



# 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

## **WATER POLICY & OVERSIGHT COMMITTEE MEETING**

to be held on

Wednesday, December 19, 2018

*Vice-Chair:* B. Peña  
*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 Containment Spill Response Program at Reservoirs
2. Emergency Water Supply to the Town of Burlington

#### **B. Contract Awards**

1. John J. Carroll Water Treatment Plant SCADA System Improvements, Design, Engineering Services During Construction and Resident Engineering Services: Arcadis U.S., Inc., Contract 7581
2. Intermediate High Water Pipeline Improvements, Design and Engineering Services During Construction: CDM Smith Inc., Contract 6955

#### **C. Contract Amendments/Change Orders**

1. Northern Intermediate High Redundant Pipeline Design, Construction Administration and Resident Inspection Services: Stantec Consulting Services, Inc., Contract 6906, Amendment 3

## **MASSACHUSETTS WATER RESOURCES AUTHORITY**

### Meeting of the

### Water Policy and Oversight Committee

November 14, 2018

A meeting of the Water Policy and Oversight Committee was held on November 14, 2018 at the Authority headquarters in Charlestown. Committee Vice Chair Peña presided. Present from the Board were Ms. Wolowicz and Messrs. Carroll, Cotter, Foti, Flanagan, Pappastergion, Vitale and Walsh. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, Corinne Barrett, Mark Johnson, Steven Cullen, Michele Gillen, Kathleen Murtagh, Stephen Estes-Smargiassi, William Sullivan, Bradley Palmer, Betsy Reilley, Russell Murray, Jeremiah Sheehan and Kristin MacDougall. The meeting was called to order at 10:33 a.m.

### **Information**

#### Update on Aqueduct Trails Program (Presentation)

The Committee recommended that this item be moved to the Board of Directors Meeting.

#### Update on Lead and Copper Rule Compliance

Staff presented an update on MWRA's compliance with the Lead and Copper Rule. There was discussion and questions and answers. Mr. Carroll requested an update on projected spending on MWRA's Lead Service Line Replacement Program. Mr. Vitale requested an update on drinking water quality issues in Flint, Michigan.

#### Wachusett Reservoir Lower Gatehouse Pipe Break

Staff made a presentation on the Wachusett Dam Lower Gatehouse pipe break and the interim measures to continue testing of the Wachusett Aqueduct Pump Station. Staff also advised the Board of a planned project to replace a generator at the Carroll

---

\* Committee recommendation approved by the Board on November 14, 2018

Water Treatment Plant. (Mr. Foti temporarily left the meeting during the presentation.). There was discussion and questions and answers.

### **Contract Awards**

#### **\* Technical Consulting Services to Implement Upgrades to the Water Quality Reporting System: Overture Partners, LLC, Bid WRA-4572Q, State Contract ITS63 Cat 2b**

Staff made a verbal presentation on the scope and benefits of a proposed contract to upgrade MWRA's water quality data reporting system. (Mr. Foti returned to the meeting during the presentation. Mr. Cotter temporarily left and returned to the meeting during the presentation.) There was discussion and questions and answers. (Messrs. Foti and Carroll temporarily left the meeting during discussion.)

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

### **Contract Amendments/Change Orders**

#### **\* Northern Intermediate High Section 110 – Stoneham, Albanese D&S Inc., Contract 7067, Change Order 3**

Staff made a presentation on the proposed change order. (Mr. Foti returned to the meeting during the presentation.)


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

The meeting adjourned at 11:14 a.m.

---

\* Committee recommendation approved by the Board on November 14, 2018

## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Update on Contaminant Spill Response Program at Reservoirs

---

**COMMITTEE:** Water Policy & Oversight

INFORMATION  
 VOTE

John J. Gregoire, Program Manager, Reservoir Operations  
Preparer/Title

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

---

### RECOMMENDATION:

For information only. This staff summary presents a periodic update on the plans, equipment and efforts for containment spill response at source and emergency reservoirs. A PowerPoint presentation, including drone footage of a recent Reservoir boom deployment exercise, will be presented at the meeting.

### DISCUSSION:

In order to mitigate the impact of accidental or intentional releases of petroleum and other vehicle fluid contaminants from watershed roads, MWRA staff maintain a Spill Response Program at source and emergency reservoirs. Equipment such as emergency response trailers, oil containment booms, and on-water response equipment are staged at critical locations. Annual professional training for personnel from MWRA operations, Department of Conservation and Recreation (DCR) Watershed Protection, and local fire departments on this equipment has evolved to include tributary fast-water boom deployment, terrestrial spills, boat operations, night and winter operations, personnel safety, and Incident Command System. Well trained and equipped MWRA and DCR personnel have responded to actual petroleum releases at reservoirs and in the watersheds, and have minimized the impact of these spills.

Equipment: The spill response program in place for the Quabbin Reservoir and the Wachusett Reservoir include different types of pre-positioned containment booms at strategic locations, mobile response trailers, and site-specific equipment staging. Permanent shoreline boom anchors have been placed at numerous strategic locations around the reservoirs for rapid connection of the boom to contain spills.

Types of containment booms in the inventory range from short 10-inch boom for fast-water deployments (photo below left) to 18-inch "harbor boom" such as that staged for Cosgrove Intake protection (photo below right), and up to 56-inch deep containment boom for open water applications. Also in inventory is a large quantity of floating fragment barriers for invasive plant



control, which can also be put into service as a floating petroleum containment boom. Booms are in lengths ranging from 10 feet to 100 feet to allow for a variety of applications. In addition, a large volume of petroleum-absorbent “sausage” boom is staged at all of these locations.

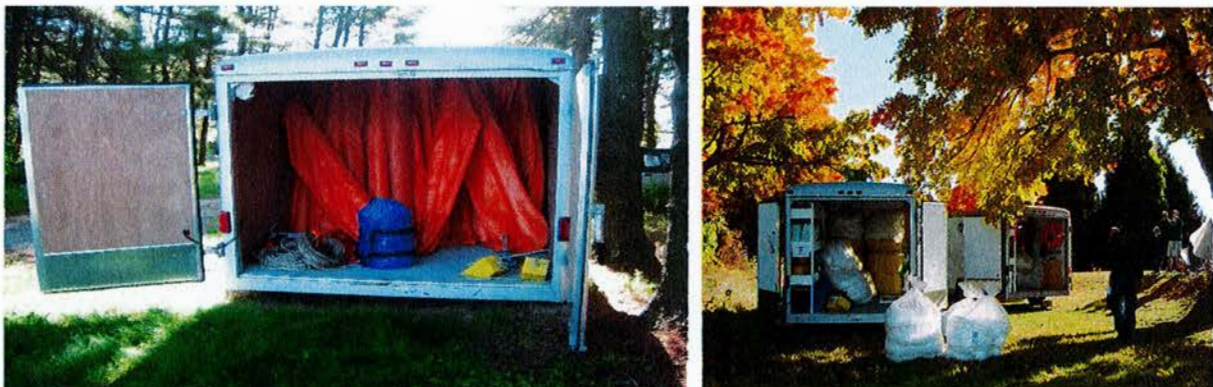


*Remote Quabbin boom shed (L) and staged boom at Wachusett near Cosgrove Intake (R)*

MWRA’s Shaft 8 Intake at the Ware River also includes pre-positioned equipment and trained MWRA personnel.

Boats: At both source reservoirs, DCR maintains several large and small boats, each equipped for towing boom and materials. At Wachusett, MWRA has a Water Quality Assurance boat and an algae treatment boat, both of which can be put into spill response service if needed. All boats are docked in the reservoirs or nearby on trailers in ice-free months. Most local fire departments have boats, which have participated in the spill response program. MWRA has purchased and provided special boom towing bridles for the local fire department boats. The MWRA Emergency Service Unit (ESU) maintains two boats for on-water spill response, one kept at Weston Reservoir and the other at Chelsea Facility.

Vehicles: MWRA-plated spill response trailers are staged at Quabbin Reservoir and Wachusett Reservoir and have hitches and pins that permit many vehicles to tow them, including MWRA, DCR, and local watershed fire department vehicles. MWRA ESU maintains two spill response/reservoir support trucks, as well as several trailers for different applications, both are kept at the Chelsea Facility.



*MWRA Boom Trailer (L) and On-water support Trailers (R)*



At the Wachusett Reservoir, special floating boom definition cans are anchored in the reservoir in front of Cosgrove Intake. In conjunction with shoreline anchor points, drills have shown that a spill containment boom can be deployed by boat to protect the intake in under 20 minutes.



*Shoreline anchor (L) and Boom enclosing Cosgrove Intake (R)*

Personnel: At the Quabbin and Wachusett Reservoirs, the primary personnel tasked with spill response are DCR staff given their close proximity. These staff come from the ranks of Watershed Maintenance, Environmental Quality, Civil Engineering, and Ranger sections. MWRA Western Operations personnel participate in all training. While the MWRA ESU spill response role is primarily focused on metropolitan area emergency reservoirs, and does periodic training on Spot Pond, ESU staff routinely participate at the source reservoirs training for added depth should additional personnel be needed. Outside organizations, such as watershed fire departments and DEP, also occasionally participate.

Training: MWRA arranges for training for all potential response staff using outside vendors. So far in FY19, eight training exercises have been provided at Quabbin, Wachusett, Ware River, and Spot Pond. Training includes hands-on exercises, boat operations, railroad release response and specific hazardous materials training.



*Watershed Tributary "fast water" boom exercise (L) and Reservoir spill containment (R)*



Actual Spill Responses: MWRA, DCR, and local fire department staff have successfully responded to a number of spills since the program began. A recent example occurred on November 20, 2018, when a Jeep Cherokee went off the road adjacent to the Ware Rive Intake in Barre. The driver was not severely injured, but the vehicle was totaled. Although there was no release threat to the intake, MWRA deployed boom and absorbent materials to the crash site (photo below left) to detain/absorb any vehicle fluids or petroleum release that could ultimately get into the Ware River.



*Vehicle crash into the Shaft 8 bypass canal*

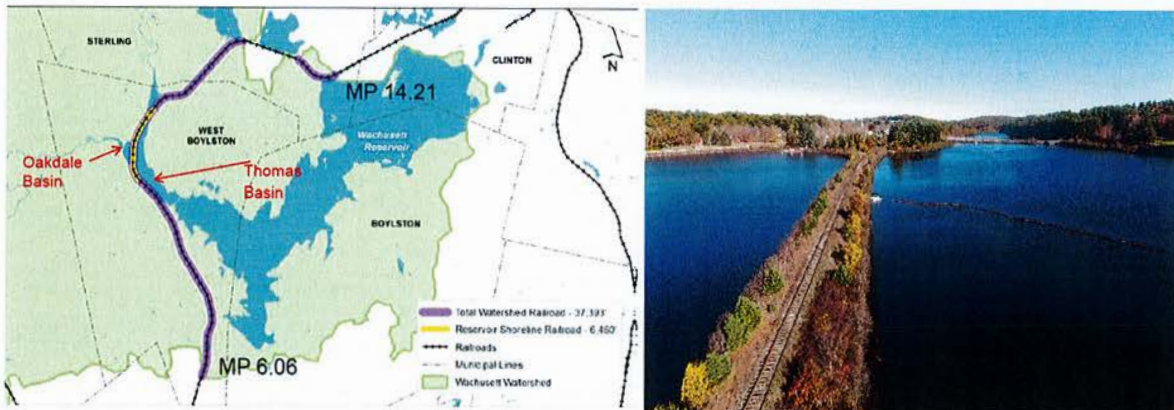
Elimination of direct discharges: DCR and MassDOT recently completed removal of 50 direct roadway stormwater discharges at Wachusett Reservoir through creation of detention and treatment basins (see photos below). Design was funded by MWRA through the Water Supply Protection Trust and managed by DCR. MassDOT funded the construction costs.





*Wachusett Reservoir Direct Discharge Elimination System basins*

**Remaining challenges:** The PanAm Railroad owns an 8-mile easement through the Wachusett watershed, including a 1-mile causeway across the lower basins of Wachusett Reservoir (photos below). This railroad was built in 1872, so the crossing predates the reservoir. This location presents response challenges to a train derailment since it has water on both sides.



*PanAm RR Track within Wachusett Reservoir watershed (L) and causeway (R)*

MWRA and DCR have conducted several railroad spill response drills and trainings including a multi-agency tabletop exercise in 2004, a field training on train car components at Pan Am's Ayer, MA rail yard in 2009, a railroad release tabletop and field exercise in 2015 and, more recently, a boom deployment exercise around the railroad track on the causeway (above photo) in 2017.



*DCR and MWRA staff at the 2015 Tabletop exercise*


Afterward, staff added a railroad release component to the MWRA professional training contract. Railroad release specific boom deployment training was done recently in 2016 and is scheduled under the current contract. Additionally, with PanAm cooperation, staff have tracked the materials that transit the watershed and developed a database to detail specific properties of materials upon release to the air, ground, or water. Further research into water treatment approaches to these materials is ongoing in an MWRA contract with UMass/Amherst Civil and Environmental Engineering Department.

**BUDGET/FISCAL IMPACT:**

The FY19 CEB includes funding for professional spill response training and for spill response equipment maintenance and upgrades. Equipment that is damaged, worn out or deployed (e.g., absorbents, personal protection gear, etc.) is replaced as needed.



## STAFF SUMMARY

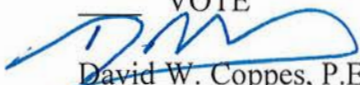
**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Emergency Water Supply Agreement with the Town of Burlington

---

**COMMITTEE:** Water Policy & Oversight

Mark Johnson, Director of Waterworks  
Beth Card, Director, Environmental and Regulatory Affairs  
Preparer/Title

X  INFORMATION  
VOTE

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

---

### RECOMMENDATION:

For information only. The Authority has authorized the Town of Burlington to temporarily utilize an emergency water supply connection via Lexington under the provisions for short-term approvals in #: OP.05: Emergency Water Supply Withdrawals.

### DISCUSSION:

On November 30, 2018, the Town of Burlington Department of Public Works submitted a request to MWRA for emergency withdrawal under MWRA's Operating Policy #: OP.05: Emergency Water Supply Withdrawals. This policy applies to communities outside MWRA's Water Service Area that are seeking MWRA water on an emergency basis. The MWRA may approve emergency withdrawals for no more than six months at a time, and typically, the emergency withdrawal period coincides with a DEP Declaration of Emergency for the Community. DEP's Declaration of Emergency was issued on December 10, 2018, and is attached.

The Town of Burlington has had on-going water supply issues and needs to do maintenance at its surface water treatment facility (Mill Pond). This work, requires a full plant shut down in order to remove sludge from the sedimentation basin. Burlington can receive MWRA water on an emergency basis via its existing interconnections with Lexington. The ability of Lexington to supply Burlington, even during periods of high demand, has previously been established in flow tests. It is anticipated that the connection may need to stay open for approximately seven days. Approval has been granted for a connection of no more than 30 days in the event that maintenance takes longer. If Burlington requests that the emergency approval be extended beyond the 30 days, approval from the MWRA Advisory Board and MWRA Board of Directors will be required before a six-month Emergency Water Supply Agreement is implemented.

### Emergency Water Supply Approval Criteria and Requirements

MWRA's emergency water use policy sets forth withdrawal criteria and requirements. The key components of the approval process are as follows:

- The Executive Director or the Chief Operating Officer is authorized to approve the emergency use of MWRA water through an existing or temporary connection to the MWRA or an MWRA water system community by a non-MWRA water system or facility for a period not to exceed thirty (30) calendar days;
- A DEP declaration of water supply emergency in the requesting community, or alternatively, submission by the community of documentation supporting the existence of conditions that could lead to a DEP declaration of water supply emergency per G.L.c21 G §15, is required for these emergency situations. Approval shall only be granted based on emergencies of non-chronic nature, such as supply and transmission disruptions;
- There must be no negative impact on MWRA's system and member communities;
- A long-term plan to remedy supply deficiencies must be developed;
- The applicant community does not use MWRA water supply as a chronic emergency back-up supply without equitable contribution for the fair asset value of the MWRA waterworks system; and
- The Community must submit a detailed description of water conservation and water accountability programs undertaken.

Staff have determined that each of these criteria and requirements have been met.

#### Status of Admission Process

On July 2, 2018, MWRA and Burlington staff met with regulatory agency staff in order to begin pursuit of approvals under MEPA and the Interbasin Transfer Act. Coordination with Burlington will be on-going in the year ahead. In October 2018, Burlington filed its Environmental Notification Form (ENF) with MEPA. MEPA has scheduled a scoping session on that filing for December 17, 2018, which will include MWRA staff, the Town of Burlington, and the regulatory agencies. Comments on that filing are due on December 28, 2018.

The Project will be completed in two phases. Phase 1 will supplement Burlington's current water system by providing approximately 1-million gallons-per-day (mgd) through a connection with Lexington and approximately 2,450 linear feet of new water main. Phase 2 will provide capacity for Burlington to be fully supplied by MWRA with an average day demand of 3.47 mgd and a maximum day demand of 6.45 mgd. Phase 2 contains two alternatives which would involve upgrading and replacing either a) approximately 16,300 feet of water main on Lowell Street in Lexington from the Arlington Town line to Adams Street in Burlington or b) approximately 19,800 feet of water main on Lowell Street in Lexington and North Street and Muller Road to Wheeler Road in Burlington. MWRA expects that its comments on the ENF will be supportive in nature and will relate to the Water System Expansion process, Water Quality, and MWRA Enabling Statute Section 8(m) Permitting.

**BUDGET/FISCAL IMPACT:**

Pursuant to #: OP.05, water taken for the fourth emergency withdrawal period is charged at the prevailing rate plus a 10% premium and an asset value contribution payment. MWRA will review actual use information to determine and assess the surcharge amounts. The volume of the emergency withdrawals and therefore the amount of revenue MWRA will receive cannot be projected at this time.

**ATTACHMENTS:**

DEP Emergency Declaration - December 10, 2018



Commonwealth of Massachusetts  
Executive Office of Energy & Environmental Affairs

# Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker  
Governor

Matthew A. Beaton  
Secretary

Karyn E. Polito  
Lieutenant Governor

Martin Suuberg  
Commissioner

**COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**In the Matter of )  
Town of Burlington )**

**Enforcement Number 00006128**

## **EMERGENCY DECLARATION**

### **The Parties**

1. The Massachusetts Department of Environmental Protection ("MassDEP") is a duly constituted agency of the Commonwealth of Massachusetts established pursuant to M.G.L. c. 21, § 7. MassDEP has its principal office located at One Winter Street, Boston, Massachusetts 02108, and its Northeast Regional Office located at 205B Lowell Street, Wilmington, Massachusetts 01887.
2. The Town of Burlington (the "Town") is a Municipality within the Commonwealth of Massachusetts having a principal place of business and a mailing address at 29 Center Street, Burlington, MA 01803.

### **Statement of Facts and Law**

3. The Town operates a public water system with MassDEP Registration number 3-15-048.01 and Permit Number 9P-3-15-048.01. The Town, by and through its Water Department, operates and maintains two water treatment facilities, one is the Vine Brook Treatment Facility, which treats groundwater from seven groundwater wells in the Vine Brook aquifer and has a full capacity of 3.2 MGD and the second is the Mill Pond Treatment Facility, which treats surface water that is pumped from the Shawsheen River in Billerica to the Mill Pond Reservoir in Burlington and has a full

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-6751.

TTY# MassRelay Service 1-800-439-2370

MassDEP Website: [www.mass.gov/dep](http://www.mass.gov/dep)

Printed on Recycled Paper

capacity of 4.5 MGD. To meet the new recommended maximum level for 1,4-dioxane, the Town took out of operation wells 3, 4, and 5 at the Vine Brook Treatment Facility in 2013.

4. On Friday, November 30, 2018, MassDEP received a letter from the Town, petitioning MassDEP for a declaration of a state of water emergency pursuant to M.G.L. c. 21G, § 15 and seeking to open its emergency connection with the Town of Lexington as soon as possible. In the letter, the Town stated that it was seeking the Emergency Declaration “[d]ue to the limited production capacity at the Vine Brook Treatment Plant caused by the 1,4, dioxane contamination of drinking water wells,” and “[t]he Mill Pond Facility requires full shut down in order to remove sludge from the sedimentation basin”. The Town also outlined that, although there is no outdoor watering this time of the year, the Vine Brook treatment facility is not sufficient to supply the distribution system while the Mill Pond Treatment Plant is off-line for maintenance because the Town’s winter demand is as high as 2.5 MGD. The Town further stated that activation of the connection to Lexington would allow the Town “to meet water demand while Mill Pond Treatment Facility undergoes maintenance.”
5. The Water Management Act, M.G.L. c.21G, § 15, and the Water Management Act Regulations, specifically the section set out at 310 CMR 36.40(1), authorize any water system to petition MassDEP for a Declaration of a State of Water Supply Emergency if it finds that there exists or impends a water supply shortage of a dimension which endangers the public health, safety or welfare.
6. Pursuant to M.G.L. c.21G, § 15 and the Water Management Act Regulations at 310 CMR 36.40(2), MassDEP may declare a state of water emergency if it finds that there exists or impends a water supply shortage of a dimension which endangers the public health, safety or welfare. Further, in response to a petition for a Declaration of a State of Water Supply Emergency and pursuant to this statutory section, MassDEP may require the water supplier to submit for its review and approval a plan for restraining the use of water by whatever means it deems appropriate and feasible. The statute limits any Declaration of a State of Water Supply Emergency to no more than six months in the aggregate in any twelve month period, unless MassDEP determines that a longer state of emergency is required to protect the public health.
7. Furthermore, the Water Management Regulations at 310 CMR 36.40(2) provides:

Upon receiving a petition for a declaration of a state of water supply emergency, the Department may declare an emergency if it finds that there exists or impends a water supply shortage of a dimension which endangers the public health, safety or welfare, due to circumstances including, but not limited to:

- (a) Demand for water exceeds the availability of water;

...



(d) Inadequate source of water, inadequate distribution system capacity, inadequate storage capacity or drought including seasonal water shortages which repeatedly affect the same public water system....

8. Pursuant to the Water Management Act, M.G.L. c.21G, § 17, MassDEP may issue orders during a state of water emergency declared under M.G.L. c.21G, § 15 to, among other things, establish priorities for the distribution of any water or quantity of water use, to permit any person engaged in the operation of a water supply system to cease the distribution of water, to distribute water to certain users as specified by MassDEP, and to require the implementation of specific water conservation measures.

### **Determination and Order**

9. For the reasons set forth above and pursuant to the Water Management Act, M.G.L. c.21G, § 15 and the Water Management Act Regulations, 310 CMR 36.00, MassDEP hereby determines that a water supply emergency exists and that it endangers the public health, safety or welfare of the citizens of the Town. Unless extended by MassDEP, this Emergency Declaration shall remain in effect until **June 9, 2019** or until such time as MassDEP determines that emergency conditions no longer exist, whichever is sooner.
10. By issuing this Emergency Declaration, MassDEP hereby grants the Town authority to use its emergency connection to the Town of Lexington, subject to the following specific conditions:
  - a. The Town shall maintain records of any water pumped from these sources as required under the Regulations during the duration of this Declaration and provide those records to the Department on request.
  - b. The Town shall comply with the requirements of the Massachusetts Water Resources Authority (MWRA) governing emergency use of connections with an MWRA community.
  - c. Changes in the use of sources such as the activation of a new interconnection may result in disturbances in the distribution system due to changes in flow volumes, flow patterns, and mechanical disruption. Impacts to the distribution system may include colored water, changes in chlorine demand and residuals, and potential health risks, such as bacterial contamination. A new interconnection may also change hydraulic conditions in the system, impacting the operation of tanks. Additionally, EPA has concluded that distribution maintenance can lead to lead scale disruption, which could cause an increase in drinking water lead concentrations. Given this information, MassDEP hereby requires the Town to conduct a full lead and copper sampling round during the June 1, 2019 -September 30, 2019 monitoring

period. Analytical results of said samples shall be reported in writing to MassDEP on or before October 10, 2019.


11. Effective immediately, the Town shall implement a ban on non-essential outside water use for the duration of this Emergency Declaration. For purposes of this Emergency Declaration, the term “nonessential outside water use” is defined to include those uses that do not have health or safety impacts, are not required by regulation, and are not needed to meet the core functions of a business or other organization.
12. **On or before February 1, 2019**, the Town shall submit to MassDEP a written report documenting all efforts taken by the Town to implement and enforce the ban on nonessential outside water use required herein, including all actions taken by the Town to inform the public of the ban and to enforce the ban, including the assessment of penalties or imposition of fines. The report shall describe water use trends over the period of the emergency and describe progress and the status of all other conservation programs being implemented by the Town, including any efforts to limit the use of private wells. The Town shall submit copies of all materials and notices prepared to inform the public of the need to conserve water and comply with the ban on nonessential outside water use.
13. The Town shall comply with all the remaining terms and conditions of its MassDEP Registration number 3-15-048.01 and Permit Number 9P-3-15-048.01 that remain unchanged by this Emergency Declaration.
14. If the Town fails to comply with the provisions of this Emergency Declaration, MassDEP may assess a civil administrative penalty as provided in M.G.L. c.21A, § 16 and M.G.L. c.21G, § 14. MassDEP may also seek civil judicial penalties as provided in M.G.L. c.21G, § 14. Each day of continued violation shall constitute a separate offense. In addition, MassDEP may ask the Attorney General to bring an action in the superior court to compel compliance with this Declaration.

