Program Manager, Process Control and Project Support (ref. P&C A.2)
4. Appointment of Program Manager, Wastewater Operations (ref. P&C A.3)
5. Appointment of Manager, IT Security, Architecture and Engineering, MIS (ref. P&C A.4)
6. Appointment of Communications Manager, Metropolitan Tunnel Redundancy Program (ref. P&C A.5)
7. Appointment of Senior Staff Counsel, Law Division (ref. P&C A.6)
8. Bond Defeasance of Future Debt Service (ref. AF&A B.1)

A. Approvals (continued)

9. Approval of the Eighty-first Supplemental Resolution (ref. AF&A B.2)

B. Contract Awards

1. Design and Engineering Services During Construction for Quinapoxet Dam Removal: Milone & MacBroom, Inc. Contract 7347 (ref. W C.1)
2. Section 56 Replacement Saugus River Crossing, Design and Engineering Services During Construction: AECOM Technical Services, Inc., Contract 7454 (ref. W C.2)
3. Purchase of Vehicles: Liberty Chevrolet, Inc. and Colonial Ford, Inc., Bid WRA-4726 (ref. AF&A C.1)
4. Supply and Delivery of Sodium Hypochlorite to the Deer Island Treatment Plant: Borden & Remington Corporation, WRA-4731(ref. WW B.1)

C. Contract Amendments/Change Orders

1. Wachusett Aqueduct Pumping Station Design, Construction Administration and Resident Inspection Services: Stantec Consulting Services, Inc., Contract 7156, Amendment 5 (ref. W D.1)
2. Pay Equity Consulting Services: Hirsch Roberts Weinstein LLP, Contract A616, Amendment 1 (ref. P&C B.1)
3. Dental Insurance: Delta Dental of Massachusetts, Contract A613, Amendment 2 (ref. AF&A D.1)
4. Chelsea Creek Headworks Upgrade: BHD/BEC 2015, A Joint Venture, Contract 7161, Change Order 32 (ref. WW C.1)

V. OTHER BUSINESS

VI. CORRESPONDENCE TO THE BOARD

VII. EXECUTIVE SESSION

- A. Collective Bargaining:
Paid Family Medical Leave Act

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the Board of Directors

July 17, 2019

A meeting of the Board of Directors of the Massachusetts Water Resources Authority was held on Wednesday, July 17, 2019 at the Authority headquarters in Charlestown. Vice Chair Carroll presided. Present from the Board were Messrs. Cotter, Flanagan, Pappastergion, Peña, Vitale and Walsh. Secretary Theoharides, Ms. Wolowicz and Messrs. Cook and Foti were absent. Among those present from the Authority staff were Frederick Laskey, Executive Director, Carolyn Francisco Murphy, General Counsel, David Coppes, Chief Operating Officer, Carolyn Fiore, Deputy Chief Operating Officer, Thomas Durkin, Director of Finance, Michele Gillen, Director of Administration, Kathleen Murtagh, Director of Tunnel Redundancy, Corinne Barrett, Director of Construction, John Colbert, Chief Engineer, and Assistant Secretaries Ria Convery and Kristin MacDougall. Vandana Rao, EEA, was also in attendance. The meeting was called to order at 1:03 p.m.

APPROVAL OF JUNE 19, 2019 MINUTES

Upon a motion duly made and seconded, it was

Voted: to approve the minutes of the Board of Directors' meeting of June 19, 2019 as presented and filed with the records of the meeting.

REPORT OF THE EXECUTIVE DIRECTOR

Mr. Laskey recognized Russell Murray, Director of MIS, and Barbara Allen, Public Affairs, upon their upcoming retirements and thanked them for their service. He updated the Board on CSO post-construction assessment with respect to a scheduled public meeting and court report filings. He also provided a brief update on Quabbin Reservoir levels and spill rates.

Mr. Laskey further advised the Board that staff may seek authorization to issue a change order on the Southern Extra High project at a future meeting due to groundwater and soil conditions. MWRA staff then made a presentation on the project. There were questions and answers.

APPROVALS

Legal Services Furnished by Special Assistant Attorney General Jonathan Ettinger/Foley Hoag LLP in the Boston Harbor Case, U.S. v. MDC, et al., USDC No. 85-0489-RGS (ref. WW B.1)

Upon a motion duly made and seconded, it was

Voted: that the Board approve an increase to the hourly rate at which the Authority compensates Foley Hoag LLP for the legal services furnished by Attorney Jonathan Ettinger in his capacity as a Special Assistant Attorney General in representing the Authority in the Boston Harbor case, from \$460 an hour to \$625 an hour for FY2020 and \$700 an hour for FY2021.

Amendments to the MWRA Regulations for Adjudicatory Proceedings, Enforcement and Administrative Penalties, and Sewer Use (ref. WW B.2)

Upon a motion duly made and seconded, it was

Voted: to authorize the adoption of amendments to MWRA's Regulations for Adjudicatory Proceedings (360 CMR 1.00), Enforcement and Administrative Penalties (360 CMR 2.00), and Sewer Use (360 CMR 10.000) (summary chart attached) by publication in the Code of Massachusetts Regulations.

Memorandum of Agreement with the Town of Braintree Regarding MWRA's Use of the Town's Howard Street Pump Station (ref. WW B.3)

Upon a motion duly made and seconded, it was

Voted: to authorize the Executive Director, on behalf of the Authority, to enter into a Memorandum of Agreement, substantially in the form attached hereto, with the Town of Braintree for a term of five years, for MWRA's use of the Town's Howard Street Pump Station and which provides for payment to the Town for past and future operations and maintenance costs and capital improvements.