Issued by the Department of Environmental Protection this 10<sup>th</sup> day of December 2018.

By \_\_\_\_\_


Eric S. Worrall, Regional Director

### STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** John J. Carroll Water Treatment Plant SCADA System Improvements, Design, Engineering Services During Construction and Resident Engineering Services  
Arcadis U.S., Inc.  
Contract 7581

**COMMITTEE:** Water Policy and Oversight

INFORMATION  
 VOTE

  
Michele S. Gillen  
Director of Administration

Mark H. Johnson, P.E., Director, Waterworks  
Augustin Serino, P.E., Manager, SCADA & Process Control  
John P. Beckley, P.E., Program Manager  
Preparer/Title

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

*Staff briefed the Board of Directors at the November 15, 2017 meeting regarding procurement options for selecting design consultants for the replacement of the supervisory control and data acquisition (SCADA) system equipment at the John J. Carroll Water Treatment Plant while protecting security sensitive information. Staff recommended a two-step procurement process at the December 20, 2017 meeting with provisions for protecting that information.*

#### RECOMMENDATION:

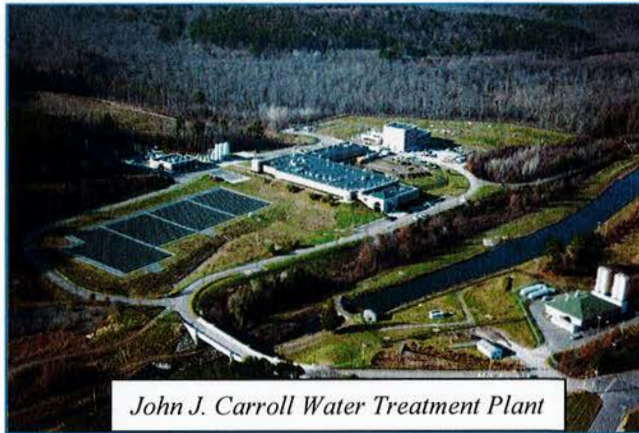
To approve the recommendation of the Consultant Selection Committee to award Contract 7581, John J. Carroll Water Treatment Plant SCADA System Improvements, Design, Engineering Services During Construction and Resident Engineering & Inspection Services to Arcadis U.S., Inc., and to authorize the Executive Director, on behalf of the Authority, to execute said contract in an amount not to exceed \$4,652,028.07, for a contract term of 52 months from the Notice to Proceed.

#### BACKGROUND:

The John J. Carroll Water Treatment Plant is located in Marlborough, Massachusetts and was placed into service in 2005. With a peak capacity of 405 MGD, the plant provides drinking water to nearly three million customers including the majority of residents and businesses in 45 metro west and greater Boston communities.



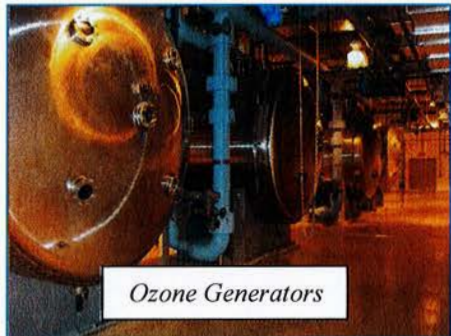
The plant utilizes ozone and ultraviolet light (UV) for primary disinfection, sodium hypochlorite and ammonia for secondary disinfection, and soda ash and carbon dioxide for corrosion control. Fluoride is added for dental health, and sodium bisulfite is added to quench ozone prior to UV disinfection. Flow through the plant, treatment processes and chemical feed systems are all automated through a Supervisory Control and Data Acquisition (SCADA) system.



*John J. Carroll Water Treatment Plant*

SCADA is a powerful process control architecture that consists of four main components: 1) field instruments, 2) programmable logic controllers (PLCs), 3) communication devices and media, and 4) host computers, software, and a graphical human machine interface. It allows an operator to control processes locally or at remote locations, monitor real-time data, directly interact with devices (sensors, valves, pumps, motors, etc.), optimize operations, and record facility data into a historian.

The Carroll Plant is in operation 24 hours a day, seven days a week and the SCADA system is essential to maintaining continuous operation of the facility. A plant-wide network of 34 PLCs is



*Ozone Generators*

linked to a centralized operations control center that provides a single point of control for MWRA staff to adjust treatment parameters and monitor plant performance. The control system performs calculations to ensure the ozone and UV processes meet mandated disinfection requirements, as well as data collection for regulatory reporting and record keeping. A communication network enables the SCADA system to integrate with remote facilities, such as the Cosgrove Intake and Norumbega Covered Storage Facility, to manage flow into and out of the treatment plant.

The current SCADA control equipment is reaching the end of its useful life and future vendor support for the installed PLC base is no longer guaranteed. Critical components, such as backup scanner modules, have been discontinued and when MWRA's current stock of spare parts is exhausted, maintenance of the system will become increasingly difficult. Advances in control system technology have resulted in new PLC models with improved security provisions, increased system robustness and enhanced maintenance features. Contract 7581 will allow the MWRA to replace legacy equipment at the Carroll Plant, implement updated control system standards to enhance redundancy, ensure future reliability, and maintain secure plant operations.

## **DISCUSSION:**

Contract 7581 will provide evaluation, preliminary and final design, integration services (PLC programming, graphics development, communication configuration), training, construction administration and resident inspection services to replace the existing SCADA equipment and systems that automate, monitor, and control the Carroll Plant.

Work will include replacing 16 instrumentation panels equipped with legacy PLCs that are the core of the treatment facility control system. These panels are in continuous operation and the sequence of cutting over to the new equipment without interruption to plant operations is a key project constraint. A significant component of the construction phase services is the programming required to convert the PLC logic to the new control platform and the testing to ensure system functionality is maintained. Updated control screens and high performance graphics are to be developed by the Consultant as part of the project.

A new fiber optic communication network will also be constructed, linking all control systems to the control room. This will facilitate the transition from the existing equipment, eliminate capacity bottlenecks, and harden security against cyber intrusion and other threats.

Currently, complex SCADA maintenance activities require short duration nighttime plant shutdowns to perform the work. The scope includes provisions to allow control equipment to be taken out of service for maintenance without requiring a full plant shutdown in the future. This will include modifying equipment to operate without the use of the SCADA system by installing dedicated local controllers.

The operations control room is equipped with legacy operator interface equipment. The work includes replacing SCADA displays and providing new consoles to house the larger sized equipment. The design will also evaluate data storage systems, computer hardware and replace instrumentation panel battery backup systems.

Design and bidding of the construction contract is estimated to take 16 months. Construction is estimated to take 24 months due to equipment lead times and constraints related to sequencing of portions of the work, followed by 12 months of warranty period.

## **Procurement Process**

A request for qualifications (RFQ) was issued on February 2, 2018, with requirements for execution of confidentiality agreements and vetting of the Consultant's staff with access to the sensitive information through the FBI and Fusion Center. The RFQ was publicly advertised and 21 firms were notified. The RFQ deadline of March 19, 2018, closed with a single response from the Consulting firm, Arcadis, U.S. Inc. (Arcadis).



In an effort to increase the number of bidders and encourage competition, the RFQ was cancelled, the Arcadis qualification statement returned un-opened, and the project re-issued. MWRA re-advertised the RFQ, reissued it on April 17, 2018, and directly solicited 51 firms, of which 19 requested copies of the RFQ. MWRA received two responses on May 25, 2018, from Arcadis and Weston Technology Solutions. Four firms provided notice declining to submit and others indicated the work was too specialized, they did not have the appropriate staff or resources, or they wanted to team with larger firms.

Both Arcadis and Weston were determined to have met the requirements outlined in the RFQ and invited to submit proposals at the second stage of the selection process. Prior to issuing the RFP documentation, each firm was required to satisfy the security provisions of the selection process. This required an extended schedule to allow for the submission of confidentiality agreements and for the FBI and Fusion Center to vet the consultant’s proposed staff.

The RFP included the following evaluation criteria: Cost - 25 points; Qualifications and Key Personnel - 25 points; Technical Approach -24 points; Capacity/Organization and Management Approach - 23 points; and MBE/WBE participation - 3 points.

A pre-proposal conference and site visit was held at the Carroll Plant on September 9, 2018, which was attended by representatives from both of the shortlisted firms. Proposals were due on October 23, 2018, and MWRA received just one response from Arcadis. Staff contacted Weston to inquire why they elected not to submit a proposal. Weston indicated that after the site visit they were not confident they would be selected and stated they would have been more likely to propose if the procurement process was qualification based with less emphasis on cost.

The proposed cost and level of effort by Arcadis is as follows:

PROPOSER	PROPOSED CONTRACT COST	LEVEL OF EFFORT
<i>Engineer’s Estimate</i>	\$5,462,883	32,152
Arcadis, U.S., Inc.	\$4,652,028	34,720

The Selection Committee reviewed and scored the proposal with a sum of 404 points awarded out of a total of 500 available.

Arcadis presented a very strong proposal demonstrating it has the qualifications, experience, past performance, technical approach, and capacity to do the work. The project director, project engineer, and programming staff are based in Massachusetts and meet or exceed the qualifications required. The qualifications of Arcadis technical staff are very high and the Arcadis SCADA design experience is very applicable to this project. The subconsultant, Aztec Technologies, is a valuable addition to the team and has direct experience with the John J. Carroll Plant, Gillis Pump Station, and other MWRA projects. It is currently involved with programming at the Chelsea Creek Headworks.

Arcadis' total project level of effort was 7.9 % higher than the engineer's estimate. The difference was largely due to Arcadis including more hours for the design phase tasks, with the majority of this additional time accounted for in field investigation, QA/QC, and project management. The Engineering Services During Construction level of effort was within 1% of the engineer's estimate. Both Arcadis and the subconsultant Aztec are utilizing overseas labor as a direct cost, and as a result, the overall project budget is approximately \$800,000 lower than the engineer's estimate.

Staff met with Arcadis to confirm and gain a better understanding of the proposed costs and level of effort. Due to complexity of the design and experience with this type of work, staff are of the opinion that Arcadis' proposal reflects the costs and hours required for this project. Arcadis is aware of the challenges and constraints of maintaining plant operation while transitioning to the new control system and these have been built into the project schedule. The security concerns related to sharing sensitive information have been acknowledged and Arcadis will take appropriate steps to cooperate with MWRA to safeguard this information. This includes vetting both U.S. and overseas employees involved with the project. Arcadis expressed confidence that it could complete the work for the price proposed.

Although Arcadis is the sole proposer for this project, the proposal was solicited in a competitive process and the level of effort is comparable with the engineer's estimate. Staff determined that Arcadis submitted a high quality proposal with a qualified engineering team, excellent technical approach, and proven prior experience working on equivalent projects, and an appropriate level of effort for this project.

Based on the reasons set forth above, the Selection Committee recommends the award of this contract to Arcadis, U.S. Inc., in an amount not to exceed \$4,652,028.07.

**BUDGET/FISCAL IMPACT:**

The FY19 CIP includes a budget of \$4,100,000 for Contract 7581. The contract award amount is \$4,625,028.07 or \$525,028.07 over budget. This amount will be accounted for within the five-year CIP spending cap.

**MBE/WBE PARTICIPATION:**

No minimum MBE and WBE participation requirements were established for this project; however, Arcadis has committed to 15.09% MBE participation.

## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director  
**DATE:** December 19, 2018  
**SUBJECT:** Intermediate High Pipeline Improvements  
Design and Engineering Services During Construction  
CDM Smith Inc.  
Contract 6955




**COMMITTEE:** Water Policy & Oversight

       INFORMATION  
  X   VOTE

  
Michele S. Gillen

Director of Administration

Michael G. Rivard, P.E., Program Manager  
John Colbert, P.E., Acting Chief Engineer  
Preparer/Title

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

### RECOMMENDATION:

To approve the recommendation of the Consultant Selection Committee to award Contract 6955, Intermediate High Pipeline Improvements Design and Engineering Services During Construction to CDM Smith Inc., and to authorize the Executive Director, on behalf of the Authority, to execute said contract in an amount not to exceed \$6,451,907, for a contract term of 90 months from the Notice to Proceed.

### BACKGROUND:

The Intermediate High water service area consists of two geographically distinct and hydraulically unconnected areas, both served at a grade line of 320 feet Boston City Base (see Figure 1).

The southern area serves most of the City of Newton lying south of the Massachusetts Turnpike. This area is supplied by the Commonwealth Avenue Pumping Station, which takes suction from Shaft 6 of the City Tunnel and pumps to the city-owned Newton Covered Storage Reservoir on Waban Hill. The second area is further north and serves portions of Arlington, Belmont, and Watertown. This area is supplied by the Belmont Pump Station, which takes suction from WASM 3 and pumps to the Arlington Covered Reservoir.

A single 83 year-old, 20-inch diameter cast iron

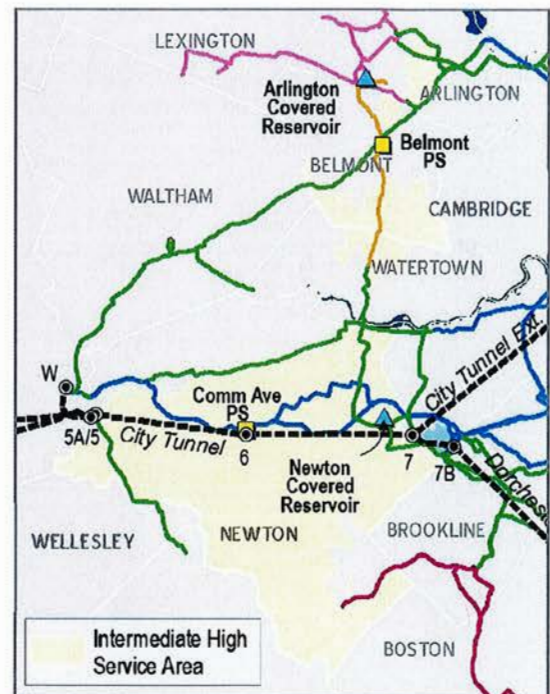


Figure 1 - Intermediate High Service Area

pipeline (Section 59) connects the Arlington Covered Reservoir to the Belmont Pump Station and to the Belmont and Watertown meters. This pipe cannot be taken out of service for rehabilitation; if there were a failure on any portion of this pipe, portions of Watertown and Belmont would lose water service.

The rehabilitation of other portions of Sections 24, 47, and Section 23 to the south are included in a separate design contract that is currently at 100% design. A separate construction contract will be awarded within the next year to rehabilitate or replace these pipelines that connect this project to Shafts 7 and 7B of the City Tunnel. The rehabilitation of Sections 24 and 47 were split between two design contracts so that impacts to the Watertown meters could be mitigated while other work on MWRA's Watertown Section is completed.

## **DISCUSSION:**

This project includes the design and engineering services during construction to interconnect the two Intermediate High water service areas to provide redundancy and operational flexibility in the event of pipe failures. This project also includes rehabilitation and replacement of old unlined cast iron pipes in the service area. Interconnection of the two Intermediate High service areas requires the following key project elements (see Attachment 1):

### Construction Contract 1

- Installation of approximately 5,000 feet of new 30-inch diameter pipe extending Section 75 in Newton. This new pipeline will interconnect Commonwealth Avenue Pump Station with Section 24 on Waverly Avenue in Newton.
- Replacement of Meter 111 and addition of a new Master Meter on Section 24 to measure flow from the Commonwealth Avenue Pump Station to the unified Intermediate High service area.

### Construction Contract 2

- Replacement of Section 25 in Watertown with 4,900 feet of new 20-inch diameter pipe to deliver water at Intermediate High grade line to Section 59 to improve hydraulic capacity of the system and ensure reliable service.
- Replacement of Meter 40 Watertown including a new pressure reducing valve and Meter 2 Watertown.

### Construction Contract 3

- Rehabilitation by cleaning and cement mortar lining and/or replacement of 16,400 feet of Sections 59 and 60, 20-inch diameter cast iron pipe, including new valves, meters (110 Belmont and 121 Arlington), and appurtenances to improve hydraulic capacity, improve water quality, and ensure reliable service.
- Rehabilitation and/or replacement by cleaning and cement mortar lining of 3,300 feet of Section 24, 20-inch diameter cast iron pipe, in Newton and Watertown to supply Intermediate High hydraulic grade line, to improve hydraulic capacity, improve water quality, and ensure reliable service.

- Rehabilitation by cleaning and cement mortar lining of 2,000 feet of Section 47, 20-inch and 16-inch diameter cast iron pipe to regain hydraulic capacity, improve water quality, and ensure reliable service.
- Replacement of Watertown Meter 81.

The work will be sequenced and implemented to maintain service during construction and ensure the timely completion of the work in coordination with other phases of this project and other MWRA or community projects.

This contract will also provide biddable contract documents for three construction contracts to be publicly bid under Chapter 30 of the Massachusetts General Laws.

The total project duration is 90 months including 12 months of warranty services.

**Procurement Process**

On September 26, 2018, MWRA issued a one-step Request for Qualifications Statements/Proposals (RFQ/P) that was publicly advertised in the Central Register, Boston Herald, Banner Publications and El Mundo. In addition, notice was sent directly to over 30 engineering firms; 18 firms requested copies of the RFQ/P.

The following criteria were used to evaluate each of the proposals: 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), and MBE/WBE Participation (5 points).

MWRA received two proposals on November 9, 2018 from CDM Smith Inc. and Black & Veatch Corporation.

The proposal costs and levels of effort are presented below:

	<b><u>Proposed Contract Cost</u></b>	<b><u>Level of Effort</u></b>
<b>CDM Smith</b>	<b>\$6,451,907*</b>	<b>35,428 hours</b>
Black & Veatch	\$6,552,981	39,689 hours
<i>Engineer's Estimate</i>	<i>\$4,607,420</i>	<i>27,858 hours</i>

\* Contract cost adjusted to correct errors.

Staff reviewed the original engineer's estimate after receiving the proposals, which was 28.6% lower than the CDM Smith proposal. Staff have determined that the higher level of effort proposed by both firms is consistent with multiple overlapping designs and construction contracts in multiple communities requiring additional staff, since phases are concurrent. Both firms assigned two project engineers to work on the design and ESDC services in order to meet the schedule requirements to overlap design and construction packages, and coordinate with five communities.



The costs proposed were higher than anticipated for the following reasons:

- Additional 4,200 hours or approximately \$540,000 for two project engineers vs. one project engineer in the Engineer's Estimate;
- Higher field program costs (\$160,000) due to higher drilling and mobilization costs;
- Higher subsurface investigation costs (approximately \$400,000) that were not included in the Engineer's Estimate;
- Additional hours in the Engineering Service During Construction tasks (approximately 2,700 hours or \$380,000) to provide timely services for multiple ongoing construction projects due to overlap in the schedules; and
- Higher consultant hourly rates consistent with the upward trend in the engineering consultant costs currently seen in the marketplace due to the significant engineering work on-going in the Boston area (approximately \$280,000).

Adding in these five items results in cost and level of effort closer to the proposed costs received from both CDM Smith and Black & Veatch.

The Selection Committee determined that CDM Smith presented very strong qualifications, experience and past performance, technical and management approach, and presented the best overall value of the two proposals. The CDM Smith team will be led by a project manager with significant experience working on rehabilitation and replacement of water mains in the 20 to 30-inch diameter range. CDM Smith proposed a lower total cost than Black & Veatch with a slightly lower indirect cost rate. CDM Smith's cost per hour was slightly higher, but was indicative of the inclusion of a proportionally larger number of hours for the Project Engineer category versus the Engineer category when compared to the Black & Veatch proposal. The use of CDM's more experienced staff for this project was viewed favorably by the Selection Committee to provide a better design than Black & Veatch's proposal that included more hours with less experienced engineers. Overall, CDM Smith proposed 4,261 hours less than Black & Veatch; however, staff believe the level of effort is appropriate and the distribution of hours across labor categories is well proportioned.

CDM Smith provided examples of highly relevant projects with comparable scope and size, and references for these projects were favorable with all interviewees indicating they would rehire the firm. The qualifications of the key personnel proposed are excellent overall, and include a very experienced team for the key technical roles of the project. The Technical Approach was thorough and anticipated potential solutions and recommendations for evaluation of new pipeline routes and for evaluating pipe for rehabilitation. CDM Smith exceeded the MBE and WBE participation requirements. The selection committee agreed that CDM Smith provided the best overall proposal.

The Selection Committee determined that Black & Veatch presented a well-qualified team, provided good examples of relevant experience and indicated that it has the capacity to take on the project. Black & Veatch proposed more hours than CDM Smith, but the hours were disproportionately distributed to less experienced staff, with fewer hours assigned to key personnel. The use of less experienced staff was considered a significant weakness in the Black & Veatch proposal. The description of the proposed technical approach was general, and could have included additional detail to demonstrate insight into the project's challenges.

The five voting members on the Selection Committee scored and ranked the proposals as follows:

Selection Committee Results	Total Points	Order of Preference Total Score*	Final Ranking
CDM Smith	413.5	6	1
Black & Veatch	394	9	2

\*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.

Staff determined that CDM Smith submitted an excellent proposal with a highly qualified team, proven experience on directly relevant projects, a detailed technical approach that reflected the Authority's goals, and an appropriate level of effort for the project.

Based on final rankings and the reasons set forth above, the Selection Committee recommends award of this contract to CDM Smith in an amount not-to-exceed \$6,451,907.

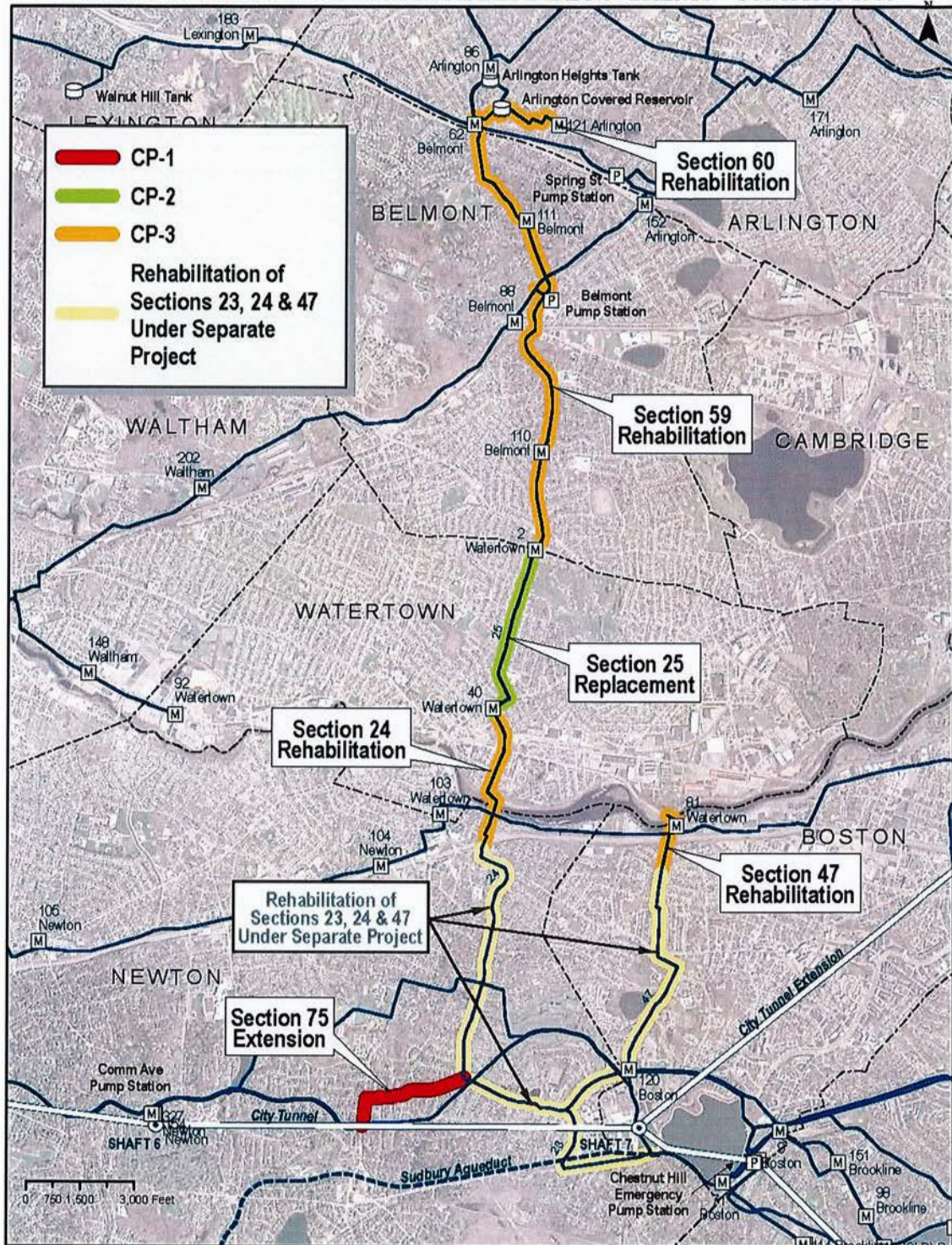
**BUDGET/FISCAL IMPACT:**

The FY19 CIP includes a budget of \$2,697,000 for Contract 6955. The contract award amount is \$6,451,907 or \$3,754,907 over budget. This amount will be absorbed within the five-year CIP spending cap.

**MBE/WBE PARTICIPATION:**


The minimum MBE and WBE participation requirements for this project were established at 7.18% and 5.77%, respectively. CDM Smith has committed to 28.4% MBE and 7.76% WBE participation.

ATTACHMENT 1: INTERMEDIATE HIGH PIPELINE IMPROVEMENTS – CONTRACT 6955





**STAFF SUMMARY**


**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Northern Intermediate High Redundant Pipeline Design, Construction  
Administration and Resident Inspection Services  
Stantec Consulting Services, Inc.  
Contract 6906, Amendment 3

---

**COMMITTEE:** Water Policy & Oversight

         INFORMATION  
  X   VOTE

Patrick T. Barrett, Program Manager  
John Colbert, P.E., Acting Chief Engineer  
Preparer/Title

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

---

**RECOMMENDATION:**

To authorize the Executive Director, on behalf of the Authority, to approve Amendment 3 to Contract 6906, Northern Intermediate High Redundant Pipeline Design, Construction Administration and Resident Inspection Services, with Stantec Consulting Services, Inc., which includes settlement of certain claims, increasing the contract amount by \$468,000.00, from \$6,323,234.84 to \$6,791,234.84, with no increase in contract duration.

**BACKGROUND:**

MWRA's Northern Intermediate High service area provides water to the communities of Reading, Stoneham, Wakefield, Wilmington, Winchester, and Woburn through a single 48-inch pipeline, which is fed by the Gillis Pump Station at Spot Pond in Stoneham. Although some of these communities are partially served by MWRA, the loss of this single transmission main would result in a rapid loss of service to Reading, Stoneham, and Woburn, and potential water restrictions in Wakefield, Wilmington, and Winchester.

The main pipeline that serves this area (Section 89) is a three-mile-long, four-foot-diameter, pre-stressed concrete cylinder pipe (PCCP) transmission main with no redundancy other than the low-capacity, century-old Section 29 that parallels its route for a short distance. The 10,500-foot length of Section 89 northwest of Spot Pond is constructed of PCCP with Class IV reinforcing wire, which was used by the now defunct Interpace Corporation for a short period of time in the 1970s. It has been well documented, based upon catastrophic pipe failures elsewhere in the country, that Class IV reinforcing wire is susceptible to hydrogen embrittlement, which can lead to premature pipe failure. In addition, records indicate that this portion of the Section 89 pipe was manufactured at Interpace's Hudson, New York Plant during a window of time when the concrete coating over the Class IV reinforcing wires was defective, leading to cracking and spalling, which can accelerate the corrosion of the reinforcing wires. Due to the lack of redundancy, Section 89 cannot be taken

out of service for inspection or for repairs. The project's goal is to design and construct a new pipeline that will provide redundancy to the community meters so that Section 89 can be removed from service for inspection and rehabilitation.

On March 16, 2011, the Board approved the award of Contract 6906 to Fay, Spofford & Thorndike, LLC, now Stantec Consulting Services Inc. for Design, Construction Administration, and Resident Inspection Services for the construction of a proposed 48-inch pipeline seven miles long, extending from Gillis Pump Station to Meter 229 – Wakefield, and a 36-inch pipeline, extending from Meter 229 through Stoneham and Reading to a looped connection with the north end of the existing pipeline in Woburn. The total estimated cost of the new pipeline is \$55.7 million, as included in the FY19 CIP.

On February 12, 2014, the Board of Directors authorized Amendment 1 in the amount of \$778,000 for additional investigations for alternative route analysis. On January 18, 2017, the Board authorized Amendment 2 in the amount of \$900,854 for a 39-month time extension, additional level of effort and project administration associated with the time extension. Engineering Services During Construction and Resident Engineering Services were also increased to provide services for four construction contracts rather than two.

## **DISCUSSION:**

The project design originally included the bidding of two separate construction contracts. However, in coordination with the Town of Reading, Town of Stoneham and MassDOT, the project is being completed with four construction contracts as follows:

- The first construction contract, Contract 7066, consists of 2,400 linear feet of 36-inch water transmission main in the Town of Reading, which was expedited and coordinated with the MassDOT road reconstruction project on West Street. This contract was completed in May 2015.
- The second construction contract, Contract 7471 consists of the construction of 8,800 linear feet of 36-inch water transmission main in the City of Woburn and the Town of Reading. This contract was completed in May 2018.
- The third construction contract, Contract 7478, consists of the construction of 7,800 linear feet of 48-inch diameter transmission main in the Town of Stoneham and 2,600 linear feet of 16 and 12-inch diameter transmission main to service Wakefield Meter 96. This contract was completed in September 2018.
- The fourth construction contract, Contract 7067, consists of the construction of 14,000 linear feet of 48-inch diameter transmission main in the Town of Stoneham. This contract was issued a Notice to proceed in January 2018 and is scheduled to be completed June 2020.

## **Settlement Agreement**

An error relating to the design of a drain line in Oak Street in Reading on Construction Contract 7471 resulted in significant rework in the amount of \$335,801, along with community impacts. The MWRA claims there were seven additional errors/omissions on Contract 6906, 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 the additional items to be approximately \$29,371, for a total of \$365,172 on \$45.3 million spent to date on construction. Stantec claims that, given the total value and scope of the project, the low value of errors/omissions and its overall good performance on this Contract, that the level of errors/omissions are within the standard of care for similar scope of design services. Balancing the impact of the drain line error and Stantec's overall performance on this Contract, which has been good, staff recommend settlement of the above claims for \$80,000. This sum will offset Stantec's additional costs set forth below. If Amendment 3 is approved, MWRA will execute a settlement agreement with Stantec.

### **This Amendment**

Amendment 3 is for additional Engineering Services During Construction for out of scope engineering services and changes to drawings to reflect these changes. The following is a summary of these changes.

**Out of Scope Changes: \$285,500**

A number of out of scope changes have caused the Task 3 Engineering Services During Construction budget to be expended at an accelerated rate. These additional levels of effort required for out of scope changes to maintain the project schedule for the construction of Section 110 have included the following:

#### Meter Vault Modifications

Stantec designed control valve vaults downstream of the MWRA meters in the Town of Reading. During installation of the vaults, the Town of Reading requested additional design components including dehumidification, venting, dewatering sump, instrumentation repeater panel, and remote/local operation controls to match the Town's existing meter vault installation. These items were constructed by change order.

Stantec provided design of the new water revenue Meter 122 in the Town of Stoneham as part of the Memorandum of Agreement between MWRA and the Town of Stoneham. During installation of the vault, a relocated gas main required the shifting of the vault location, which impacted the curb line. Corrective action to replace the curb initiated the need to comply with ADA regulations, which required redesign of the intersection crosswalk alignment.

#### Contractor Support

The consultant team was called on to provide additional support during contractor leak detection/pipe reassembly in sections of completed work during the testing and repair of the 48-inch Section 110 transmission line installation, under Construction contract 7478.

The Contractor requested a change in pipeline elevation in order to decrease ledge removal quantities and accelerate the construction progress schedule. This design change required re-engineering the water main to minimize utility conflicts, which were avoided in the deeper original design. This change provided MWRA with construction cost savings of \$121,000 under construction contract 7478.



### Unforeseen Conditions

During the earliest construction contract (7066), the Contractor discovered voids in the trench excavation, which required geotechnical investigations to determine the cause and remedy, as well as to allow safe installation of the new MWRA water main. During this construction, a previously unidentified hazardous materials contamination site was also exposed, which required the consultant to design a hazardous materials remediation plan that was implemented by the contractor through a change order.

Stantec provided additional engineering effort to support design for the relocation of the MWRA water main due to a previously unidentified drain line in Maple Street, Stoneham.

### Operational Improvements

MWRA operations staff have had ongoing discussions with other regional water suppliers and the Department of Environmental Protection as how best to comply with guidelines for automatic air valve vent lines. Based on these discussion, design revisions to MWRA's standard for automatic air valves were implemented after award of the NIH construction contracts. These revisions represent a balanced compliance with DEP guidelines and actual field conditions, including depth of cover, depth of pipe, conflicts with surrounding utilities and MWRA's ability to provide future maintenance of air valves.

As part of contract 7471, it was determined during construction that the internal two-inch by-pass on the main line valves were insufficient for MWRA's operational concerns. A six-inch by-pass pipe was designed and incorporated into the construction contract by change order. As a lesson learned, this aspect of valve design was carried through in subsequent design/construction packages.

As part of lessons learned from another MWRA water transmission mains project, the pipe restraint system on the NIH Section 110 was reviewed to ensure conservative thrust restraint was included in the design. This review resulted in changes to the early construction contracts by change order and applied to later designs. The new design required that a restrained pipe greater than 36-inch diameter with a fitting deflection of 45-degrees or greater should incorporate a thrust block into the design to prevent movement of the pipeline.

MWRA water meter 96 was designed and installed 1,000 feet past the Wakefield town line and included 1,600 feet of 12-inch water main to provide a hydraulically sound connection point. At the suggestion of the Town of Wakefield, MWRA added to the design the replacement of the 1,000 feet of six-inch water main with eight-inch water main. This improved pipeline serves as an emergency connection between the Town of Stoneham and the Town of Wakefield, which will improve capabilities for isolation of the MWRA pipeline without impacting local supply. This work was completed by change order during construction.

### Additional Community Coordination

The consultant budget provided for monthly construction progress meetings. Due to the extensive community impacts, the Town of Stoneham required bi-monthly progress meetings instead of

monthly meetings. Recently, meetings have been cut back to every third week. Additional coordination meetings continue to be necessary due to Eversource gas leaks adjacent to blasting zones.

Stantec's proposed cost for the additional scope items for Engineering Services During Construction is \$365,500. This sum is offset by the \$80,000 in compensation for the Oak Street drain line design error, resulting in an amendment amount of \$285,500 for these services.

**Additional Local Record Drawings: \$137,500**

As part of Construction Contracts 7066, 7471, 7478 and 7067 the MWRA will have replaced/relocated approximately 18,750 feet of local water, sewer, drain piping, Meter 122 and Reading control valve vaults. MWRA has agreed to provide the local affected communities with updated record drawings of the replaced/relocated local utilities since the changes to the community pipelines and drawings are significant and beyond the normal pipeline construction contract impact.

**Re-Stationing of Section 110: \$45,000**

MWRA Section 110 has been installed under multiple construction contracts with two different design consultants. To provide a logically stationed mapping system and consistently numbered valves and appurtenances for Section 110, these associated record drawings and detail record drawings will be revised and re-sequenced. This additional effort will restation Section 110 from Gillis Pump Station to Woburn Meter 240, which is 35,600 linear feet of Water Main.

**CONTRACT SUMMARY:**

	<u>Amount</u>	<u>Time</u>	<u>Dated</u>
Original Contract:	\$4,644,380.84	2,376 Days	03/23/11
Amendment 1:	\$778,000.00	0 Days	12/01/14
Amendment 2	\$ 900,854.00	1,187 Days	07/18/17
Amendment 3	<u>\$ 468,000.00</u>	<u>0 Days</u>	Pending
Total of Amendments	\$2,146,854.00	1,187 Days	
Amended Contract:	\$6,791,234.84	3,563 Days	

The percentage of amendments for this contract is 46.2% of the original contract value.

**BUDGET/FISCAL IMPACT:**

The FY19 CIP includes a budget of \$6,323,235 for Contract 6906. Including this amendment for \$468,000, the adjusted subphase total will be \$6,791,234.84 or \$467,999.84 over budget. This amount will be absorbed within the five-year CIP spending cap.

**MBE/WBE PARTICIPATION:**

The minimum MBE and WBE participation requirements for this project were established at 7.18% and 5.77%, respectively. Stantec has committed to 25.83% MBE and 12.04% WBE participation.



# 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

## PERSONNEL & COMPENSATION COMMITTEE MEETING

to be held on

Wednesday, December 19, 2018

*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 – December 2018
2. Appointment of Budget Director, Finance Division
3. Appointment of Chief Engineer
4. Appointment of Assistant Director Engineering, Engineering & Construction
5. Appointment of Manager of Design, Tunnel Redundancy
6. Appointment of Manager, Geotechnical and Tunneling, Tunnel Redundancy

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Meeting of the

### Personnel and Compensation Committee

November 14, 2018

A meeting of the Personnel and Compensation Committee was held on November 14, 2018 at the Authority headquarters in Charlestown. Committee Chair Wolowicz presided. Present from the Board were Messrs. Carroll, Cotter, Flanagan, Foti, Pappastergion, Peña, Vitale and Walsh. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, Michele Gillen, Andrea Murphy and Kristin MacDougall. The meeting was called to order at 11:14 a.m.

### **Approvals**

#### \* PCR Amendments – November, 2018

Staff made a verbal presentation on the proposed PCR Amendments.

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

#### \* Appointment of Business Systems Analyst III, MIS Department

Staff made a verbal presentation on the proposed appointment.

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

#### \* Appointment of Budget Manager, Finance Division

Staff made a verbal presentation on the proposed appointment. There was brief discussion and questions and answers.

The Committee recommended approval. (ref. P&C A.3.)

#### \* Appointment of Manager, Finance and Administration, Operations Division

Staff made a verbal presentation on the proposed appointment. There was brief discussion and questions and answers. (Mr. Carroll returned to the meeting during discussion.)

The Committee recommended approval. (ref. P&C A.4.)

The meeting adjourned at 11:19 p.m.

---

\* Committee recommendation approved by the Board on November 14, 2018

## STAFF SUMMARY

**TO:** Board of Director  
**FROM:** Frederick A. Laskey, Executive Director  
**DATE:** December 19, 2018  
**SUBJECT:** December 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.

### December PCR Amendments

The five PCR changes include one position in the Affirmative Action Compliance Unit to accurately reflect the nature of the job duties and the addition of one new position to meet staffing needs. The Administration Division amendments reflects changing two positions to accurately reflect the nature of the job duties. The Operations Division amendment reflects the addition of one new position to address staffing needs.

The amendments are:

#### Affirmative Action Compliance Unit Organizational Changes

The promulgation of new employment laws and legislation including the Pregnant Workers Fairness Act and the Massachusetts Pay Equity Act as well as the increased attention on sexual harassment as focused within the "Me Too" movement have dramatically increased the level of employee complaints and requests for information from the Special Assistant, Affirmative Action and Compliance (AACU). To effectively meet these demands and to assure continued compliance with these and all Federal and State anti-harassment/anti-discrimination laws and regulations as well as ongoing compliance with day-to-day EEO/AA matters, staff are



recommending the creation of a Non-Union Grade 14, Associate Special Assistant, AACU. The position will report directly to the Special Assistant, AACU and will play a strategic role in compliance matters as well as a critical role investigating and assuring statutory and regulatory compliance. The Associate Special Assistant will act as the Special Assistant in the Special Assistant's absence.

1. Title and grade change to one vacant position in the Affirmative Action Compliance Unit from Program Manager, Monitoring and Compliance, Unit 6, Grade 12, to Project Manager, Monitoring and Compliance, Unit 6, Grade 11 to accurately reflect the duties of this position.
2. To create a new position of Associate Special Assistant, Non-Union, Grade 14 to provide adequate staffing to ensure EEO/AA compliance.

The first amendment requires approval by the Personnel and Compensation Committee. The second amendment requires Board approval after review by the Personnel and Compensation Committee.

#### Administration Division Organizational Changes

1. Title and grade change to one filled position in the MIS Department, Administration Division from Senior Systems Analyst, Unit 6, Grade 10, to System Analyst/Programmer III, Unit 6, Grade 11 to provide consistent titles and duties for staff doing similar work.
2. Title change to one vacant position in the MIS Department, Administration Division from Senior Systems Analyst, Unit 6, Grade 10, to Business Systems Analyst, Unit 6, Grade 10 to accurately reflect job duties.

The two amendments require approval by the Personnel and Compensation Committee.

#### Operations Division Organizational Change

1. To create a new position of Environmental Analyst Unit 9, Grade 23 in the Operations Administration department, Operations Division.

The amendment requires Board approval after review by the Personnel and Compensation Committee.

#### **BUDGET/FISCAL IMPACT:**

The annualized budget impact of this PCR amendment will range in cost of \$128,335 to a cost of \$238,776. The actual cost will depend on the salary rate for the new incumbents. Staff will ensure that the cost increase associated with these PCR amendments will not result in spending over the approved FY19 Wages and Salaries budget.

#### **ATTACHMENTS:**

Old Job Descriptions  
New Job Descriptions

MASSACHUSETTS WATER RESOURCES AUTHORITY  
POSITION CONTROL REGISTER AMENDMENTS  
FISCAL YEAR 2019

PCR AMENDMENTS REQUIRING PERSONNEL & COMPENSATION COMMITTEE APPROVAL - December 19, 2018														
Number	Current PCR #	V/F Type	Current Title	UN	GR	Amended Title	UN	GR	Current/Budget Salary	Estimated New Salary	Estimated Annual \$ Impact		Reason For Amendment	
											Current/Budget Salary	Estimated New Salary		Estimated Annual \$ Impact
P10	8410008	V	Program Manager, Monitoring and Compliance	6	12	Project Manager, Monitoring and Compliance	6	11	\$113,864	\$68,328	\$103,540	-\$45,536	-\$10,324	This job grade is more appropriate for the level of the duties associated with the position.
P11	8610015	V	Senior Systems Analyst	6	10	Business Systems Analyst I	6	10	\$94,076	\$62,083	\$94,076	\$0	\$0	To better align job titles and responsibilities from old job description to new description.
P12	8610054	F	Senior Systems Analyst	6	10	System Analyst/ Programmer III	6	11	\$90,455	\$99,540	\$99,540	\$9,085	\$9,085	To provide consistent titles and duties for staff doing similar work and align the titles with industry standards.
PERSONNEL & COMP COMMITTEE TOTAL = 3											SUBTOTAL:		-\$36,451 - -\$1,239	

PCR AMENDMENTS REQUIRING BOARD APPROVAL - December 19, 2018														
Number	Current PCR #	V/F Type	Current Title	UN	GR	Amended Title	UN	GR	Current/Budget Salary	Estimated New Salary	Estimated Annual \$ Impact		Reason For Amendment	
											Current/Budget Salary	Estimated New Salary		Estimated Annual \$ Impact
B11	N/A	N/A	N/A	N/A	N/A	Associate Special Assistant	NU	14	\$0	\$93,254	\$141,723	\$93,254	\$141,723	To provide adequate staffing to ensure EEO/AA compliance.
B12	N/A	N/A	N/A	N/A	N/A	Environmental Analyst	9	23	\$0	\$71,532	\$98,292	\$71,532	\$98,292	To support work related to environmental and regulatory affairs.
BOARD TOTAL = 2											SUBTOTAL:		\$164,786 - \$240,015	
GRAND TOTAL = 5											TOTAL ESTIMATED COSTS:		\$128,333 - \$238,716	

**MWRA  
POSITION DESCRIPTION**



**POSITION:** Program Manager, Monitoring & Compliance

**PCR#:**

**DIVISION:** Support Services

**DEPARTMENT:** Affirmative Action

**BASIC PURPOSE:**

Develops, implements and manages the Affirmative Action and Compliance Unit's monitoring and compliance program including the specialized recruitment of protected class candidates to ensure equal opportunity and compliance in employment for all MWRA Divisions and Units.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Special Assistant.

**SUPERVISION EXERCISED:**

Provides direct supervision of the Personnel Compliance Monitor and the Workforce Development Coordinator

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Oversees the development and implementation of the MWRA's Monitoring and Compliance Program policies and procedures; monitors Authority-wide compliance to ensure equal employment opportunity for both MWRAQ employees and all applicants.
- Oversees and monitors the effectiveness of the affirmative action program.
- Manages the processing and timely completion of all discrimination and sexual harassment investigations filed within the Affirmative Action & Compliance Unit.
- Supervises the preparation of Authority's Affirmative Action Plan and monitors progress toward achieving affirmative action program(s) and staffing goals set forth by the Plan.
- Directs the development, design and implementation of audit systems to effectively

monitor and measure the Affirmative Action Plan.

- Coordinates development of the annual Affirmative Action Unit's action oriented programs, data collection and staffing analysis of the MWRA workforce.
- Manages the monitoring and evaluations of staffing plans according to the Authority's Affirmative Action goals to ensure compliance.
- Designs and implements systems to monitor Affirmative Action workforce compliance and oversee preparation of internal quarterly and annual divisional reports regarding progress towards affirmative action goals as required by the MWRA.
- Reviews all proposed changes of personnel policies and practices to determine their impact upon the achievement of the goals set forth by the Affirmative Action Plan.
- Develops and implements reporting system to monitor Affirmative Action workforce compliance and oversee preparation of Authority-wide Annual and Quarterly Statistical Reports as required by State and Federal legislative compliance.
- Maintains working relationships and affiliations with external state and federal agencies, professional organizations, community organizations and groups as appropriate.
- Serves as unit liaison with Federal and State agencies with regard to quarterly and annual utilization analysis, including relevant workforce analysis and availability data.
- Meets regularly with Division Directors, Department and Unit Heads to determine and negotiate affirmative action staffing goals with regard to their impact on achieving the Authority-wide goal.
- Oversees the monitoring and tracking of recruitment efforts to ensure compliance of protected class representation and makes recommendations with regard to Protected Class applicant sourcing when necessary.
- Assists Unit management in forecasting and developing the Unit's current expense budget.
- Assists unit management in preparing various reports related to monitoring and tracking the Current Expense Budget including but not limited to APPO, Management Indicators, and Program Descriptions and Goals.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) A four (4) year college program in personnel management, business or related field; and
- (B) Six (6) to eight (8) years of EEO/AA experience, including three (3) years experience preparing Affirmative Action plans; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of the principles and practices of EEO/AA report preparation and computerized systems, statistical report analysis and Affirmative Action Planning.
- (B) Demonstrated analytical, written and oral communication skills.
- (C) Demonstrated skills in the operation of the listed tools and equipment.
- (D) Organizational development experience.
- (E) Excellent analytical, interpersonal, oral and written communication skills.

**SPECIAL REQUIREMENTS:**

None.

**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.

The employee must regularly lift and/or move up to 10 pounds. 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.

**January 2015**

**MWRA  
POSITION DESCRIPTION**



**POSITION:** Project Manager, Monitoring & Compliance

**PCR#:** 8410008

**DIVISION:** Affirmative Action

**DEPARTMENT:** Affirmative Action and Compliance Unit

**BASIC PURPOSE:**

Implements and coordinates the Affirmative Action and Compliance Unit's monitoring and compliance program including the specialized recruitment of protected class candidates to ensure equal opportunity and compliance in employment for all MWRA Divisions and Units.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Special Assistant and functional supervision of the Associate Special Assistant

**SUPERVISION EXERCISED:**

Provides direct supervision of the Workforce Development Coordinator.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Coordinates the development and implementation of the MWRA's Monitoring and Compliance Program policies and procedures; monitors Authority-wide compliance to ensure equal employment opportunity for both MWRA employees and all applicants.
- Monitors the effectiveness of the affirmative action program.
- Assists in preparing Authority's Affirmative Action Plan and monitors progress toward achieving affirmative action program(s) and staffing goals set forth by the Plan.
- Implements audit systems to effectively monitor and measure the Affirmative Action Plan.
- Coordinates development of the annual Affirmative Action Unit's action oriented programs, data collection and staffing analysis of the MWRA workforce.