PCR Amendments - July 2019 (ref. P&C A.2)

Upon a motion duly made and seconded, it was

Voted: to approve amendments to the Position Control Register (PCR) as presented and filed with the records of the meeting.

Appointment of Director, Management Information Systems, Administration Division
(ref. P&C A.2)

Upon a motion duly made and seconded, it was

Voted: to approve the appointment of Ms. Paula Weadick to the position of Director, Management Information Systems (Non-Union, Grade 16) at an annual salary of \$162,825, commencing on a date to be determined by the Executive Director.

CONTRACT AWARDS

Maintenance Coating - Deer Island Treatment Plant: Soep Painting Corp., Contract
S583 (ref. WW C.1)

Upon a motion duly made and seconded, it was

Voted: to approve the award of Contract S583, Maintenance Coating Contract, Deer Island Treatment Plant, to the lowest eligible and responsible bidder, Soep Painting Corporation, and to authorize the Executive Director, on behalf of the Authority, to execute said contract in the amount of \$2,495,000, for a contract term of 600 calendar days from the Notice Proceed.

Gas Protection System Replacement - Deer Island Treatment Plant: JF White
Contracting Co., Contract 7167 (ref. WW C.2)

Upon a motion duly made and seconded, it was

Voted: to approve the award of Contract 7167, Deer Island Treatment Plant, Gas Protection System Replacement, Phase I, to the lowest eligible and responsible bidder J. F. White Contracting Company, and to authorize the Executive Director, on behalf of the Authority, to execute said contract in the amount of \$1,402,995, for a contract term of 540 calendar days from the Notice to Proceed.

Piping Relocation at the Pelletizing Plant- Fore River Shipyard: Walsh Construction
Company II, LLC, Contract 7173 (ref. WW C.3)

Upon a motion duly made and seconded, it was

Voted: to approve the award of Contract 7173, Piping Relocation at the Pelletizing Plant, to the lowest responsible and eligible bidder, Walsh Construction Company II, LLC and to authorize the Executive Director, on behalf of the Authority, to

execute said contract in the bid amount of \$4,250,445, for a contract term of 450 calendar days from the Notice to Proceed.

Technical Assistance Consulting Services- Deer Island Treatment Plant: Brown and Caldwell, Contract 7644; Hazen and Sawyer, PC, Contract 7645; Wright-Pierce, Contract 7646 (ref. WW C.4)

Upon a motion duly made and seconded, it was

Voted: to approve the recommendation of the Consultant Selection Committee to select Brown and Caldwell, Hazen and Sawyer, P.C., and Wright-Pierce to provide as-needed technical assistance consulting services for the Deer Island Treatment Plant and to authorize the Executive Director, on behalf of the Authority, to execute Contract 7644 with Brown and Caldwell, Contract 7645 with Hazen and Sawyer, P.C. and Contract 7646 with Wright-Pierce, each in an amount not to exceed \$1,800,000 each and for a contract term of three years from the Notice to Proceed.

Section 22 Rehabilitation Alternative Analysis and Environmental Permitting: Black & Veatch, Contract 7155 (ref. W A.1)

Upon a motion duly made and seconded, it was

Voted: to approve the recommendation of the Consultant Selection Committee to award Contract 7155, Section 22 Rehabilitation Alternatives Analysis and Environmental Permitting, to Black & Veatch Corporation, and to authorize the Executive Director, on behalf of the Authority, to execute said contract in the amount of \$2,870,000 for a contract term of 36 months from the Notice to Proceed. Following the notice to proceed, MWRA staff shall provide the Board quarterly updates of the condition assessment program and upcoming planned condition assessment activities.

CONTRACT AMENDMENTS/CHANGE ORDERS

Bellevue 2 and Turkey Hill Water Tank Painting Project: Worldwide Industries Corp., Contract 7634, Change Order 7 (ref. W B.1)

Upon a motion duly made and seconded, it was

Voted: to authorize the Executive Director, on behalf of the Authority, to approve Change Order 7 to Contract 7634, Bellevue 2 and Turkey Hill Water Tank Painting Project, for an amount not to exceed \$250,000.00, increasing the contract from

\$4,150,249.17 to \$4,400,249.17, and extending the contract term by 60 calendar days from July 30, 2019 to September 28, 2019.

Further, it was voted: to authorize the Executive Director to approve additional change orders as may be needed to Contract 7634 in an amount not to exceed the aggregate of \$250,000, in accordance with the Management Policies and Procedures of the Board of Directors.

EXECUTIVE SESSION

It was moved to enter executive session to discuss real estate and litigation and thereafter to return to open session solely for the purpose of adjournment. Upon a motion duly made and seconded, a roll call vote was taken in which the members were recorded as follows:

<u>Yes</u>	<u>No</u>	<u>Abstain</u>
Carroll		
Cotter		
Flanagan		
Pappastergion		
Peña		
Vitale		
Walsh		

Voted: to enter executive session for the purpose of discussing strategy with respect to real estate and litigation in that such discussions may have a detrimental effect upon the litigation and negotiating positions of the Authority.

* * * *

EXECUTIVE SESSION

* * * *

The meeting returned to open session and adjourned at 1:38 p.m.

Approved: July 17, 2019

Attest:

Andrew M. Pappastergion, Secretary