- Monitors and evaluates staffing plans according to the Authority's Affirmative Action goals to ensure compliance.
- Maintains systems to monitor Affirmative Action workforce compliance and oversee preparation of internal quarterly and annual divisional reports regarding progress towards affirmative action goals as required by the MWRA.
- Reviews all proposed changes of personnel policies and practices to determine their impact upon the achievement of the goals set forth by the Affirmative Action Plan.
- In conjunction with the Special Assistant and Associate Special Assistant, assists in processing and timely completion of all discrimination and sexual harassment investigations based on complaints filed or information provided to the Affirmative Action & Compliance Unit.
- Maintains reporting system to monitor Affirmative Action workforce compliance and oversee preparation of Authority-wide Annual and Quarterly Statistical Reports as required by State and Federal legislative compliance.
- Maintains working relationships and affiliations with external state and federal agencies, professional organizations, community organizations and groups as appropriate.
- Serves as secondary Unit liaison with Federal and State agencies with regard to quarterly and annual utilization analysis, including relevant workforce analysis and availability data.
- Along with the Associate Special Assistant, meets regularly with Division Directors, Department and Unit Heads to determine and negotiate affirmative action staffing goals with regard to their impact on achieving the Authority-wide goal.
- Monitors and tracks recruitment efforts to ensure compliance of protected class representation and makes recommendations with regard to protected class applicant sourcing when necessary.
- Assists Unit management in forecasting and developing the Unit's current expense budget.
- Assists Unit management in preparing various reports related to monitoring and tracking the Current Expense Budget including but not limited to Management Indicators, Program Descriptions and Goals & Initiatives.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) A four (4) year college program in personnel management, business or related field; and
- (B) Five (5) to seven (7) years of EEO/AA experience, including one (1) year experience preparing Affirmative Action plans; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of the principles and practices of EEO/AA report preparation and computerized systems, statistical report analysis and Affirmative Action Planning.
- (B) Demonstrated analytical, written and oral communication skills.
- (C) Demonstrated skills in the operation of the listed tools and equipment.
- (D) Organizational development experience.
- (E) Excellent analytical, interpersonal, oral and written communication skills.

**SPECIAL REQUIREMENTS:**

None.

**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.

The employee must regularly lift and/or move up to 10 pounds. 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.

**December 2018**

**MWRA  
POSITION DESCRIPTION**



**POSITION:** Senior Systems Analyst

**PCR#:**

**DIVISION:** Administration & Finance

**DEPARTMENT:** Management Information System (MIS)

**BASIC PURPOSE:**

Senior level programming, systems project management, application maintenance and support on assigned systems. Directs the MWRA's users in defining business needs for the purpose of developing and maintaining applications used by Water and Sewerage users.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Data Resource Manager.

**SUPERVISION EXERCISED:**

Exercises supervision of assigned vendor resources.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Performs needs analyses with users and translates their needs into information flow diagrams and technical specifications.
- Manages the programming development for new systems as well as modifications to existing systems; directs technical teams in developing, designing, programming, testing and installation of user applications.
- Monitors the implementation of standards for all aspects of system development and acceptance testing; oversees the adherence to system development standards by technical consultants.
- Oversees the development and implementation of assigned application(s) to ensure the satisfaction of user needs. Coordinates implementation with users, MIS and contractors.

- Identifies and defines application development opportunities which leverage the installed systems base and future user requirements.
- In conjunction with appropriate staff, establishes, guidelines, standards and procedures for user and technical systems documentation/training, project activities, tracking of resource usage, application quality and transfer of computerized product to the users.
- Performs feasibility studies, analyzes the impact of requested/proposed changes in system, operations, and personnel.
- Maintains state-of -the art knowledge of system design methodology, design tools, standard languages, 4GL languages and operating requirements.
- Utilizes computer-aided software engineering (CASE) tools in documenting and translating user business needs into technical systems specifications and performing structural and logical analysis.

**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) Four (4) to seven (7) years experience with programming support of Oracle systems, including at least two (2) years in project leader capacity within the business/systems analysis area; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of business and systems analysis techniques within the engineering discipline.
- (B) Proficiency with the following required: ORACLE 7 Universal Server, SQL and PL/SQL, ORACLE Designer 2000, Developer 2000, and Discoverer 2000 products and tools.

- (C) Proficiency with the following preferred: ORACLE 7 SQL\*Net, Open VMS, Digital Alpha OSF or UNIX, MIS-Windows 3.x,95, and NT.
- (D) Knowledge in the following preferred: Information and business process modeling, prototyping and reverse engineering, database administration and security management, data warehousing.
- (E) Demonstrated experience in project management techniques and the ability to establish effective relationships with users.
- (F) Excellent 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 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 2000**

**MWRA  
POSITION DESCRIPTION**

**NEW**

**POSITION:** Business Systems Analyst I

**PCR#:**

**DIVISION:** Administration

**DEPARTMENT:** Management Information System (MIS)

**BASIC PURPOSE:**

The Business Systems Analyst I 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 organization's 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 specifications into language understood by user and management audiences. Communicates and consults with end-users and management to provide information regarding the costs and ramifications of the decisions made.

Evaluates MWRA application and business workflows, identifies improvements, documents requirements, develops prototypes, performs quality assurance, and recommends on how business processes can be improved through better implementation of technology.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Program Manager, MIS managing the Business Systems Analysis function. On specific IT projects may be functionally supervised by higher level employees such as a Business Systems Analyst III or Project Manager.

**SUPERVISION EXERCISED:**

None

## **ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Uses proven business analysis methodologies and requirement gathering techniques to:
  - Collect 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.
- Supports Quality Assurance/Quality Control activities including developing functional and user test acceptance test plans in conjunction with MIS and user stakeholders.
- Researches new approaches to improve business and system processes and develop reports and/or proposals for new or enhanced solutions.
- Identifies and documents gaps between the current “as-is” and recommended “to-be” processes.
- Collaborates with MIS Department engineering staff contractors and vendors to support development of technical specifications for appropriate system infrastructure hardware and software.
- Researches, designs, and tests interfaces between existing and new system applications and platforms to produce seamless integration that complies with business requirements.
- Maintains professional interaction with the MIS staff and user community to ensure adequate system functionality, promote team participation and encourage user confidence in the applications staff quality of service.
- Develops and maintains design documentation, report requirements, and test plans of applications throughout the design process.
- Supports user acceptance testing and release management activities.
- Coordinates 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 MIS community (i.e. project teams) to ensure adequate system functionality,
- Promotes team participation and encourages user confidence in the MIS Department's quality of service.

**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 field; and
- (B) At least three (3) years of information technology experience, preferably 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; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of business and systems analysis techniques within the information technology discipline.
- (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 12 months.

### **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 occasionally works near moving mechanical parts, and is occasionally exposed to risk of vibration.

The noise level in the work environment is moderately quiet at office settings.

December 2018

**MWRA  
POSITION DESCRIPTION**



**POSITION:** Senior Systems Analyst

**PCR#:**

**DIVISION:** Administration & Finance

**DEPARTMENT:** Management Information System (MIS)

**BASIC PURPOSE:**

Senior level programming, systems project management, application maintenance and support on assigned systems. Directs the MWRA's users in defining business needs for the purpose of developing and maintaining applications used by Water and Sewerage users.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Data Resource Manager.

**SUPERVISION EXERCISED:**

Exercises supervision of assigned vendor resources.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Performs needs analyses with users and translates their needs into information flow diagrams and technical specifications.
- Manages the programming development for new systems as well as modifications to existing systems; directs technical teams in developing, designing, programming, testing and installation of user applications.
- Monitors the implementation of standards for all aspects of system development and acceptance testing; oversees the adherence to system development standards by technical consultants.
- Oversees the development and implementation of assigned application(s) to ensure the satisfaction of user needs. Coordinates implementation with users, MIS and contractors.

- Identifies and defines application development opportunities which leverage the installed systems base and future user requirements.
- In conjunction with appropriate staff, establishes, guidelines, standards and procedures for user and technical systems documentation/training, project activities, tracking of resource usage, application quality and transfer of computerized product to the users.
- Performs feasibility studies, analyzes the impact of requested/proposed changes in system, operations, and personnel.
- Maintains state-of -the art knowledge of system design methodology, design tools, standard languages, 4GL languages and operating requirements.
- Utilizes computer-aided software engineering (CASE) tools in documenting and translating user business needs into technical systems specifications and performing structural and logical analysis.

**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) Four (4) to seven (7) years experience with programming support of Oracle systems, including at least two (2) years in project leader capacity within the business/systems analysis area; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of business and systems analysis techniques within the engineering discipline.
- (B) Proficiency with the following required: ORACLE 7 Universal Server, SQL and PL/SQL, ORACLE Designer 2000, Developer 2000, and Discoverer 2000 products and tools.

- (C) Proficiency with the following preferred: ORACLE 7 SQL\*Net, Open VMS, Digital Alpha OSF or UNIX, MIS-Windows 3.x,95, and NT.
- (D) Knowledge in the following preferred: Information and business process modeling, prototyping and reverse engineering, database administration and security management, data warehousing.
- (E) Demonstrated experience in project management techniques and the ability to establish effective relationships with users.
- (F) Excellent 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 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 2000**



**MWRA  
POSITION DESCRIPTION**



**POSITION:** Systems Analyst/Programmer III

**PCR#:**

**DIVISION:** Administration & Finance

**DEPARTMENT:** Management Information System (MIS)

**BASIC PURPOSE:**

This position is responsible for analyzing, designing, developing, testing, implementing and maintaining software applications. This position is also responsible for the post implementation support including incident, performance, capacity, continuity and problem management activities. The Systems Analyst/Programmer III is responsible for the preparation, and maintenance of system documentation to be used by the IT staff and user community.

The Systems Analyst/Programmer III also serves as a team lead for assigned projects, maintains and upgrades project plans and schedules and ensures IT testing is scheduled and documented

**SUPERVISION RECEIVED:**

Works under the general supervision of the group supervisor. On specific IT projects may be supervised by a team lead or project manager.

**SUPERVISION EXERCISED:**

Exercises supervision of assigned vendor resources and IT project team.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

**Application Development**

- Reviews application design prior to buy or build decision to ensure service levels can be met and recommend any performance enhancements prior to implementation
- Codes, configures, implements, maintains and supports, new and upgrades to software applications (in-house and third party software) and interfaces to ensure processes and functionality of the applications comply with the organization's requirements, processes and standards.

- Develops and maintains technical documentation for applications as follows:
  - Design Model - Description of the system design. Comprised of a variety of work products, potentially including a deployment model, an object model, a physical data model (PDM), a security threat model, a system overview document, and a user interface model.
  - Source Code – The program code for the system.
  - Regression Test Suite - Collection of test cases, and the code to run them in the appropriate order. The regression test suite will include a wide range of tests, including acceptance tests, unit tests, system tests, etc.
  - Installation Scripts - Code for installing the system into pre- and post-production environments.
  - Release Notes - Summarize the things to know pertaining to the current release of the system.
  - Operations Procedure - Procedures and supporting information to operate the system once it is in production including continuity and disaster recovery procedures.
  - Support Reference- Used by support staff, such as trouble shooting guides, contact information for the development team, which enables them to support end users
- Responsible for developing a release package for all systems changes when transitioning to the production environments.

### **Post Implementation Support**

- Supports the resolution of incidents and problems with software application functionality.
- Researches and corrects problems with the system applications code during production processing in an efficient and timely manner ensuring system recovery and integrity.
- Is available to execute and carry out IT Continuity and Disaster Recovery Plans
- Is a Technical Member of the Change Advisory Board (CAB) as needed.
- Serves as team lead for assigned projects and updates/maintains project plans and schedules as required.

### **Mentoring & Professionalism**

- Maintains professional interaction with the application development staff, user and extended IT community (i.e. project teams) to ensure adequate system functionality, promote team participation and encourage user confidence in the Application Development Staff's quality of service.
- Provides assistance to Systems Analysts/Programmer I and II personnel ensuring that all technical design work, coding and testing are done in a manner that meets or exceeds design and testing requirements and standards.

## **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 supporting enterprise wide applications as well as tier two applications.
- (C) Any equivalent combination of education or experience.

### **Necessary Knowledge, Skills and Abilities:**

- (A) Extensive knowledge of programming languages, troubleshooting techniques, database structures, triggers and procedures, application server platforms, middleware and operating systems.
- (B) Knowledge of the following is desirable: MS .Net, J2EE, Crystal Reporting, ORACLE 11g, SQL Server and PL/SQL.
- (C) Analytical and interpersonal skills
- (D) Written and oral communication skills.

## **SPECIAL REQUIREMENTS:**

- Information Technology Infrastructure Library (ITIL) Foundation Certification is required or the ability to obtain within one year.
- Formal training or certification in programming methodologies and System Development Life Cycle methodologies is required or the ability to obtain within one year.
- Microsoft Certified Solutions Developer (MCSD) or equivalent is required or the ability to obtain within one year of scheduled training.

## **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 2018**

**MWRA  
POSITION DESCRIPTION**



**POSITION:** Associate Special Assistant

**PCR#:**

**DIVISION:** Affirmative Action

**DEPARTMENT:** Affirmative Action and Compliance Unit

**BASIC PURPOSE:**

Assists with the planning and implementing department goals and objectives and acts in the absence of the Special Assistant. Directs all activities of an administrative nature.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Special Assistant.

**SUPERVISION EXERCISED:**

Functionally supervises the Project Manager, Monitoring and Compliance, the MBE/WBE Program Manager, the Personnel Compliance Monitor and administrative staff.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Assists the Special Assistant in coordinating the activities of the Unit. Works with program managers and staff to ensure effective communication and work flows identifies problems and issues and creates action plans to address same.
- Oversees day-to-day Unit operations, represents the Special Assistant on administrative matters, and signs-off on documents.
- Supervises the investigation of internal discrimination charges and complaints filed by employees and/or applicants for employment with the Authority.
- In conjunction with the Manager, Training and Development, coordinates of the design and presentation of workshops and training sessions regarding Federal and State Equal Employment Opportunity (EEO/AA) laws.
- Reviews and makes recommendations to ensure that personnel practices are in compliance with Federal and State EEO/AA laws and regulations including the



Massachusetts Equal Pay Act (MEPA).

- Supervises the development and monitors the implementation of the Authority's Affirmative Action Plan (AAP) including the achievement of staffing and M/W/DBE goals by each division.
- Directs the development of the department's budget and monitors for adherence to Authority's policies and variance reporting.
- Maintains strong working relationships and affiliations with external state and federal agencies, professional organizations, community organizations and groups as appropriate.
- Serves as the primary Unit liaison with Federal and State agencies with regard to quarterly and annual utilization analysis, including relevant workforce analysis and availability data.
- Maintains working knowledge of Authority EEO/AA policies and all current state, local and federal EEO/AA matters relating to collective bargaining agreements, labor relations and bargaining unit grievance hearings.
- Serves on selection committees.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) A four (4) year college program in public administration, management, business administration, or related field. Graduate degree preferred; and
- (B) Knowledge of State and Federal employment laws and EEO/AA principles and practices as acquired by seven (7) to nine (9) years of experience in human resource administration, dispute resolution, or affirmative action of which at least three (3) years are in a managerial or supervisory capacity. Public sector experience strongly preferred; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Excellent analytical and writing skills.

- (B) Working knowledge and understanding of relevant contract compliance and M/W/DBE program development.
- (C) Excellent writing and oral communication skills.
- (D) Ability to plan, organize, direct, train and assign duties to subordinates.
- (E) Ability to maintain confidentiality.

**SPECIAL REQUIREMENTS:**

A valid Massachusetts Class D Motor Vehicle Operator'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. The employee must occasionally lift and/or move up to 10 pounds.

Specific vision abilities required by this job include close vision and the ability to 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 employee occasionally works in outside weather conditions.

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

**December 2018**

**MWRA  
POSITION DESCRIPTION**



**POSITION:** Environmental Analyst

**DIVISION:** Operations

**DEPARTMENT:** Environmental and Regulatory Affairs

**BASIC PURPOSE:**

Supports the Director of Environmental and Regulatory Affairs in evaluating local, state, and federal environmental regulations and permit requirements related to MWRA operations. This job also includes assisting in the oversight and implementation of operating procedures for water and wastewater expansion.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Director of Environmental and Regulatory Affairs.

**SUPERVISION EXERCISED:**

May oversee contracts or supervise one or more interns as needed.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Assists with environmental permitting and operational decisions based on research of local, state and federal requirements. Specifically, the Massachusetts Environmental Policy Act, the Wetlands Protection Act, federal and state Clean Waters Act, federal and state Clean Air Act requirements, and storm water permit requirements.
- Prepares updates to MWRA operational materials to ensure work is conducted in a manner that is consistent with the Massachusetts Endangered Species Act and Natural Heritage & Endangered Species Program guidelines.
- Researches and summarizes information on whether MWRA project (construction) activities trigger MEPA thresholds and guides project managers and consultants on the required permitting associated with those thresholds.

- Review and oversee notices of intent prepared for local conservation commissions for MWRA projects.
- Assists senior managers in providing reporting recommendations under the Massachusetts Contingency Plan requirements.
- Assist in management of water and wastewater expansion efforts.
- Prepares reports, technical presentations, answers to inquiries, and letters for the Department Director.
- Tracks permits for MWRA projects, including reporting requirements, due dates, and responsible parties. Keeps MWRA staff abreast of impending deadlines.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) A four (4) year college degree in environmental science, political science, public policy or administration, environmental engineering or equivalent degree in environmental science or related field. A master's degree preferred; and
- (B) Three (3) to five (5) years of experience in interpreting or applying environmental regulations; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of water and wastewater treatment systems, watershed management, and environmental regulations.
- (B) Excellent computer skills in Oracle, Access and Excel and working knowledge of MS Word and Power Point.
- (C) Demonstrated abilities to work as part of a team, to develop and maintain productive

working relationships with external parties, and to function independently with minimal supervision.

- (C) Excellent written and communication skills as well as good interpersonal and organizational skills.

**SPECIAL REQUIREMENTS:**

None.

**TOOLS AND EQUIPMENT USED:**

Office equipment 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 use hands to finger, handle, feel or operate objects including office equipment or controls and reach with hands and arms. The employee is frequently required to sit, talk and hear. The employee is occasionally required to stand and walk, stoop, kneel, crouch or crawl, taste or smell.

There are no requirements that weight be lifted or force be exerted in performance of this job, although the employee may have the opportunity to participate in field activities that involve lifting weight (e.g. water, sediment or other environmental samples) or exerting force. Specific vision requirements required by this job include close vision, distance vision, depth perception, 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 a moderately quiet office setting.

July 2018

- Make themselves available for work during any emergency.
- Provides training to assigned staff.
- Operates motor vehicles, such as vans and pick-up trucks, to transport materials to work sites, pick up equipment, etc.
- Performs related duties as assigned.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) Knowledge of the principles and practices of maintenance attained through a four (4) year college program in civil, mechanical, electrical/electronic or environmental engineering or related field; and
- (B) Demonstrated practical understanding of all phases of operations, maintenance engineering, and management of water or wastewater flow metering systems, as normally acquired through seven (7) to nine (9) years of related experience. Knowledge of water distribution and/or wastewater collection systems preferred; and
- (C) Three (3) years of experience in supervising staff and/or large projects; or
- (D) Any equivalent combination of education and experience.

Necessary Knowledge, Skills and Abilities:

- (A) Demonstrated knowledge of water or wastewater meter technologies and Telog software and components.
- (B) Proven ability to plan, organize, direct, train, assign duties to, and maintain harmonious working relationships with maintenance staff and other personnel. Demonstrated successful experience managing in a union environment with a diverse workforce.
- (C) Proficiency with personal computers and knowledge of word processing, spreadsheets, database and engineering application software.
- (D) Extensive experience utilizing computerized maintenance management and work order systems.
- (E) Excellent oral and written communication skills.

## **SPECIAL REQUIREMENTS:**

A valid Massachusetts Class D Motor Vehicle Operators License.

A valid Massachusetts Grade 4 wastewater operator's license or 2D Drinking Water Supply Facilities Operators license preferred.

Must be available to respond to emergencies as needed.

## **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.

While performing the duties of this job, the employee occasionally works in outside weather conditions. The employee works near moving mechanical parts is occasionally exposed to wet and/or humid conditions. The employee is occasionally exposed to fumes and airborne particles, toxic or caustic chemicals, and risk of electric shock.

The noise level in the office environment is usually moderately quiet and is moderately loud in field settings.

**December 2018**

**MWRA  
POSITION DESCRIPTION**



**POSITION:** Associate Special Assistant

**PCR#:**

**DIVISION:** Affirmative Action

**DEPARTMENT:** Affirmative Action and Compliance Unit

**BASIC PURPOSE:**

Assists with the planning and implementing department goals and objectives and acts in the absence of the Special Assistant. Directs all activities of an administrative nature.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Special Assistant.

**SUPERVISION EXERCISED:**

Functionally supervises the Project Manager, Monitoring and Compliance, the MBE/WBE Program Manager, the Personnel Compliance Monitor and administrative staff.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Assists the Special Assistant in coordinating the activities of the Unit. Works with program managers and staff to ensure effective communication and work flows identifies problems and issues and creates action plans to address same.
- Oversees day-to-day Unit operations, represents the Special Assistant on administrative matters, and signs-off on documents.
- Supervises the investigation of internal discrimination charges and complaints filed by employees and/or applicants for employment with the Authority.
- In conjunction with the Manager, Training and Development, coordinates of the design and presentation of workshops and training sessions regarding Federal and State Equal Employment Opportunity (EEO/AA) laws.
- Reviews and makes recommendations to ensure that personnel practices are in compliance with Federal and State EEO/AA laws and regulations including the

Massachusetts Equal Pay Act (MEPA).

- Supervises the development and monitors the implementation of the Authority's Affirmative Action Plan (AAP) including the achievement of staffing and M/W/DBE goals by each division.
- Directs the development of the department's budget and monitors for adherence to Authority's policies and variance reporting.
- Maintains strong working relationships and affiliations with external state and federal agencies, professional organizations, community organizations and groups as appropriate.
- Serves as the primary Unit liaison with Federal and State agencies with regard to quarterly and annual utilization analysis, including relevant workforce analysis and availability data.
- Maintains working knowledge of Authority EEO/AA policies and all current state, local and federal EEO/AA matters relating to collective bargaining agreements, labor relations and bargaining unit grievance hearings.
- Serves on selection committees.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) A four (4) year college program in public administration, management, business administration, or related field. Graduate degree preferred; and
- (B) Knowledge of State and Federal employment laws and EEO/AA principles and practices as acquired by seven (7) to nine (9) years of experience in human resource administration, dispute resolution, or affirmative action of which at least three (3) years are in a managerial or supervisory capacity. Public sector experience strongly preferred; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Excellent analytical and writing skills.



- (B) Working knowledge and understanding of relevant contract compliance and M/W/DBE program development.
- (C) Excellent writing and oral communication skills.
- (D) Ability to plan, organize, direct, train and assign duties to subordinates.
- (E) Ability to maintain confidentiality.

**SPECIAL REQUIREMENTS:**

A valid Massachusetts Class D Motor Vehicle Operator'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. The employee must occasionally lift and/or move up to 10 pounds.

Specific vision abilities required by this job include close vision and the ability to 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 employee occasionally works in outside weather conditions.

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

**December 2018**

**MWRA  
POSITION DESCRIPTION**



**POSITION:** Environmental Analyst  
**DIVISION:** Operations  
**DEPARTMENT:** Environmental and Regulatory Affairs

**BASIC PURPOSE:**

Supports the Director of Environmental and Regulatory Affairs in evaluating local, state, and federal environmental regulations and permit requirements related to MWRA operations. This job also includes assisting in the oversight and implementation of operating procedures for water and wastewater expansion.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Director of Environmental and Regulatory Affairs.

**SUPERVISION EXERCISED:**

May oversee contracts or supervise one or more interns as needed.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Assists with environmental permitting and operational decisions based on research of local, state and federal requirements. Specifically, the Massachusetts Environmental Policy Act, the Wetlands Protection Act, federal and state Clean Waters Act, federal and state Clean Air Act requirements, and storm water permit requirements.
- Prepares updates to MWRA operational materials to ensure work is conducted in a manner that is consistent with the Massachusetts Endangered Species Act and Natural Heritage & Endangered Species Program guidelines.
- Researches and summarizes information on whether MWRA project (construction) activities trigger MEPA thresholds and guides project managers and consultants on the required permitting associated with those thresholds.

- Review and oversee notices of intent prepared for local conservation commissions for MWRA projects.
- Assists senior managers in providing reporting recommendations under the Massachusetts Contingency Plan requirements.
- Assist in management of water and wastewater expansion efforts.
- Prepares reports, technical presentations, answers to inquiries, and letters for the Department Director.
- Tracks permits for MWRA projects, including reporting requirements, due dates, and responsible parties. Keeps MWRA staff abreast of impending deadlines.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) A four (4) year college degree in environmental science, political science, public policy or administration, environmental engineering or equivalent degree in environmental science or related field. A master's degree preferred; and
- (B) Three (3) to five (5) years of experience in interpreting or applying environmental regulations; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of water and wastewater treatment systems, watershed management, and environmental regulations.
- (B) Excellent computer skills in Oracle, Access and Excel and working knowledge of MS Word and Power Point.
- (C) Demonstrated abilities to work as part of a team, to develop and maintain productive

working relationships with external parties, and to function independently with minimal supervision.

- (C) Excellent written and communication skills as well as good interpersonal and organizational skills.

**SPECIAL REQUIREMENTS:**

None.

**TOOLS AND EQUIPMENT USED:**

Office equipment 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 use hands to finger, handle, feel or operate objects including office equipment or controls and reach with hands and arms. The employee is frequently required to sit, talk and hear. The employee is occasionally required to stand and walk, stoop, kneel, crouch or crawl, taste or smell.

There are no requirements that weight be lifted or force be exerted in performance of this job, although the employee may have the opportunity to participate in field activities that involve lifting weight (e.g. water, sediment or other environmental samples) or exerting force. Specific vision requirements required by this job include close vision, distance vision, depth perception, 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 a moderately quiet office setting.

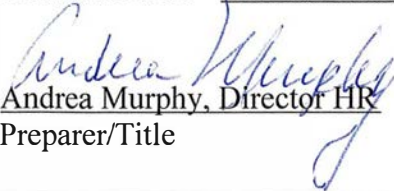
July 2018


### STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Appointment of Budget Director, Finance Division

---

COMMITTEE: Personnel and Compensation

  
Andrea Murphy, Director HR  
Preparer/Title

  X   VOTE  
INFORMATION  
  
Thomas J. Durkin  
Director of Finance

---

#### RECOMMENDATION:

To approve the appointment of Mr. James F. Halloran to the position of Budget Director, Finance Division (Non-Union, Grade 16) at an annual salary of \$135,000 commencing on a date to be determined by the Executive Director.

#### DISCUSSION:

The Budget Director directs and oversees the Authority's annual and multi-year programs and budgets. The Budget Director coordinates development of the long-term Capital Improvement Program (CIP) and monitors the progress of capital projects compared to planned schedules and budgets. The Budget Director is also responsible for coordinating development of the Authority's annual Current Expense Budget (CEB) and monitoring spending over the year as compared to approved budget. The Budget Director supervises the development of the annual community assessments and the budget forecasting model. The position reports to the Director of Finance. This position became vacant with the retirement of the incumbent.

#### Selection Process

This position was posted internally and externally. Twenty three external candidates applied. Five candidates were interviewed by the Director of Finance, Treasurer, and Special Assistant for Affirmative Action. Two candidates were interviewed a second time by the Executive Director. James F. Halloran was selected as the most qualified candidate based on his combination of experience, abilities, knowledge and education.

Mr. Halloran currently serves as the Director of Administration and Finance for the City of Somerville's Department of Public Works. In that capacity, Mr. Halloran is responsible for the development of the Departments' annual Capital Budget, Departmental Budget, Grant and Revolving Fund Budgets. Prior to that, Ms. Halloran worked for the University of Massachusetts, Boston where he was the Assistant Director of Financial Management. In this role, Mr. Halloran managed the financial reporting and budget process for all research and



graduate college divisions. In addition, Mr. Halloran has volunteered his time on the Burlington Zoning Board of Appeals and currently serves on the Medford Zoning Board of Appeals.

Mr. Halloran holds degrees of Bachelor of Arts in Economics/Legal Studies from University of Massachusetts Lowell and a Master of Business Administration from the University of Massachusetts Lowell.

**BUDGET/FISCAL IMPACT:**

There are sufficient funds in the FY19 CEB for this position.

**ATTACHMENTS:**

James F. Halloran resume  
Position Description  
Rates and Budgets Department Organization Chart

## **JAMES F. HALLORAN**

### **Professional Experience**

2016- Present **CITY OF SOMERVILLE DEPARTMENT OF PUBLIC WORKS**  
**Director of Administration and Finance**

- Develops and maintains the annual Capital Budget, Departmental Budget, Grant, and Revolving Fund Budgets.
- Provides financial analysis of ongoing projects including the multi-year capital plan implementation.
- Manages systems for financial planning and management for all expenditures including buildings, grounds, fleet services, and equipment.
- Manages the centralized service section (311 and QAlert) responsible for providing centralized reception, work request and complaint services.
- Manages the financial services staff members, customer service staff members as well as the payroll manager.
- Oversees Public Works and Construction contracts, including written documentation of contractor performance, and provides vendor management to the department.
- Manages external reporting to MassDOT, Department of Revenue, and other state and federal agencies.
- Manages the financial reimbursements of the Chapter 90 roadway reconstruction program and any associated payments and accounting.
- Works with Purchasing on contract development - examples include MBTA, Capital Equipment Vendors, and Public Works service vendors.

2016- 2016 **MUSA TECHNOLOGY PARTNERS – Waltham, MA**  
**Business/Finance Manager**

- Responsible for the Financial Management of the company, including managing the annual budget process, business financing options, cash flow analysis and management, lease vs. buy analysis, and credit line management.
- Managed Procurement and contracts for the company, including equipment vendors and office space procurement.
- Prepared legal contracts, agreements, Non-Disclosure agreements and trademarks.
- Implemented cost saving measures by streamlining financial, HR, and Purchasing functions and procedures.
- Documented and created business processes for financial reporting, procurement, and financial operations.

2011-2016 **UNIVERSITY OF MASSACHUSETTS – Boston, MA**  
**Assistant Director of Financial Management (2013-2016)**

- Managed the financial reporting and budget process for all research and graduate college divisions.

- Helped bring the Research Enterprise into a positive financial spot after years of mismanagement.
- Managed the Human Resource functions for over 700 employees, including compensation and benefits, payroll, labor relations, and training and development.
- Prepared and presented financial analysis, reports, and presentations to executive leadership to enhance decision-making processes using Tableau, query, Excel, and Access, SAP.
- Managed analysts in the production of financial reports and forecasting.
- Provided leadership and project management expertise on a wide range of financial initiatives and complex financial analysis, such as financial benchmarking, outcomes assessment, and new program costing and pricing.

#### **Financial Reporting Analyst (2011-2013)**

- Finance Business Partner to a number of campus areas including, Facilities, Administration, Public Safety, Information Technology, and Campus Services (including Marine Operations, Fleet, Dining, and Housing).
- Developed multi-year revenue and expense forecasts.
- Conducted strategic and quantitative analysis on revenue and expense performance, and prepared presentations and briefing material by consolidating and integrating data from a variety of sources.
- Planned, facilitated, and executed projects and initiatives with cross-functional groups and served as a key contributor in teams and work groups across the organization, providing financial and administrative policy expertise.
- Developed and produced regular reports on the financial performance of the organization, including analysis of the key drivers of those results.

#### 2007-2011 **MASS DEPARTMENT OF HEALTH AND HUMAN SERVICES – Boston, MA Budget and Planning Analyst (2008-2011)**

- Managed leases and the space procurement process for over 20 individual area offices within Massachusetts. Duties included space planning, lease review/negotiation, and financial analysis of potential sites and build-outs.
- Monitored the annual operating budget and one-time investments.
- Determined the financial consequences of changes in policy, programs, or activities affecting the organization's finances and functional area resources.
- Reported on all aspects of spending including: encumbrance management, appropriation status, spending actual versus budgeted, produced year-end reports, and ad hoc queries as needed.

#### **Personnel Officer (2007-2008)**

- Responsible for making sure all State and Federal laws were adhered to when processing HR transactions.
- Prepared HRIS reports for both management and required reports for payroll processing by running queries and Business Intelligence Tools including PeopleSoft and Access.

#### 2008- Present **THE NORTON GROUP – Somerville, MA Real Estate Consultant**

- Real Estate License through the Commonwealth of Massachusetts.
- Experience representing both buyers and sellers in sales transactions.
- Experience with Conventional financing, FHA financing, Mass Housing, commercial sales, multi-family sales, apartment rentals, and single family sales.

## **Education**

- 2015 University of Massachusetts Boston, MBA
- 2007 University of Massachusetts Lowell, Economics/Legal Studies
- 2018 Massachusetts Certified Public Procurement Officer

## **Achievements, Activities & Interests**

- Medford Massachusetts Zoning Board of Appeals - 2017-present
- Burlington Massachusetts Zoning Board of Appeals - Vice Chairman, 2012-2016: Hears and decides petitions for variances, makes determinations in Flood Hazard Districts, and issues comprehensive permits under MGL Chapter 40B.
- Burlington Town Meeting Member – 2012

**MWRA  
POSITION DESCRIPTION**

**POSITION:** Budget Director

**PCR#:** 4410001

**DIVISION:** Finance

**DEPARTMENT:** Budget

**BASIC PURPOSE:**

Directs, plans and monitors the Authority's multi-year capital and operating budgets, and oversees program performance planning and implementation. Supports revenue management, rates management, and setting and revenue planning programs.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Director of Finance.

**SUPERVISION EXERCISED:**

Exercises close supervision of department managers and staff employees.

- Budget Manager (1)
- Assistant Manager, Rates & Revenue (1)
- Financial IS Project Leader (1)
- Financial Analyst (1)
- Assistant Finance Manager (2)
- Senior Financial Analyst (2)

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Primary responsibility for the planning, development, delivery and presentation of MWRA's Capital Improvement Program and Current Expense Budgets.
- Directs annual and multi-year planning of Authority resource requirements and resource allocations. Responsible for developing, implementing and evaluating expenditure control methods and procedures and program performance objectives and standards. Directs the formulation and consolidation of plans into budgets, oversees the evaluation and reporting of plan implementation and recommends changes in resource allocation or program implementation.

- Measures, monitors and reports MWRA expenditure activity throughout the fiscal year, including the identification and oversight management of financial trends and significant variances occurring within or across budgetary periods. Reviews budgets, rates and expenditure performances.
- Oversees development of financial projections necessary to ensure consistent financial policies, coordinates short and long term financial planning and develops methods for economic forecasting.
- Develops and recommends the formulation and refinement of financial systems, policies and procedures.
- Supports strategic planning and management of water and sewer rate setting.
- Reviews, comments upon and evaluates budgetary impact of all fiscal recommendations made to the Director of Finance, Executive Director and the Board of Directors.
- Represents the Authority to external constituents.
- Other duties and tasks as requested.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) Knowledge of budgeting principles and procedures as normally attained through a four (4) year college program in business administration, public management, accounting, finance or a related field. An advanced degree strongly preferred; and
- (B) Understanding of fiscal management as acquired by ten (10) to twelve (12) years progressively responsible experience, including five (5) to seven (7) years experience in budget preparation and management in a private, public or governmental agency, of which five (5) years should be in a supervisory or managerial capacity; or
- (C) Any equivalent combination of education and experience.



Necessary Knowledge, Skills, and Abilities:

- (A) Excellent interpersonal, oral and written communications skills are required.
- (B) Knowledge of and experience with Oracle Financial Analyzer or Hyperion or other database application strongly preferred.
- (C) Extensive knowledge of and experience with PC spreadsheet programs, word processing programs, model function and design, graphics applications, database development and queries, use of the Internet as a resource/research tool, and interface with other computer applications strongly preferred.

**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 machine, and fax machine.

**PHYSICAL DEMANDS:**

The physical demands described 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 and talk or hear. The employee is frequently required to use hands to finger, handle, or operate objects, including office equipment and controls, and reach with hands and arms. The employee is occasionally required to stand and walk.

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:**

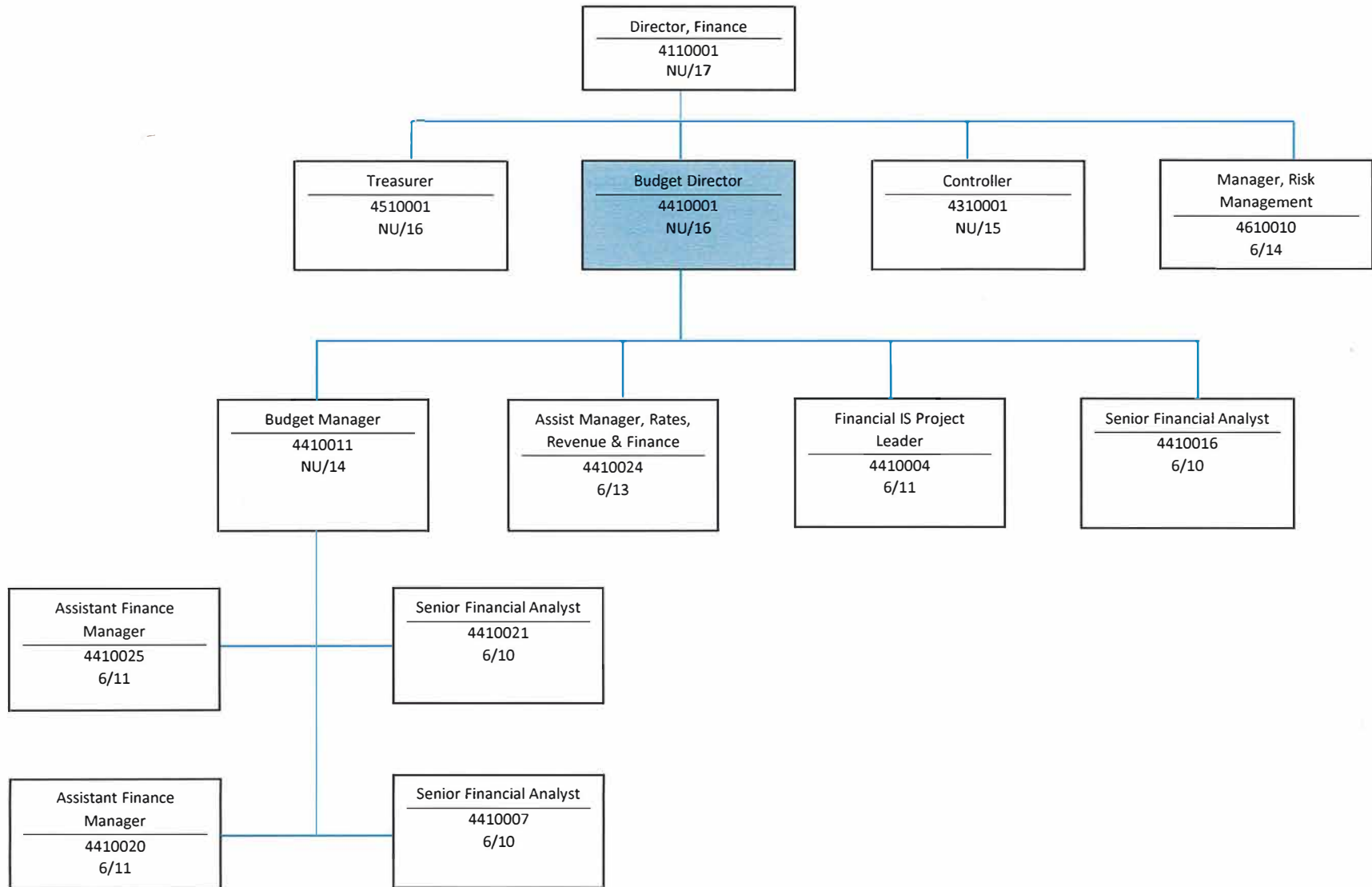
The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job.

While performing the duties of this job the employee regularly works in an office environment. The noise level in the work environment is a moderately quiet office setting.

October 2018

Page 3 of 3

Finance Division  
Rates and Budget Department  
December 2018



## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director  
**DATE:** December 19, 2018  
**SUBJECT:** Appointment of Chief Engineer




---

**COMMITTEE:** Personnel & Compensation

INFORMATION  
 VOTE

Andrea Murphy, Director, Human Resources  
Preparer/Title



---

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

---

### RECOMMENDATION:

To approve the appointment of Mr. John P. Colbert to the position of Chief Engineer (Non-Union, Grade 16), at the recommended annual salary of \$161,350, to be effective on a date to be determined by the Executive Director.

### DISCUSSION:

The position of Chief Engineer became vacant in July 2018 as a result of the retirement of the incumbent. The Chief Engineer reports directly to the Chief Operating Officer and manages 54 in-house engineering staff and 28 construction management staff, and directs numerous consultant contracts. This position oversees all water and wastewater (non-Deer Island) engineering design and construction projects. The Chief Engineer directs the engineering, construction and start-up of water supply and wastewater facilities, ensures adequate allocation of staff and financial resources for successful implementation of capital and maintenance project delivery, and manages the engineering and construction transition from capital delivery to operations start-up and maintenance. The Chief Engineer also oversees the department's capital improvement budget, and manages the evaluation of alternatives and solutions to complex engineering problems and the development of environmentally sound solutions.

The Chief Operating Officer interviewed the current Acting Chief Engineer, Mr. John Colbert, and recommended his appointment to the position of Chief Engineer. John Colbert has been Acting Chief Engineer since July 2018. Mr. Colbert has more than 35 years of professional experience working in the field of engineering. Prior to joining MWRA in 1998, Mr. Colbert performed design and construction work on various heavy utility and power plant projects. He began his career at MWRA as a Senior Staff Engineer, Mechanical, and has progressed steadily since that time. He has been promoted to positions of increasing responsibilities, including Deer Island Facility Engineer, MWRA Asset Manager, Manager of Maintenance for Metropolitan East, Water and Sewer, Deputy Director of Deer Island and Deputy Chief Engineer.

At the MWRA, Mr. Colbert has an outstanding history of successfully managing large and complex projects on time and on budget, and developing and implementing countless improvements to increase efficiencies and productivity. As a result of his various roles at MWRA, he has good insight into the operations and maintenance requirements for engineering and construction projects. This institutional knowledge and his last three years as Deputy Chief Engineer make him exceptionally qualified to take on the role of Chief Engineer.

Mr. Colbert possesses a Bachelor of Science degree in Mechanical Engineering from Tufts University and a Master of Science degree in Applied Mechanics from Northeastern University. He is a Registered Professional Engineer, holds a Grade 7 Wastewater Operators license, and is a Certified Maintenance Reliability Professional.

**BUDGET/FISCAL IMPACT:**

There are sufficient funds in the FY19 CEB for this position.

**ATTACHMENTS:**

Resume of John P. Colbert  
Position Description  
Organization Chart

## **JOHN P. COLBERT**

---

---

### SUMMARY OF QUALIFICATIONS

- Proven engineering and maintenance manager that has implemented improvements to increase efficiencies and equipment availability.
- Proven proficiency in accomplishing complex projects from initial conception through construction, startup, and operation.
- Wide experience in working with diverse discipline groups and all levels of management.
- Strong leadership and organization skills.
- Strong technical background.

### ACCOMPLISHMENTS

- Over 36 years proven engineering, maintenance, and operations experience.
  - Engineering and maintenance of water and wastewater public utility.
  - Engineer during construction, startup and operation of a large nuclear power facility
  - Successfully provided project management and technical supervision for design changes.
  - Integral member of the startup team of a commercial nuclear power plant.
- 
- 

### PROFESSIONAL EXPERIENCE

#### **June 1998 - present - Massachusetts Water Resources Authority**

Acting Chief Engineer, July 2018 to present

- Supervisor of 82 Engineering and Construction staff
- Responsible for managing engineering design and construction for water and wastewater facilities and pipelines
- Responsible for development of Capital Improvement Program

Deputy Chief Engineer, December 2014 to July 2018

- Supervisor of 50 engineering staff.
- Responsible for the design and engineering of water and wastewater engineering projects including facility rehabilitation and pipeline replacements.

Deer Island Deputy Director, March 2014 to December 2014

- Supervisor of 39 Operations staff and 17 Process Control staff.
- Supervisor of 13 On Site Thermal Plant Operations staff
- Previously supervisor of 132 Maintenance and Planning and Scheduling staff
- Responsible for the wastewater operation, process control, and thermal power plant operation of the Deer Island Treatment Plant.

Manager, Maintenance Metro East, July 2008 to March 2014

- Supervisor of 115 trade staff including planners, electricians, mechanics, HVAC technicians, painters, carpenters, masons, building and grounds, and metering instrument technicians.

## **JOHN P. COLBERT**

- Responsible for the maintenance of all water and wastewater facilities including headworks, pumping stations and combined sewer overflow facilities in eastern Massachusetts.
- Responsible for a maintenance budget of approximately \$8 million dollars.

MWRA Asset Manager, February 2001 to July 2008

- Supervisor of the Work Coordination Group and Condition Monitoring Group of 12 staff.
- Implemented a maintenance asset management program at Deer Island including the expansion of the Condition Monitoring program, Reliability Centered Maintenance analysis for 70 plant systems, Preventive Maintenance optimization, maintenance staff training program, and development of Maintenance metrics.

Deer Island Plant Engineer, July 1999 to February 2001

- Supervisor of Plant Engineering and Construction Coordination and Warranty Group consisting of 8 engineers.
- Oversee as-needed design engineering tasks for \$750,000/year contracts
- Working supervisor responsible for Combustion Turbine Generator recall modifications, sodium hypochlorite tank relining, expansion joint upgrades, and site wide coating project

Senior Staff Engineer, Mechanical, June 1998 to July 1999

- Provided engineering support to the operations and maintenance departments.
- Responsible for resolving engineering design issues at the Deer Island Treatment Plant. Projects included resolution shaft failures of high pressure process water pumps, oil conversion of power plant oil boilers, primary and secondary clarifier expansion joint engineering services contract, piping material investigation for influent clarifier channels, resolution of cycling and cavitation of raw water pumps.

---

---

## **August 1982 to June 1998 - Lead Mechanical Engineer - Stone & Webster Engineering Corporation, Boston, MA**

Minnesota Agri-Power Project, January 1988 to June 1988

- Responsible for the preparation of purchase specifications and preliminary design of several systems (P&ID and system description preparation) for a 75 MW cogeneration plant using the gas produced from alfalfa stems in a gasifier for fuel.

Northeast Utilities Design Engineering Group, March 1992 to January 1998, June 1989-October 1989, March 1983 to June 1987

- Supervisor of Mechanical Modifications Group of 8-20 engineers and designers
- Responsible for supervision, coordination, planning and scheduling of engineering groups in project activities.
- Prepared evaluations, reports, and presentations for senior management on engineering projects.
- Project Engineer for the following large construction projects:
  - Fifth Point Feedwater Heater Tube Bundle Replacement (\$1.1 million)
  - Installation of Feedwater Ultrasonics for Steam Flow Calorimetric (\$1.1 million)
  - Service Water Erosion/Corrosion Piping Replacement (\$ 3.8 million)



## **JOHN P. COLBERT**

- Nitrogen Blanketing of Condensate Storage Tank (\$ 1.0 million)

- Preparation of design changes to resolve startup problems.
- Calculations to determine system operating temperatures and pressures as input to stress analysis and to verify system performance.

Computer Department - Engineering Systems, March 1991 to March 1992

- Prepared functional specifications for engineering applications using both an integrated database and CATIA.
- Responsible for initial testing and problem resolution of flow diagram data extraction and report generation program for the Healy Clean Coal Project.

Department of Energy, High Temperature Gas Cooled Reactor (October 1990 to Mar 1992)

- Prepared trade study for condenser alternatives and main steam desuperheater selection.
- Prepared conceptual design of secondary systems including flow diagrams, system descriptions, and equipment sizing calculations.

Yankee Atomic Electric Company, Yankee Rowe Power Plant, June 1989 - December 1989

- Developed component database for use with a computer expert system to evaluate component degradation due to aging.

Tennessee Valley Authority, Watts Bar Nuclear Plants, June 1987 to June 1989

- Developed and implemented a corrective action program for mechanical calculations. Calculations included determination of plant operating temperatures and pressures, component sizing, fluid transient identification, and system flow balance.

Process Engineering Group, August 1982 to March 1983

- Prepared surveys, specification reviews and research for flue gas desulfurization equipment and projects.

## EDUCATION

1982: Tufts University, Bachelor of Science Mechanical Engineering, Cum Laude

1990: Northeastern University, Master of Science Applied Mechanics, 3.5 GPA.

1993: Closed Feedwater Heaters Short Course

1998: Thermoflow Combined Cycle and Cogeneration Gas Turbine Course

## LICENSES AND REGISTRATIONS

2016: Professional Engineer – Massachusetts #52594

2015: Grade 7 Combined Wastewater Operating License

1982: Member American Society of Mechanical Engineers

1988: Professional Engineer - Rhode Island #5146

1999: Grade 6 Combined Wastewater Operating License

2003: Member Society of Maintenance and Reliability Professionals

2008: Certified Maintenance Reliability Professional

## PAPERS/RESEARCH

1995: "Plant Perspective of Steam Flow Calorimetric Implementation,"

J. Colbert and A. Elms, EPRI Secondary Plant Performance Seminar

**JOHN P. COLBERT**

2002: "Outside Resources Contribute to Culture Change," J. Colbert, J. Fortin, T. Regan, Maintenance Technology Magazine.

2006: AWWA Research Foundation, "Applicability of Reliability Centered Maintenance in the Water Industry", Key Individual Contributor

2009: Consultation with the EPA on Aging Water Infrastructure Research Plan

**MWRA  
POSITION DESCRIPTION**

**POSITION:** Chief Engineer  
**PCR#:** 55250113  
**DIVISION:** Operations  
**DEPARTMENT:** Engineering & Construction

**BASIC PURPOSE:**

Directs the engineering and construction functions of the Authority.

**SUPERVISION RECEIVED:**

Reports directly to and acts under the supervision of the Chief Operating Officer.

**SUPERVISION EXERCISED:**

Exercises direct supervision of the Engineering and Construction functions through the Director, Construction; Assistant Director, Engineering (Wastewater); and Assistant Director, Engineering (Water).

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Acts as Authority's Chief Engineer.
- Works with the Chief Operating Officer to oversee the engineering, construction and start-up of water supply and wastewater facilities, ensure adequate allocation of staff and financial resources for successful implementation of capital and maintenance project delivery and manage the engineering and construction transition from capital delivery to operations start-up and maintenance.
- Supervises the project support functions (budget/schedule management, environmental compliance, safety, grants management support and progress reporting) for the Operations Division's capital project delivery Program.
- Responsible for the efficient and cost-effective execution of capital investment programs and projects to maintain and improve MWRA facilities. Working with Procurement and Law, propose methods to streamline the Authority's capital delivery system.
- Manages the responsibility for stewardship of MWRA physical and plant assets.
- Assumes the responsibility for providing safe MWRA operations for the MWRA workforce, its customers and the general public and provides input into security and emergency preparedness and response regarding the system. Works closely with Manager, Occupational

Health and Safety on safety issues.

- Manages the impacts of MWRA construction on community water/sewer systems, through coordination with community system managers and the Advisory Board Operations Committee.
- Works collegially with and ensures coordination with other MWRA divisions and departments and advances the goals, objectives and strategies of the MWRA business plan.
- Assists in implementing the goals and commitments of MWRA in the areas of customer service, diversity and affirmative action, economy and efficiency, health and safety, emergency response and security, and integrity and public trust.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) A bachelor's degree in sanitary, civil or mechanical engineering or associated field. Advanced degree or other significant post-graduate educational experience in an engineering discipline is preferred; and
- (B) Eight (8) to ten (10) years demonstrated success in progressively responsible management positions in operations, maintenance, engineering design, engineering project management and/or construction functions relating to water/wastewater service delivery and major water/wastewater facilities; water system experience is preferred; or
- (C) Other combinations of educational and professional credentials and senior operations-management-engineering-construction experience in the water/wastewater sector will also be considered.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of principles and practices of engineering.
- (B) Expert familiarity and management competence in the operation, maintenance and construction of water and wastewater facilities and systems.
- (C) Ability to provide technical leadership to subordinate employees in the areas under supervision and inspire confidence in customers and the general public.
- (D) Excellent interpersonal, oral and written communications skills required.

### **SPECIAL REQUIREMENTS:**

Registered Massachusetts Professional Engineer license required.

A valid Massachusetts Class D Motor Vehicle Operators License.

Must be available for on-call assignments and to respond to emergencies on a 24/7 basis using a MWRA domicile vehicle.

### **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:**

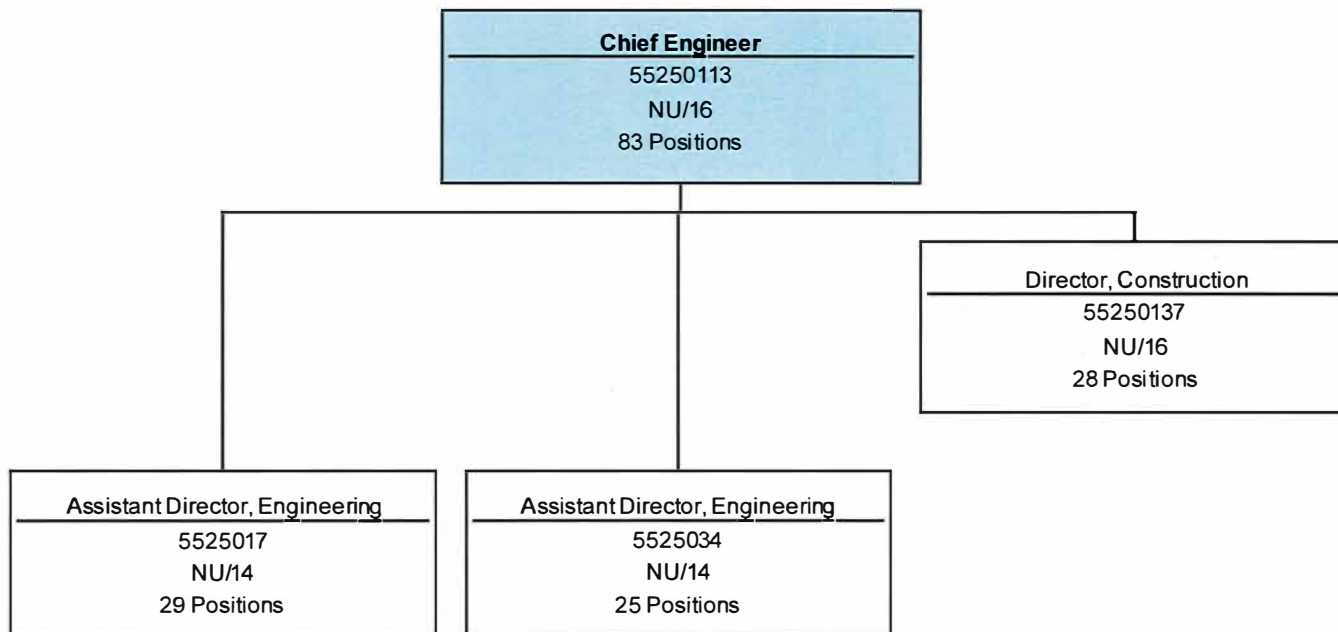
The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. While performing the duties of this job, the employee regularly works in an office environment.

While performing the duties of this job, the employee occasionally works in outside weather conditions. The employee works near moving mechanical parts is occasionally exposed to wet and/or humid conditions. The employee is occasionally exposed to fumes and airborne particles, toxic or caustic chemicals, and risk of electric shock.

The noise level in the office environment is usually moderately quiet and is moderately loud in field settings.

**December 2018**

**Engineering & Construction**  
December 2018



## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director  
**DATE:** December 19, 2018  
**SUBJECT:** Appointment of Assistant Director, Engineering  
Engineering & Construction Department



**COMMITTEE:** Personnel & Compensation

INFORMATION  
 VOTE

Andrea Murphy, Director, Human Resources  
J. Colbert, P.E., Acting Chief Engineer  
Preparer/Title



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

### RECOMMENDATION:

To approve the appointment of Ms. Lisa Hamilton to the position of Assistant Director, Engineering (Non-Union, Grade 14) in the Engineering & Construction Department, at an annual salary of \$138,813.00, commencing on a date to be determined by the Executive Director.

### DISCUSSION:

There are two Assistant Director positions in the Engineering & Construction Department; one for Waterworks and one for Wastewater Engineering. The Waterworks Assistant Director position became vacant in September 2018 as a result of the promotion of the incumbent. The Assistant Director, Engineering position reports directly to the Chief Engineer, manages 28 in-house engineering staff, and directs numerous consultant contracts. This position oversees the development and administration of capital improvement and current expense projects as well as the development of environmentally sound solutions to engineering problems. It also assists in the preparation of and oversees the department's capital improvement budget. The Assistant Director, Engineering provides supervision and technical oversight to engineering staff and is responsible for managing projects within the Engineering section. The Assistant Director, Engineering oversees and coordinates staffing resources, considering project workload to assure consistency of project execution and quality, and adherence to MWRA policy and procedures.

### Selection Process

This Assistant Director position was posted internally and externally. A total of six candidates applied for the position. One internal and three external candidates were determined to be qualified and were referred for an interview. The Acting Chief Engineer; Director Design and Construction, Tunnel Redundancy; Director of Waterworks, and the Special Assistant for Affirmative Action



conducted the interviews. Upon completion of the interviews, Ms. Lisa Hamilton was determined to be as the best candidate based on her experience, knowledge, skills and education.

Ms. Hamilton has 33 years of engineering experience, including 26 years at the MWRA serving in progressively responsible positions. She currently holds the position of Senior Program Manager. Ms. Hamilton has extensive experience working on planning and design of capital projects including Weston Aqueduct Supply Mains Rehabilitation, Chestnut Hill Connecting Mains Final Connections, Low Service Storage near Spot Pond, Chicopee Valley Aqueduct, and Southern High Service Area Extension Study. Ms. Hamilton also served as Construction Coordinator for six years and worked successfully managing the construction of the Spot Pond Tank, Gillis Pump Station Short-Term Improvements, North Dorchester Bay CSO Tunnel, Pump Station and Vent Building, and East Boston Branch Sewer Replacement. She is currently responsible for the Commonwealth Avenue Pumping Station Rehabilitation Design contract that is being bid. She has demonstrated her experience managing professional services contracts and has successfully supervised and provided technical support to staff. Prior to her employment at MWRA Ms. Hamilton worked for seven years at three engineering consulting firms, where she worked on sewerage pump station design and combined sewer overflow evaluations. During her 26 years at the MWRA, Ms. Hamilton has earned the respect of her colleagues and supervisors.

Ms. Hamilton earned a Bachelor of Science degree in Civil Engineering from Tulane University and a Master of Science degree in Civil Engineering from Northeastern University. She is also a registered Professional Engineer in Massachusetts. Ms. Hamilton received the Boston Society of Civil Engineers President's Award in 2001 and the East Boston Branch Sewer Replacement Project received the 2011 Trenchless Technology Rehabilitation award.

**BUDGET/FISCAL IMPACT:**

There are sufficient funds in the FY19 CEB for this position.

**ATTACHMENTS:**

- Resume of Lisa Hamilton
- Position Description
- Organization Chart

## LISA L. HAMILTON, P.E.

**EDUCATION:** BSCE, Tulane University, 1985  
MSCE, Northeastern University, 1991

### EXPERIENCE:

#### MASSACHUSETTS WATER RESOURCES AUTHORITY

##### Engineering

###### Senior Program Manager

**November 2014 – present**

- Current self-managed consultant projects: Commonwealth Avenue Pump Station Improvements.
- Current staff managed projects: Weston Aqueduct Supply Main 3 pipeline rehabilitation; Intermediate High Improvements (Sections 25, 24, 47, 59, 60 & 75); Rehabilitation of Sections 23, 24 & 47; Cathodic Protection replacements at Shafts E & L; Section 50/57 (water) and Sections 19/20/21 (sewer) rehabilitation; Chestnut Hill Emergency Pump Station Improvements; Low Service Pressure Reducing Valve Improvements; Painting for Bellevue 2 and Turkey Hill Steel Water Storage Tanks; Painting for Deer Island Steel Water Storage Tank; Peabody Pipeline.
- Duties: Manage and supervise professional multi-disciplinary engineering and design projects related to improvements in the MWRA water and wastewater facilities and infrastructure from planning through construction award; ensure compliance with contract budgets and schedules; review project deliverables including design reports and contract documents for compliance with scope and project goals; support annual and supplementary reviews of Capital Improvement Program budgets, schedules and narratives; prepare and review project schedules and budgets and review and recommend payment of invoices; participate in consultant selection procedures, contract negotiations and prepare contract award recommendations; coordinate projects with other MWRA divisions and departments as well as communities and government agencies; MEPA reviews; manage professional staff including hiring and timesheet approvals.

##### Construction Unit

###### Construction Coordinator

**September 2008 – November 2014**

- Managed the construction of an underground 20-million-gallon concrete drinking water storage facility and pump station at the former Boston Regional Medical Center site near Spot Pond in Stoneham. The project is intended to provide system storage and stabilize pressures in the Northern Low Service area. The pump station is partially underground and supplements the Gillis Pump Station by providing pumping redundancy to the Northern High and Northern Intermediate High Service areas. The \$50 million contract was completed in 2016 using a Design/Build project delivery method.
- Managed the construction of short-term improvements to the Gillis Pump Station in Stoneham. The work included replacement of a 17-mgd constant-speed pump with a smaller, more efficient 4.3-mgd pump with a variable frequency drive (VFD), the addition of two more VFDs on two existing pumps, and the addition of a hydraulic pressure relief system to further protect the system from water hammer resulting from a sudden and unanticipated power failure. Total value of \$2.2 million.
- Managed the construction completion and start-up of federal court ordered combined sewer overflow (CSO) improvements in South Boston. The North Dorchester Bay CSO Control Plan eliminated CSO discharges and greatly reduced stormwater discharges to South Boston beaches. The plan consisted of a 17-foot diameter 11,000-foot soft ground tunnel; a 15-mgd dewatering pump station at the Massport Conley Terminal and 4,000 feet of gravity and force main sewers (\$27 million); and a ventilation building at the upstream end of the tunnel (\$5.5 million).

- Managed the construction of federal court ordered sewer improvements in East Boston that significantly reduced the frequency and volume of combined sewer overflows to Boston Harbor by replacing the 113-year-old East Boston Branch Sewer with either larger replacement or rehabilitated pipelines. The program included 2 professional service contracts and 2 construction contracts with a total value of \$78.5 million. The improvements included the installation of 2.5 miles of 24-, 36-, 48- and 66-inch-diameter combined sewers, primarily by microtunneling, and replacement of one mile of existing 12- and 15-inch-diameter clay pipes with 16- and 20-inch diameter high density polyethylene pipes, primarily by pipebursting.

**Water Engineering Unit (formerly CECD)**

**Design Manager**

**June 1996 – September 2008**

Duties:

- Prepare Request for Qualification/Proposals and conduct the consultant selection process for professional services contracts. Manage study, preliminary design, final design, construction administration and resident inspection contracts: negotiations, award, budgets, invoices, amendments, consultant progress meetings and review of deliverables. Coordinate design with Construction, Operations, communities, agencies and obtain required permits. Prepare plans and specifications for construction contracts for capital improvements: advertising, addenda, bid evaluations and award. Manage engineering services during construction, including regular attendance at contractor progress meetings at the field office to ensure the design intent was upheld, observation of the work at the construction site, document the work performed and to prepare record drawings and detail records.

Projects:

- Weston Aqueduct Supply Mains Rehabilitation. Rehabilitation will increase their useful life, restore flow capacity and improve water quality. Rehabilitation includes replacement, slip-lining and cleaning & lining of 36 miles of 16, 20, 48 and 60-inch diameter cast-iron, steel and prestressed concrete cylinder pipes and 1-mile of cured-in-place rehabilitation of a 54 x 61.5-inch brick sewer. The program includes 6 professional service contracts and 13 construction contracts with a total value of \$125 million.
- Chestnut Hill Connecting Mains, Final Connections. Preliminary design completed for Chapter 30 and Chapter 149 system improvements and dam safety inspection & assessment at Chestnut Hill and Waban Hill Reservoirs.
- Low Service Storage near Spot Pond. Concept design for 20-million gallon covered storage facility. Special legislation was obtained to allow project to proceed as a 'design-build' contract.
- Chicopee Valley Aqueduct. Conducted consultant selection process, contract award and Initiated design work for 36-48-inch diameter, 12-mile transmission main.
- Southern High Service Area Extension Study: 15-18 miles of pipelines, 1 or 2 pump stations and storage to supplement water service (10 mgd) to 8 communities, construction estimate of \$40 million.

**Toxic Reduction and Control (TRAC)**

**Acting Manager**

**September – November 2000**

- Managed the Compliance Section; total staff of 50 including 8 direct reports. Section conducts annual Significant-Industrial-User Workshops, issues annual invoices and municipal permit applications, conducts sampling, and is in charge of enforcement of discharges to the sewer system.

**Capital Engineering & Construction Department (CECD)**

**Project Manager**

**June 1994 - June 1996**

- Newton Water Main Rehabilitation. Managed the bidding, award and construction administration tasks. Issued addenda and completed the bidding and contractor selection process. Reviewed shop drawings and attended coordination meetings with the city, contractor and field staff. In order to

remove Newton's Meter 104 and 105 from active service during the rehabilitation of WASM 4, the MWRA agreed to clean and line two 12-inch diameter city mains to improve flow capacity.

- WASM 3 to Shaft 7 Connecting Mains Routing Study. Performed initial evaluation and justification including extensive hydraulic modeling of alternatives using the MWRA's computer hydraulic model. The recommended improvements included \$46 million in new (6 miles) pipelines and rehabilitated (12 miles) pipelines.
- Hydraulic Model. Upgraded VAX/VMS system to PC Windows. Scoped new CIP project to upgrade our data files to better utilize the new software features and update our system improvements.

#### **Maintenance Engineering & Construction Department (MECD)**

##### **Project Engineer**

**November 1992 - June 1994**

- Prepared scope reports, plans and specifications for in-house design of capital improvements, including: Emergency repair of a 12-inch diameter blow-off on Section 22 in Milton; Replacement of a portion of Section 7 near the Spot Pond Pump Station in Stoneham; Rehabilitation of a portion of Weston Aqueduct Supply Main 4 (14W Nonantum Road) and Section 27 in Lynn.

##### **METCALF & EDDY, INC.**

**April 1990 - October 1992**

- Project Engineer in the Wastewater group. Prepared a series of technical memoranda and facilities plan for the Braintree-Weymouth Interceptor and Pumping Station. Prepared an enforcement response plan and local limits for the industrial pretreatment program at the water pollution control plant in Westfield, Massachusetts. Other duties: surveys, record drawings, odor study and plan of operations.

##### **RIZZO ASSOCIATES, INC.**

**February 1988 - April 1990**

- Project Engineer on the Boston Water and Sewer Commission Combined Sewer Overflow (CSO) Monitoring and Evaluation Program; work included monitoring and predicting the frequency and volumes of overflow using a computer model. Prepared contract documents, advertised and analyzed bids, reviewed shop drawings and inspected installation of a water main in Bellingham, Massachusetts.

##### **BETHEL, DUNCAN & ASSOCIATES, INC.**

**June 1985 - February 1988**

- Prepared contract documents for new and reconstruction roadway projects, evaluation and design of sewage pumping stations. Involved in surveys, soil borings, monitoring wells, bid advertising, receipt and evaluation of bids, award recommendation, review of shop drawings and preparation of contractor payment estimates and change orders.

**AFFILIATIONS:** American Society of Civil Engineers (ASCE)  
Boston Society of Civil Engineers (BSCE)  
Past Chair BSCE Engineering Management Group  
Past Member BSCE Nominating Committee

**AWARDS:** Boston Society of Civil Engineers, Presidents Award, 2001  
Trenchless Technology, East Boston Sewer, Rehabilitation Winner, October 2011

**PUBLICATIONS:** Co-authored and presented a Technical Paper for AWWA Annual Conference, June 1997, titled "A Systematic Approach to Major Pipeline Rehabilitation".  
Co-authored a Technical Paper for NASTT No-Dig Show, May 2010, titled "Trenchless Construction Hurdles in an Urban Environment: The East Boston Branch Sewer Project".

**REGISTRATION:** Professional Engineer, Commonwealth of Massachusetts

**MWRA  
POSITION DESCRIPTION**

**POSITION:** Assistant Director, Engineering

**PCR#:**

**DIVISION:** Operations

**DEPARTMENT:** Engineering and Construction

**BASIC PURPOSE:**

Assists in the direction of all aspects of engineering capital projects and current expense projects, including conceptual development planning, design and pre-construction for assigned unit.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Chief Engineer

**SUPERVISION EXERCISED:**

Exercises close supervision of the assigned unit.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Directs the development and administration of capital improvement and current expense projects within the assigned unit. Develops funding plans for projects; assists in the preparation of and oversees the department's capital improvement budget.
- Assists in the evaluation of solutions to engineering problems and develops environmentally sound solutions.
- Oversees the work of staff and consulting engineers to insure adherence to budgets, schedules, quality of outputs and compliance with scope of services and contract terms.
- Oversees coordination of projects and engineering functions with appropriate MWRA Divisions and sees that projects comply with MWRA policies and procedures.
- Recommends and develops agency, program, or department policy by analyzing all pertinent issues and information regarding the impact of proposed policy on the provision of services to clients, consumers, or the general public and by determining the resources necessary to implement such policy.

- Maintains communication with local, State, and Federal agencies, professional organizations and community groups to provide information on and gain support for programs.
- Participates in preparing for collective bargaining and hears Step One Grievances.
- Develops and oversees current expense budget for assigned unit.
- Oversees and coordinates staffing with project workload to assure consistency of project execution and quality, and adherence to Massachusetts Water Resources Authority's policy and procedures.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) A four (4) year college program in engineering or a related field. Graduate degree preferred; and
- (B) An understanding of water and/or wastewater engineering and contract construction management as acquired by a minimum of twelve (12) years experience including at least four (4) years in a supervisory position.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of engineering practices and principles.
- (B) A general understanding of engineering principles and practices.
- (C) Demonstrated verbal and written communication skills.

**SPECIAL REQUIREMENTS:**

A Massachusetts Registered Professional Engineer.  
A 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, and copy 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.

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

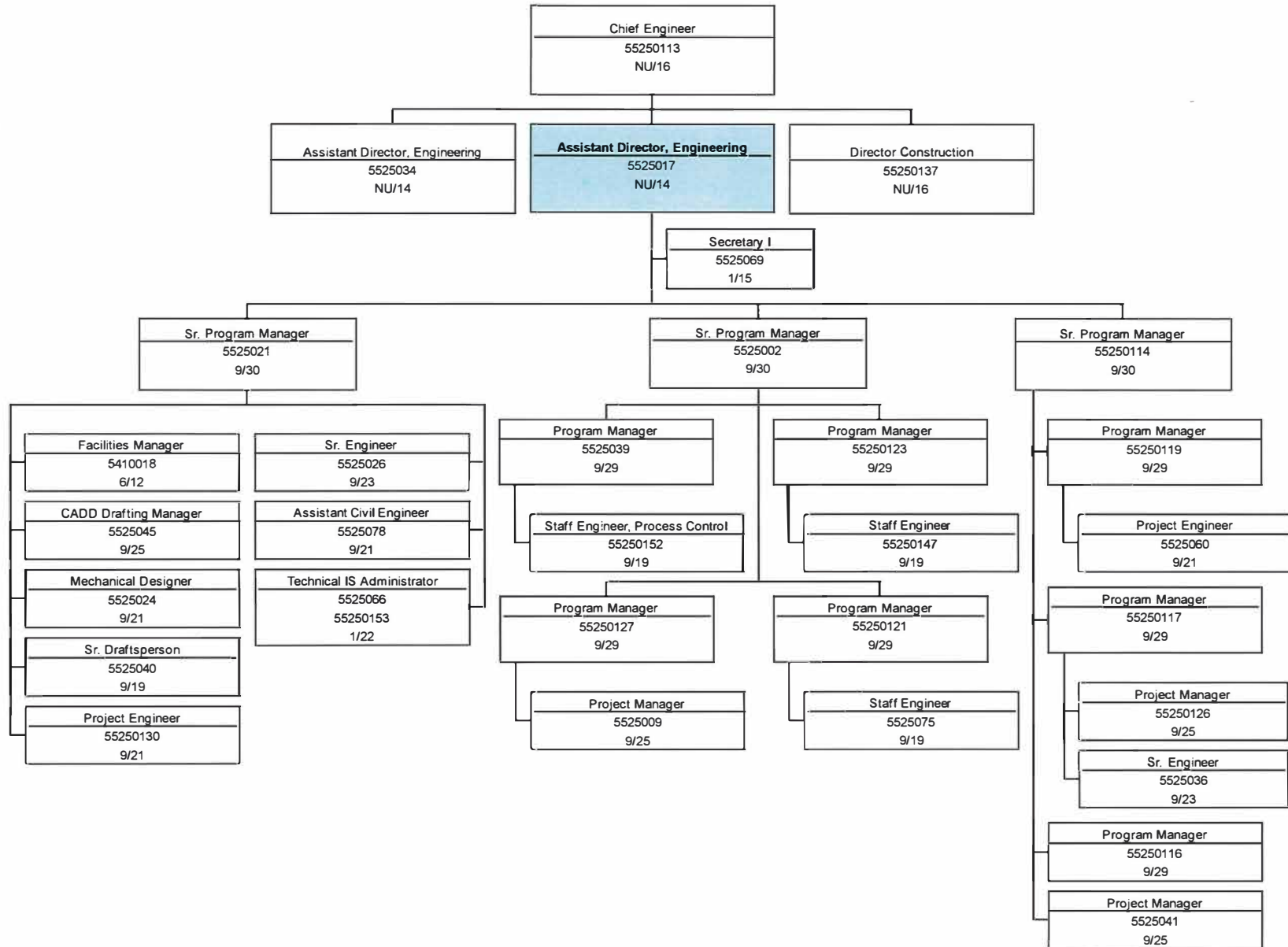
### **WORK ENVIRONMENT:**

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.

**February 2017**

**Engineering & Construction  
Water/Wastewater Engineering  
December 2018**





## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Appointment of Manager of Design, Tunnel Redundancy Department

---

**COMMITTEE:** Personnel & Compensation

Andrea Murphy, Director, Human Resources  
Preparer/Title

INFORMATION

VOTE

  
Kathleen Murtagh

Director, Tunnel Redundancy

---

### RECOMMENDATION:

To approve the appointment of Ms. Colleen Rizzi to the position of Manager of Design, Tunnel Redundancy Department (Non-Union, Grade 14) at an annual salary of \$135,000, commencing on a date to be determined by the Executive Director.

### DISCUSSION:

On July 18, 2018, the Board of Directors voted to approve the Proposed Tunnel Redundancy Program Organization and to create three new positions to support the Program. Colleen Rizzi is being recommended to fill one of the new positions; the Manager of Design.

The Tunnel Redundancy Department will oversee the planning, design, construction, procurement, budget, schedule, and quality management aspects of the Program. The Manager of Design will serve as a design manager for the Metropolitan Tunnel Redundancy Program and will perform a leadership role in the newly formed Tunnel Department.

### Selection Process

The position was posted internally and externally. Three internal and six external candidates applied. Three internal and two external candidates were interviewed by the Director of Tunnel Redundancy, the Director of Design and Construction, and the Special Assistant for Affirmative Action. Ms. Rizzi was deemed the best candidate for this position based on her experience, abilities, knowledge and education.

Ms. Rizzi has over 18 years of progressive experience in the design and project management in both the public and private sector with an emphasis on utility and infrastructure design, regulatory compliance and construction administration. She was the Manager of Capital Design for a public water/sewer agency in Virginia for approximately five years before relocating back to Massachusetts. She directed a staff of professional engineers and oversaw 40+ projects per year at an estimated contract value of \$15 million to \$25 million per year. She has experience with the design, permitting, bidding, and award of large diameter pipeline and tunnel projects.

Ms. Rizzi has a Bachelor of Science in Civil Engineering from Northeastern University and is a licensed professional engineer in the Commonwealth of Massachusetts.

Ms. Rizzi demonstrated an understanding of tunnel design and experience in program management, quality control, and risk management. Her past experience as a department head, execution of major capital improvement projects, and leadership skills make her an excellent choice as the Manager of Design for the Metropolitan Tunnel Redundancy Program.

**BUDGET/FISCAL IMPACTS:**

There are sufficient funds in the FY19 CEB for this position.

**ATTACHMENT:**

Colleen Rizzi Resume  
Position Description  
Organizational Chart - Updated

*Colleen C. Rizzi, P.E.*

---

*Executive Summary*

Management professional offering more than 18 years of design and project management experience in both the private and public sector, with an emphasis on utility and infrastructure design, regulatory compliance, and construction administration, in addition to significant experience in stormwater management and water resources. Licensed professional engineer in Massachusetts and Virginia, and active participant in industry initiatives. Recognized by peers and leaders in the organization as a highly effective team leader, and for successful implementation of major capital improvement projects, including new construction and rehabilitation of existing water and wastewater facilities. Key projects include large scale water and wastewater facilities incorporating trenchless technologies and tunneling. Responsible for quality assurance and quality control across all projects. Management experience adaptable to various organizational structures. Excellent communication skills, frequent presenter to Board of Directors and at industry conferences.

*Professional Experience*

Project Manager September 2017-Present  
*Vanasse Hangen Brustlin, Inc.* *Watertown, MA*

Project Manager responsible for the design, permitting and construction administration for higher education clients and Federal clients. Current projects include six design and construction projects adjacent to each other for the same university, requiring detailed coordination on both design and logistics relating to permitting and construction. Key aspects include:

- Performing Boston Water and Sewer Commission (BWSC) inspections on behalf of the Commission for water, sewer, and stormwater facilities during construction to ensure compliance;
- Serving as Resident Engineer overseeing all aspects of linear construction and coordination on behalf of the Owner;
- Performing ongoing design and multidisciplinary coordination;
- Developing and implementing ongoing quality assurance processes.

Manager of Capital Design July 2012 – June 2017  
*Loudoun County Sanitation Authority d/b/a Loudoun Water* *Ashburn, VA*

Began as a Project Engineer in July 2012 managing large scale water and wastewater projects, and was promoted to Manager of Capital Design in October 2014. As Manager of Capital Design was responsible for leading a team of 5 engineers and, as head of my department, was responsible for 40-50 projects simultaneously, with an estimated contract value of \$15M to \$25M annually for design services. Also, responsible for contract administration with outside design consultants, including scope, fee, and schedule. My role required a programmatic approach to projects as many were related or could impact another initiative. Also, responsible for quality assurance on all projects and for developing standard operating procedures within the Planning and Engineering Department; served on multiple technical committees representing the Planning and Engineering Department. Significant contributor to the 10-year Capital Improvement Program, estimated at \$900M for 2017-2026, and responsible for resource allocation and staffing associated with all design projects. Provided engineering and contract support across the organization requiring close coordination with Operations and Maintenance Staff, Procurement, and Legal Counsel. Actively engaged with my team, guiding junior and senior engineers along their career paths.

As a Project Engineer responsible for facilitating project design, permitting, and construction. Through the design process obtained consensus from internal stakeholders, as well as actively engaged external stakeholders ranging from customers, impacted landowners, non-governmental organizations, and permitting

*Colleen C. Rizzi, P.E.*

---

officials. Secured \$10M grant from Virginia Department of Environmental Quality for enhanced nitrogen removal upgrades at DC Water's Blue Plains Advanced Wastewater Treatment Facility.

Key projects include:

- Wastewater treatment plant upgrades and expansion, potable water treatment plant rehabilitation and expansion, sewer collection system design, reclaimed water infrastructure, and drinking water supply distribution.
- Design, permitting, bidding and award of 5 miles of large diameter sewer collection system, including 5 tunnels of varying lengths and depths.
- \$30M acquisition of 800 acres of land, two reservoirs and dams, and water treatment plant from neighboring jurisdiction, including due diligence studies for environmental assessments, assisting legal counsel with review of contractual documents for technical components, oversight of design and construction of improvements, and operational startup of facilities after acquisition. Responsible for planning, design and implementation of these improvements (\$1M value) in a 6-month timeframe so it was online by peak demand season.

Project Manager

*Vanasse Hangen Brustlin, Inc.*

June 2000-July 2012

*Watertown, MA; Vienna, VA*

Began as a Staff Engineer in 2000, following co-ops from 1997 to 2000, and was promoted to Project Engineer in 2003, Senior Project Engineer in 2006, and Project Manager in 2008. Became an Associate (shareholder) in 2007. Responsible for design, permitting, and construction administration for institutional, Federal, and commercial projects across multiple states, including stormwater management and low impact design. Performed a number of design and construction of linear projects for Massachusetts Ports Authority (MassPort). Construction administration included response to RFIs, change order review. Responsible for oversight of a fast-paced design and construction program in the Mid-Atlantic, including feasibility studies and due diligence. Taught Introduction to Hydrology and Hydraulics in the accredited VHB Center for Education.

***Education***

Bachelor of Science in Civil Engineering, cum laude

*Northeastern University*

2000

*Boston, Massachusetts*

Candidate for Masters of Science in Environmental Planning and Management

*Johns Hopkins University*

2020 (est.)

*Baltimore, Maryland*

- Courses completed include Water Resources Management; Environmental Law for Engineers and Scientists, Climate Change and Global Environmental Sustainability, Environmental Project Management
- Future courses will include Designing for Sustainability: Applying a Decision Framework, Environmental Policy Analysis, Communication of Environmental Information and Stakeholder Engagement

***Professional Certifications***

Licensed Professional Engineer, VA (2009), MA (2004)

●SHA 10 Certification

I recently completed course training for the Project Management Institute's Project Management Professional (PMP) exam and plan to take the exam this Fall.

**MWRA  
POSITION DESCRIPTION**

**POSITION:** Manager, Design

**DIVISION:** Tunnel Redundancy

**DEPARTMENT:** Tunnel Redundancy

**BASIC PURPOSE:**

Manages engineering and design projects related to the Metropolitan Tunnel Redundancy Program as well as rehabilitation and capital improvement of other water and wastewater facilities and infrastructure. Under the direction of the Director, Design and Construction implements, manages, coordinates, controls and performs quality assurance/quality control on policies and procedures for shaft and tunnel projects from planning through construction award to ensure design and construction projects comply with approved schedules and budgets.

**SUPERVISION RECEIVED:**

Works under general supervision by the Director, Design and Construction (Tunnel Redundancy Department).

**SUPERVISION EXERCISED:**

Directly manages professional staff and consultants.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Supervises professional multi-disciplinary design work of large and complex projects applying professional engineering principles and exercising independent judgment.
- Serves as a lead design engineer during the planning and design of the tunnel systems related to the Tunnel Redundancy Program, including developing concept designs and/or reviewing designs received from consultant engineering firms which involves the oversight and management of schedules and budgets. Implements program design standards including CADD.
- Performs engineering analysis, prepares engineering documents, and writes project reports.
- Develops design schedules and design budgets ensuring fundamental management controls, techniques, accountability for projects related to the Tunnel Redundancy Program.

- Ensures safe MWRA operations for MWRA employees, constituents, and the general public.
- Implements and administers the program management plan and program to ensure timely and cost-effective delivery of the Tunnel Redundancy Program. Implements control and tracking methods and procedures to ensure project compliance with approved budgets and schedules. Reports the status of projects to senior management including any issues that impact schedules and budgets. Develops and provides proposals to address budget or schedule non-compliance issues.
- Determines design delivery methods, specification types, and schedules for projects supporting the Tunnel Redundancy Program. Ensures projects are implemented using comprehensive work plans and resources by selecting consultant services groups that deliver a technically sound, controlled project on budget and on time.
- Participates in consultant selection procedures and contract negotiations for projects. Additionally, oversees applicable phases of consultant selection for assigned projects including developing scope of services, specifications, cost estimates, work schedules, negotiations, and preparing contract award recommendations. Ensures compliance with contract budgets, schedules, and terms.
- Oversees the work of professional engineering consultants for large tunneling projects, including all work products for quality of work, budget, schedule, and compliance with contractual terms and MWRA objectives and policies.
- Reviews work of professional engineering consultants related to alternative analysis, tunnel alignment and shaft location selection, hydraulic analysis, groundwater treatment and discharge, connections to existing MWRA systems, long term operations, design reports, and contract documents (plans and specifications).
- Monitors the professional engineering consultants' efforts to identify and mitigate potential sources of project delays during the design and construction phases.
- Administers the monitoring, control, schedule & budget for projects using scope control, performance reports, change requests and cost management/control using integrated time/cost management controls.
- Supports annual and supplementary budget requests for the Tunnel Redundancy Program in the Capital Improvement Program. Reviews projects' budgets and schedules for compliance with established department, division, and MWRA program goals.
- Prepares and reviews project schedules and budgets, and reviews and recommends payment of invoices.
- Reviews project change orders and cost estimates and identifies new project funding requirements.

- Implements a Quality Assurance/Quality Control (QA/QC) plan for the program to ensure a project's fast tracking and the effect on contract document preparation that will result in a technical, effective and constructible projects. Administers quality management during design and construction process. Ensures that fundamentals and recommended practices and procedures for QA/QC are followed and managed by staff.
- Assists in the development of risk management plans and quality plans for tunneling projects and participates in overseeing their implementation.
- Manages professional staff, including assigning projects, evaluating performance, and planning staff development.
- Provides technical and administrative assistance to staff in the development and management of projects which include design and engineering services during construction of the Tunnel Redundancy Program as well as new and rehabilitation water and wastewater projects.
- Develop safety procedures by working closely with MWRA Safety staff.
- Works effectively and in conjunction with Procurement, Law, Operations and Administration divisions. Develops clear schedules and costs associated with all projects from both in-house and consultant teams.
- Assists with project development of work breakdown and construction packaging. Coordinates cooperative project development with other MWRA divisions and departments to ensure complete and coordinated projects. Coordinates projects with communities, government agencies and other MWRA departments. Provides technical information and assistance. Assists in addressing professional and community groups and initiates outreach projects as required.
- Assists with compliance with MWRA procedures and policies, local, state, and federal environmental regulatory requirements and applicable engineering standards.
- In coordination with MWRA senior staff, supports all project activities and coordinates with MWRA divisions and departments, outside regulatory and permitting agencies and communities, as appropriate.
- Works collegially with and coordinates with staff in other MWRA divisions and departments and advances the goals, objectives and strategies of the MWRA business plan.
- Assists in implementing the goals and commitments of MWRA in the areas of customer services, diversity and affirmative action, economy and efficiency, health and safety, emergency response and security, integrity, and public trust.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) A bachelor's degree in civil or geotechnical engineering or associated engineering field; and
- (B) At least ten (10) years demonstrated success in progressively responsible management positions in engineering design, project management and/or construction functions; and
- (C) At least three (3) years' experience in a supervisory capacity; or
- (D) Any equivalent combination of education or experience.
- (E) Preferred qualifications: An advanced degree or other post-graduate study in civil engineering. Experience relating to shaft and tunnel systems. Knowledge of principles and practices of geotechnical and/or tunneling engineering. Experience with alternative delivery methods on large complex underground projects. Design or construction experience on a megaproject(s) (i.e., projects over \$1B). Experience with major water/wastewater facilities or water systems.

Necessary Knowledge, Skills and Abilities:

Knowledge of principles and practices of civil engineering. Understanding of issues related to design, construction and operation of large and complex water and wastewater facilities and infrastructure. Demonstrated ability to work effectively as part of a collaborative project team and also to function independently with minimal supervision.

Knowledge of Massachusetts bidding laws, including M.G.L Chapter 30 and Chapter 149 construction bidding regulations.

Knowledge of environmental regulations and permitting requirements.

Proficiency with computer software such as Microsoft Office Suite and CADD.

Ability to provide program management leadership to engineering managers and staff engaged in engineering programs, projects and activities.

Excellent interpersonal, written, and oral communication skills.



**SPECIAL REQUIREMENTS:**

A valid Massachusetts Class D Motor Vehicle Operators License.

Massachusetts license as a Registered Professional Engineer. (P.E.)

Preferred qualifications: Certification by the Project Management Institute as a Project Management Professional (PMP).

**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 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 stand, walk, climb or balance, stoop, kneel, crouch, or crawl, taste or smell.

The employee must frequently lift and/or move up to 10 pounds. Specific vision abilities required by this job include close vision, distance vision, color vision, depth perception, peripheral 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.

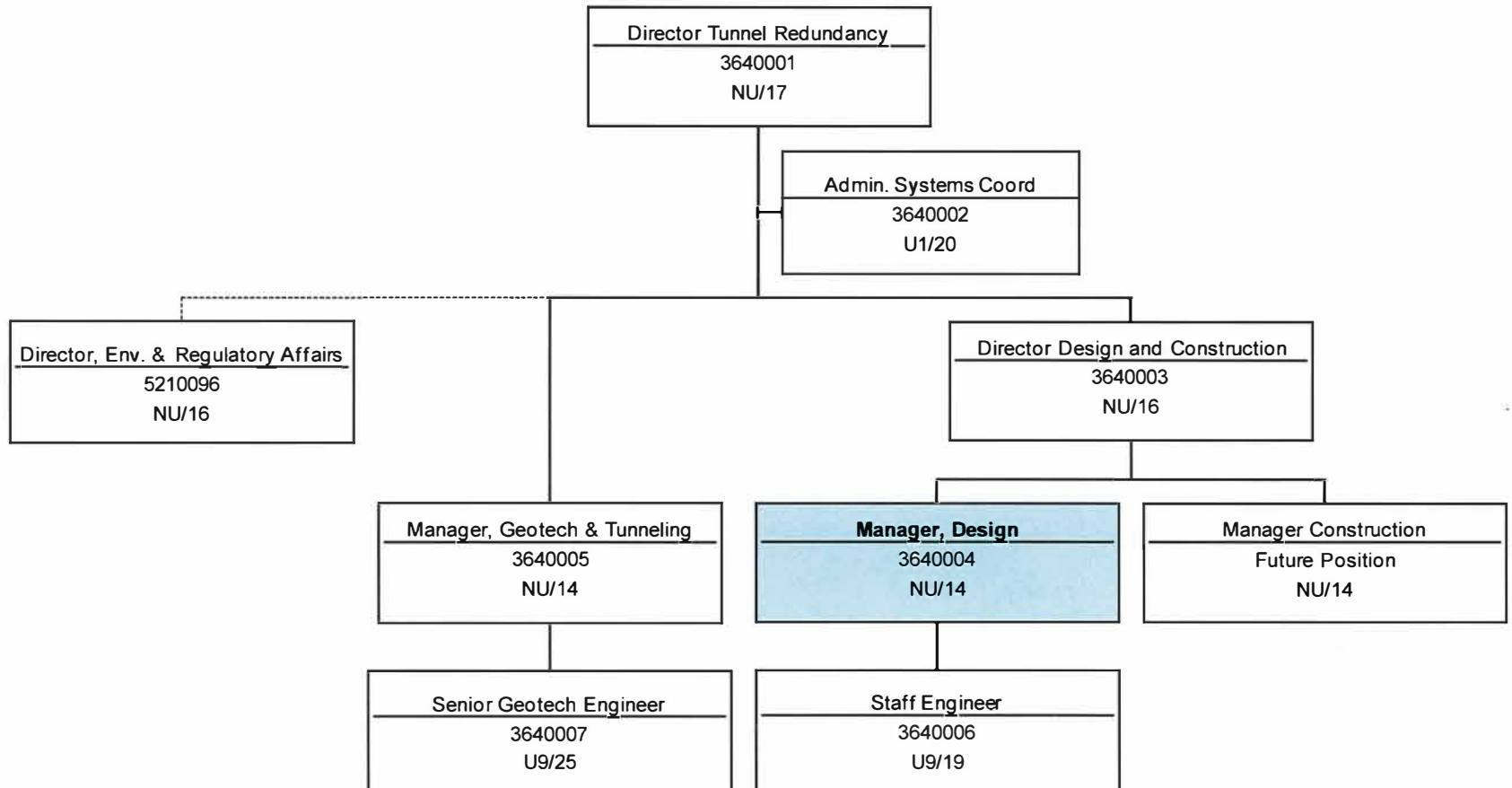
While performing the duties of this job, the employee regularly works in an office environment. While performing the duties of this job, the employee occasionally works in outside weather conditions. The employee occasionally works near moving mechanical parts, and is occasionally exposed to wet and/or humid conditions and vibration. The employee occasionally works in high or underground precarious places and is occasionally exposed to fumes or airborne particles, toxic or caustic chemicals and risk of electrical shock.

The noise level in the work environment is usually loud in field settings and moderately quiet in an office setting.

**June 2018**

# Tunnel Redundancy Division

December 2018



## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director  
**DATE:** December 19, 2018  
**SUBJECT:** Appointment of Manager of Geotechnical and Tunneling  
Tunnel Redundancy Department



---

**COMMITTEE:** Personnel & Compensation

           INFORMATION

  X   VOTE

Andrea Murphy, Director, Human Resources  
Preparer/Title

*Kathleen Murtagh*  
Kathleen Murtagh

Director, Tunnel Redundancy

---

### RECOMMENDATION:

To approve the appointment of Ms. Wing Yan Vivian Chan to the position of Manager of Geotechnical and Tunneling, Tunnel Redundancy Department (Non-Union, Grade 14) at an annual salary of \$135,000, commencing on a date to be determined by the Executive Director.

### DISCUSSION:

On July 18, 2018, the Board of Directors voted to approve the Proposed Tunnel Redundancy Program Organization and to create three new positions to support the Program. Vivian Chan is being recommended to fill one of the new positions; the Manager of Geotechnical and Tunneling.

The Tunnel Redundancy Department will oversee the planning, design, construction, procurement, budget, schedule, and quality management aspects of the Program. The Manager of Geotechnical and Tunneling will serve as a geotechnical design manager for the Metropolitan Tunnel Redundancy Program and will perform a leadership role in the newly formed Tunnel Department.

### Selection Process

The position was posted internally and externally. Five external candidates applied. Two external candidates were interviewed by the Director of Tunnel Redundancy, the Director of Design and Construction, and the Special Assistant for Affirmative Action. Ms. Chan was deemed the best candidate for this position based on her experience, abilities, knowledge and education.

Ms. Chan has over 12 years of progressive experience in geotechnical and tunnel design and construction as well as project management and leadership experience. She has extensive experience in geotechnical investigations, foundation design, retaining walls and excavations support, geotechnical instrumentation, blasting, dewatering, grouting, and trenchless installations. She manages a staff of geotechnical engineers and oversees numerous large projects each year.

She has experience with the investigation, design, bidding, award, and construction of complex underground projects including those involving blasting, large earthwork, ground improvement, micro tunneling, directional drilling, shaft and rock tunnel project. She also has experience in alternative delivery methods and has served as a design engineer on several mega-projects.

Ms. Chan has a Bachelor of Science in Civil Engineering from the University of Hong Kong, a Master's of Science in Civil Engineering with an emphasis in Geo-Engineering from the University of California, Berkeley, and is a licensed professional engineer in the Commonwealth of Massachusetts.

Ms. Chan demonstrated a solid understanding of geotechnical engineering, risk management, and project management. She has experience in all phases of mega-project execution. She demonstrated a level of thoughtfulness and leadership skills that make her an excellent choice as the Manager of Geotechnical and Tunneling for the Metropolitan Tunnel Redundancy Program.

**BUDGET/FISCAL IMPACTS:**

There are sufficient funds in the FY19 CEB for this position.

**ATTACHMENT:**

Wing Yan Vivian Chan Resume  
Position Description  
Organizational Chart

# Wing Yan Vivian Chan, P.E.

---

## Education

**M.S. CIVIL ENGINEERING (GEO-ENGINEERING) | 2006 | UNIVERSITY OF CALIFORNIA, BERKELEY**  
**B.ENG. CIVIL ENGINEERING | 2005 | UNIVERSITY OF HONG KONG**

## Experience

### **SENIOR GEOTECHNICAL ENGINEER | CDM SMITH, INC. | 2006 – PRESENT**

- Manages a large number of projects on subsurface investigation, various trenchless installation method design, shallow and deep foundation design and installation, retaining wall and excavation support system design and installation, geotechnical instrumentation, dewatering and drainage system evaluation, settlement analysis, slope stability evaluation, and geothermal ground source heat pump system design and installation.
- Leads a group of geotechnical engineers, civil designers and drafters on projects in design and construction of various water and wastewater treatment facilities, pipelines, pump stations, storage tanks, various industrial, commercial and school facility development, shoreline protection, tunnels and transportation work.

## Project Experience

**Geotechnical Engineer, Water Transmission Main, Village of Oak Lawn, Illinois.** Coordinated and reviewed the geotechnical and geophysical investigation programs, conducted evaluation and design, including alternative evaluation for various trenchless installation alignments and options, and prepared geotechnical-related design and contract documents and GBRs for the 17 miles new water transmission main to address the current system deficiencies and provide additional capacity and redundancy for the Village of Oak Lawn and its twelve customer communities. The new 60-in steel transmission main includes a number of trenchless crossings through roadways, railroads, wetland and waterways, rock tunnel under Calumet-Sag Chanel, several 84-in diameter pipe jacking and microtunnels, and a 2400 feet long HDD section.

**Geotechnical Engineer, Central Lake County Joint Action Water Agency North and West Group Water System Expansion, Lake County, Illinois.** Planned and reviewed the multi-phase geotechnical investigation programs, coordinated geotechnical design effort and prepared various contract documents for the different bid packages, which involves a total of approximately 22 miles of 10 to 24 inch-piping and a number of delivery structures to extend the Agency's water transmission pipeline system to several new communities. Due to various restrictions, over 40 trenchless crossings range from about 50 feet to 1650 feet are designed to be installed using jack and bore, pipe jacking or horizontal directional drilling. Ms. Chan supported the bidding and construction services of various bid packages in the project, including preparation of railroad crossing permit.

**Geotechnical Engineer, Narragansett Bay Commission Seekonk River Combined Sewer Overflow Interceptor, Providence, Rhode Island.** Served as the geotechnical engineer for the final design of the 7300 feet long 48- to 60-inch combined sewer overflow (CSO) interceptor, with about 5000 feet of the interceptor to be constructed by microtunneling and pipe jacking, and the rest with deep trench excavation. Ms. Chan designed the foundations of the pipeline and structures, which included both geogrid-reinforced subgrade and micro-piles supported structures, and provided recommendations for trenchless installation, and construction issues.

**Geotechnical Engineer, Loudoun Water Potomac Water Supply Program (PWSP) Phase 1, Loudoun County, Virginia.** Coordinated the geotechnical and geophysical investigation programs, conducted and coordinated the design effort, and prepared various geotechnical reports and design documents for the new multi-phase 20MGD water treatment facility with finished water transmission main and other utilities extending into nearby community several thousand feet away. As part of the project, massive earthwork, rock excavation, as well as a rock tunnel crossing under Goose Creek and four trenchless crossings under state highways are needed. Ms. Chan also led the geotechnical support for bidding and construction services, including change order review, full-time tunnel inspection and assistance in evaluating material reuse.

**Geotechnical Engineer, Metropolitan District Folly Brook Trunk Sewer, Wethersfield, Connecticut.** Coordinated the geotechnical and geophysical investigation programs, conducted and coordinated the evaluation and design effort, and prepared various geotechnical reports and design documents for the new 5000 feet long, 36-inch diameter reinforced concrete trunk sewer along two major roadways. Due to variation in topography and the subsurface condition, about 2700 feet of the trunk sewer is to be installed in a 72-inch diameter tunnel that is mostly in rock with a transition from glacial till.

**Lead Geotechnical Engineer, Marginal Sewer Relief Pipe and LRTA Drainage Improvements, Lowell Regional Wastewater Utility, Lowell, MA.** Coordinated the geotechnical investigation program, conducted geotechnical design and prepared various contract documents for the conversion of an open channel to a 60-inch diameter RCP conduit under a future depot, as well as the installation of 24-inch diameter RCP gravity pipe within a university parking lot with sensitive project schedule and a 127-foot long pipe jacking across active MBTA railroad tracks. Provided construction services and supervision of the pipe jacking operation inspection.

**Geotechnical Engineer, Storm Sewer for CSO 016 and Contract 5 Caisson Abandonment, Dearborn, MI.** Led the geotechnical design of multiple projects under the CSO-16 Sewer Separation program, including the closure of a 79-foot diameter, cracked and tilted overflow capture caisson structure that extended 85 feet deep, various trenchless installations of storm and sanitary sewer pipes, installation of pile-supported 144-in diameter storm sewers, soil-supported 72 to 108-in diameter combine sewer pipe, associated structures and various pipelines in very soft clay. Prepared various geotechnical reports and contract documents, including various settlement, excavation support and trenchless design evaluations. She also reviewed the alternative design by contractor and provided support during construction.

**Geotechnical Engineer, N-9/N-10/N-12 CSO Elimination and Replacement of New North Branch Interceptor, The Metropolitan District (MDC), Hartford, Connecticut.** Led the geotechnical engineering evaluation and supported the alternative evaluation effort for the installation of 36 to 84-inch diameter combined sewer pipe and associated structures. Conducted alternative alignments evaluation, which included evaluation of various pipe jacking for river crossing, 96-inch diameter microtunneling alignment alternative, excavation support evaluations and pipeline support in soft Connecticut Valley varved clay.

**Geotechnical Engineer, Tunnel Dewatering Pump Station & Enhanced Clarification Facility, DC Water Blue Plains Advanced Wastewater Treatment Plant, Washington DC.** The design-built project for the TDPS & ECF included various deep-foundation-supported buildings, tanks and pump stations, as well as pump station structures inside a tunnel dewatering shaft that is over 180 feet deep, with a large number of yard piping up to 96-inch diameter. Ms. Chan coordinated the design of the foundation system of various structures and pipelines, including a multi-phase pile optimization evaluation that saved over ten thousand feet of piles for the project. She also leads the geotechnical effort for construction support, which included large-scale excavation support systems, load testing and installation of over six hundreds auger cast piles.

**Geotechnical Engineer, NYCDEP Flushing Bay High Level Interceptor Improvements, Queens, New York.**

Performed geotechnical engineering evaluation and foundation design for the modifications to five regulators located under busy streets of Queens, NY. Traffic control, site access restriction, overhead constraints, existing utilities and structures protection and limited construction work hours are some of the additional challenges. The design included auger-cast-in-place piles, drilled shafts, micro-piles, shallow foundation, secant pile walls and multi-level braced sheetpiling, and complex construction sequencing. She also prepared geotechnical report and contract documents, and led the construction services and geotechnical construction oversight efforts.

**Geotechnical Engineer, Harbor Siphon Tunnel and Shaft, New York, New York.** The project consists of the design and construction of a new 1.75 mile long, 72-inch diameter pipeline between Brooklyn and Staten Island. The pipeline was constructed inside a 12 foot diameter tunnel in various soil conditions (marine clay, glacial till, bedrock, fill) with over 100 feet deep shafts on both sides. The project also includes a couple of trenchless crossings under railroad tracks and micropile supported pipeline and structures. The subsurface investigation consisted of extensive land and marine borings, in-situ testing, laboratory testing and geophysical study.

**Geotechnical Engineer, Water Storage Replacement, Evanston, Illinois.** Due to aging and structural deficiency, the existing 5MG cast-in-place underground concrete clearwell located within Northwestern University campus is to be replaced in kind at the same location. The new and existing clearwell not only founded on soft clay, but also extend deep below grade and into the zone of influence of the shallowly founded dormitories and sensitive utilities that are in extremely close proximity to clearwell. Significant effort in coordination between different stakeholders and design of a complex excavation support system that interconnected with phased demolition of existing clearwell and construction of the new structure is required.

**Geotechnical Engineer, NYCDEP Office of Green Infrastructure, Right-Of-Way-Bioswales, Flushing Bay BB-08 Contract Area 3 project, Queens, New York and Newtown Creek project, Brooklyn, New York.** Planned, coordinated, and supervised the geotechnical investigation programs for soil borings and in-situ permeability testing for about 1000 preliminary right-of-way bioswales, greenstreet and public property retrofit sites in Queens and over 300 similar sites in Brooklyn, New York. The massive drilling programs included over 900 permeability testing locations and over 600 test borings in total. She coordinated the permeability evaluation and reporting, massive program and data management, design and contract drawing production.

**Lead Geotechnical Engineer, King Open and Cambridge Street Upper Schools and Community Complex Project, Cambridge, Massachusetts.** Served as the lead geotechnical engineer for the geotechnical and geothermal design for the demolition and construction a new schools, public library and pool complex located at the highly urban project site. This new complex is set to be designed for Net Zero energy and Net Zero emission with solar panels covering all available roof space and geothermal ground source heat exchanger supplying all heating, cooling and domestic hot water supply. Ms. Chan managed the two-phase geotechnical and analytical subsurface investigation programs, the two geothermal test wells installation and thermal conductivity testing program, all conducted while students were still occupying the school. Working with the design team, Ms. Chan led the geothermal well field design and preparation of contract documents, which included 190 geothermal wells, each 500-ft deep, with over ten thousand feet of horizontal piping, and five vaults for manifolds.

**Lead Geotechnical Engineer, Various Water and Wastewater Treatment Plants and Pipeline Projects.** Led the subsurface investigations, provided geotechnical recommendations, prepared geotechnical reports and contact documents, and provided construction services for various treatment facility and pipeline projects, including those in numerous towns and cities in Massachusetts, Connecticut, Rhode Island, Maine, New York, Virginia, Maryland, Florida, Illinois, and Minnesota.

**MWRA  
POSITION DESCRIPTION**

**POSITION:** Manager, Geotechnical and Tunneling

**DIVISION:** Tunnel Redundancy

**DEPARTMENT:** Tunnel Redundancy

**BASIC PURPOSE:**

Manages activities relative to subsurface investigations, geotechnical, and tunnel engineering. Additionally, manages engineering and design projects related to the Tunnel Redundancy Program as well as rehabilitation and capital improvement of other water and wastewater facilities and infrastructure.

**SUPERVISION RECEIVED:**

Works under the general supervision of the Director, Design and Construction (Tunnel Redundancy.)

**SUPERVISION EXERCISED:**

Manages professional and technical employees and consultants.

**ESSENTIAL DUTIES AND RESPONSIBILITIES:**

- Supervises professional multi-disciplinary engineering work of large and complex projects requiring application of professional engineering principles and the exercise of independent engineering judgment.
- Oversees projects, including the planning and design of the Tunnel Redundancy Program as well as rehabilitation and capital engineering projects for waterworks and wastewater facilities and pipelines. Manages the planning and design phases of the Tunnel Redundancy Program as well as assigned water and wastewater engineering and or maintenance projects including, feasibility and environmental impact reports, detailed plans and specifications, permitting, project schedules, technical assistance, progress review and evaluation.
- Serves as the chief geotechnical/tunneling engineer during the planning, design and construction of the tunnel systems related to the Tunnel Redundancy Program. Develops concept designs and/or reviews designs received from consultant engineering firms.
- Manages activities and interactions related to subsurface investigations and geotechnical engineering. Manages geotechnical engineering reviews and in-house geotechnical design



activities for projects Authority-wide.

- Establishes and reviews policies, procedures, work plans, and schedules for conducting subsurface investigations and inspections, geotechnical engineering reviews and records management of subsurface/geologic data and materials.
- Participates in consultant selection procedures and contract negotiations for projects. Additionally, oversees applicable phases of consultant selection for assigned projects including developing scope of services, specifications, cost estimates, work schedules, negotiations, and preparing contract award recommendations. Ensures compliance with contract budgets, schedules, and terms.
- Coordinates project development and reviews work of professional engineering consultants related to geotechnical and tunnel engineering including subsurface exploration and testing methods, tunnel alignment, shaft location selection, shaft design, tunnel diameter and liner system, tunnel boring machine specification, shaft and tunnel groundwater control, probing and grouting, blasting, ground monitoring, and instrumentation.
- Oversees the work of professional engineering consultants for large tunneling projects, including all work products for quality of work, budget, schedule, and compliance with contractual terms and MWRA objectives and policies. Monitors the professional engineering consultants' efforts to identify and mitigate potential sources of project delays during the construction phase. Provides quality reviews of geotechnical data reports and geotechnical baseline reports as well as contract documents (plans and specifications) for shaft and tunnel projects.
- Coordinates with the Director of Environmental and Regulatory Affairs and Law Division as needed to conduct project activities in compliance with local, state, and federal requirements.
- Supports annual and supplementary budget requests for the Tunnel Redundancy Program in the Capital Improvement Program. Oversees and reviews projects' budgets and schedules for compliance with established department, division, and MWRA program goals.
- Prepares and reviews project schedules and budgets, and reviews and recommends payment of invoices.
- Reviews project change orders and cost estimates and identifies new project funding requirements.
- Manages subsurface data records, records access, and exchange of technical information.
- Assists with the development of risk management plans and quality plans for tunneling projects and participates in overseeing their implementation.
- Manages professional staff, including assigning projects, evaluating performance, and planning staff development. Provides technical and administrative assistance to staff in the development and management of projects which include design and engineering services

during construction in the Tunnel Redundancy Program as well as new and rehabilitative water and wastewater projects. Develops safety procedures working closely with MWRA Safety staff.

- Works effectively and in conjunction with other MWRA divisions and departments to ensure complete and coordinated projects. Coordinates projects with communities, government agencies and other MWRA departments as required. Provides technical information and assistance. Addresses professional and community groups and initiates outreach projects as required.
- Assists with compliance with MWRA procedures and policies, regulatory requirements and applicable engineering standards. Ensures all project activities are coordinated with MWRA divisions and departments, outside regulatory and permitting agencies and communities, as appropriate.
- Assists in implementing the goals and commitments of MWRA in the areas of customer services, diversity and affirmative action, economy and efficiency, health and safety, emergency response and security, integrity, and public trust.

**SECONDARY DUTIES:**

- Performs related duties as required.

**MINIMUM QUALIFICATIONS:**

Education and Experience:

- (A) A bachelor's degree in geotechnical engineering, geology, or civil engineering or related engineering field; and
- (B) A master's degree in geotechnical or tunnel engineering, or civil engineering with a geotechnical focus; and
- (C) At least ten (10) years of civil/geotechnical/tunnel engineering experience; and
- (D) At least five (5) years of progressive engineering experience in shaft and tunnel design involving sewer or water system tunnel projects; and
- (E) At least three (3) years' experience in a supervisory or project management capacity; or
- (F) Any equivalent combination of education and experience.
- (G) Preferred qualifications: Previous design or construction experience on a megaproject(s) (i.e., projects over \$1B).

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of principles and practices of civil engineering, geotechnical, and tunneling engineering.
- (B) Understanding of issues related to design, construction, and operation of large and complex water and wastewater facilities and infrastructure.
- (C) Demonstrated ability to work effectively as part of a collaborative project team and also to function independently with minimal supervision.
- (D) Knowledge of Massachusetts bidding laws, including M.G.L Chapter 30 and Chapter 149 construction bidding regulations.
- (E) Knowledge of environmental regulations and permitting requirements.
- (F) Proficiency with computer software such as Microsoft Office Suite.
- (G) Familiarity with engineering software such as CADD related to subsurface investigations, geotechnical engineer, shaft, and tunnel design.
- (H) Excellent interpersonal, managerial, written and oral communications skills.
- (I) Well-developed management skills including effective delegation of work and performance management.
- (J) Ability to provide program management leadership to engineering managers and staff engaged in engineering programs, projects and activities.

**SPECIAL REQUIREMENTS:**

A valid Massachusetts Class D Motor Vehicle Operators License.

Registration as a Massachusetts Professional Engineer.

**TOOLS AND EQUIPMENT USED:**

Office machines as normally associated with the use of telephone, personal computer, including word processing and other software, copy fax machine, measuring equipment, light tools and mobile radio.

**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 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 stand, walk, climb or balance, stoop, kneel, crouch, or crawl, taste or smell.

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

### **WORK ENVIRONMENT:**

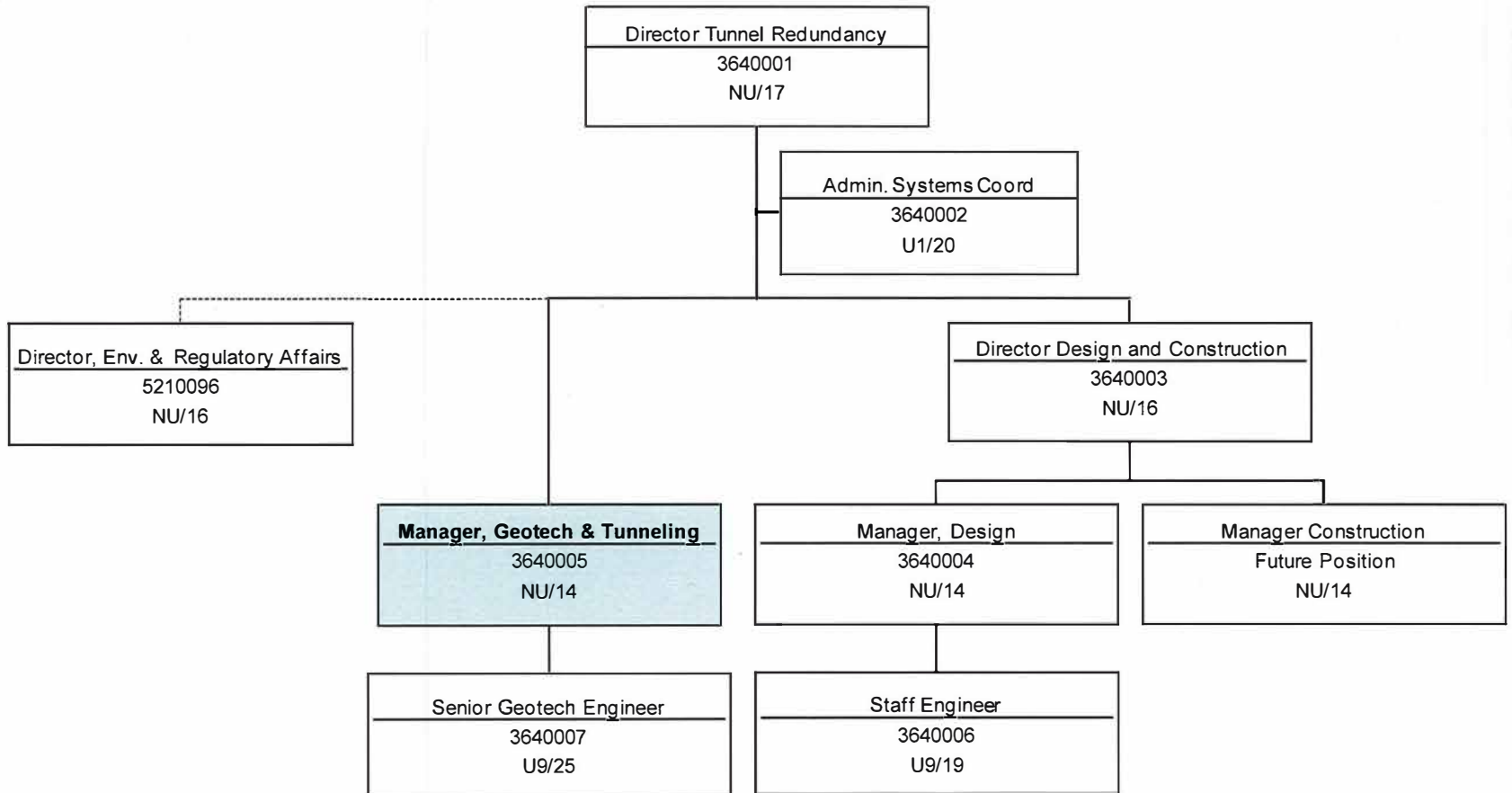
The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job.

While performing the duties of this job, the employee occasionally works in outside weather conditions. The employee occasionally works near moving mechanical parts, and is occasionally exposed to wet and/or humid conditions and vibration. The employee occasionally works in high or underground precarious places and is occasionally exposed to fumes or airborne particles, toxic or caustic chemicals and risk of electrical shock.

The noise level in the work environment is usually loud in field setting and moderately quiet in an office setting.

**June 2018**

**Tunnel Redundancy Division**  
December 2018





# 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, December 19, 2018

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

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

Time: Immediately following Personnel Committee

### **AGENDA**

#### **A. Information**

1. Delegated Authority Report – October 2018
2. Recent Inquiries Regarding Sewer System Expansion
3. Change Order Requests on Active Construction Contracts
4. FY2019 Financial Update and Summary as of November 2018

#### **B. Approvals**

1. Transmittal of the FY2020 Proposed Capital Improvement Program to the MWRA Advisory Board

#### **C. Contract Awards**

1. Security Guard Services for Various MWRA Facilities: Universal Protection Services LLC, d/b/a Allied Universal Services, Contract EXE-041

#### **D. Contract Amendments/Change Orders**

1. Managed Security Services: NWN Corporation, Contract 7499, Amendment 1

## **MASSACHUSETTS WATER RESOURCES AUTHORITY**

### Meeting of the

### Administration, Finance and Audit Committee

November 14, 2018

A meeting of the Administration, Finance and Audit Committee was held on November 14, 2018 at the Authority headquarters in Charlestown. Committee Chair Vitale presided. Present from the Board were Ms. Wolowicz and Messrs. Carroll, Cotter, Flanagan, Foti, Pappastergion, Peña and Walsh. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, Thomas Durkin, Michele Gillen, Brian Rozowsky, Godfrey Ezeigwe, Cheryl King, Stephen Estes-Smargiassi, Douglas Rice, Kathy Soni, Matthew Horan, Sean Cordy, Michael McDonald, Denise Breiteneicher, Russell Murray, Paula Weadick and Kristin MacDougall. The meeting was called to order at 11:19 a.m.

### **Information**

#### Internal Audit Department Activities Report – FY2018

Staff provided a verbal update on activities for FY2018. (Ms. Wolowicz temporarily left the meeting during the presentation.) There was discussion and questions and answers.

#### FY2019 First Quarter Orange Notebook

Staff made a presentation on key management indicators for the First Quarter of FY2019. (Mr. Pappastergion and Mr. Peña temporarily left the meeting and returned during the presentation.) (Ms. Wolowicz returned during the presentation.) There was discussion and questions and answers.

#### Delegated Authority Report – October 2018

Staff provided a verbal update on delegated authority actions taken in October 2018. There was general discussion and questions and answers.

---

\* Committee recommendation approved by the Board on November 14, 2018

FY19 Financial Update and Summary as of October 2018

Staff provided a verbal update on FY2019 financial results and variance highlights through October 2018. There was general discussion and questions and answers.

**Approvals**

\* Approval of Seventy-Ninth Supplemental Bond Resolution

Staff made a verbal presentation on the proposed supplemental bond resolution. There was brief discussion and questions and answers.

The Committee recommended approval. (ref. AF&A B.1.)

\* Memoranda of Understanding Between MWRA and Eversource, Eversource Gas Company and Western Massachusetts Electric Company (Northeast Utilities Companies), and National Grid

Staff made a verbal presentation on the scope and benefits of the proposed Memoranda of Understanding. There was brief discussion and questions and answers. (Mr. Foti temporarily left the meeting during discussion.)

The Committee recommended approval. (ref. AF&A B.2.)

**Contract Awards**

Purchase of New Desktop Computers, Imaging and Deployment Services: Hub Technical Services LLC, Bid WRA-4586Q, State Contract #ITC47

Staff made a presentation on the scope of the proposed contract. (Mr. Foti returned to the meeting during the presentation.) There was general discussion and questions and answers.

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

The meeting adjourned at 12:07 p.m.

---

\* Committee recommendation approved by the Board on November 14, 2018



**STAFF SUMMARY**


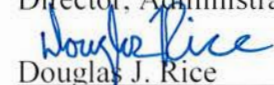
**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director  
**DATE:** December 19, 2018  
**SUBJECT:** Delegated Authority Report – November 2018



COMMITTEE: Administration, Finance & Audit

INFORMATION  
 VOTE

Linda D'Addario, Admin. Systems Coordinator  
Barbara Aylward, Administrator A & F  
Preparer/Title

  
Michele S. Gillen  
Director, Administration  
  
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 November 1 – 30, 2018.

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 NOVEMBER 1 - 30, 2018

NO.	DATE OF AWARD	TITLE AND EXPLANATION	CONTRACT	AMEND/CO	COMPANY	FINANCIAL IMPACT
C-1.	11/02/18	<b>HYDRAULIC EQUIPMENT SERVICE</b> FINAL BALANCING CHANGE ORDER TO DECREASE THE FOLLOWING BID ITEMS TO REFLECT ACTUAL QUANTITIES USED: PREVENTIVE MAINTENANCE SERVICES, NON-EMERGENCY ON-CALL MAINTENANCE SERVICES, REPLACEMENT PARTS AND PRICE ADJUSTMENT ALLOWANCE.	OP-327	1	R. ZOPPO CORP.	(\$80,818.86)
C-2.	11/02/18	<b>HATCHERY PIPELINE AND HYDROELECTRIC PROJECT</b> FURNISH AND INSTALL AN EXPANSION JOINT, THREE PIPE SUPPORTS AND MODIFY THE GENERATOR DRAFT TUBE; WIDEN MACHINE TURBINE RUNNER TO OPEN GAP BETWEEN HOUSING AND RUNNER TO IMPROVE TURBINE RELIABILITY.	7235	5	WATERLINE INDUSTRIES CORP.	\$56,775.03
C-3.	11/02/18	<b>ALEWIFE BROOK PUMP STATION REHABILITATION</b> SERVICES ARE REQUIRED TO DEVELOP NEW ALEWIFE BROOK PUMP STATION SCADA DISPLAY SCREEN IN ACCORDANCE WITH THE RECENTLY ADOPTED NEW STANDARD FOR THE GRAPHICS OF SCADA SYSTEM; INCREASE CONSTRUCTION ADMINISTRATION SERVICES DURING CONSTRUCTION FOR MWRA CONTRACT NO. 6797 - ALEWIFE BROOK PUMP STATION REHABILITATION.	7034	5	STANTEC CONSULTING SERVICES, INC.	\$65,865.02
C-4.	11/07/18	<b>CHELSEA CREEK HEADWORKS UPGRADE</b> FURNISH AND INSTALL CURED-IN-PLACE-PIPE LINER IN EXISTING STORM DRAIN, PERFORM ADDITIONAL TEST PITS AND PROVIDE LICENSED SITE PROFESSIONAL SERVICES.	7161	21	BHD/BEC 2015, A JOINT VENTURE	\$82,621.00
C-5.	11/13/18	<b>LORING ROAD PIPE INSULATION</b> AWARD OF ENERGY EFFICIENCY CONTRACT TO EVERSOURCE PREQUALIFIED VENDOR FOR THE LORING ROAD PIPE INSULATION AT THE LORING ROAD COVERED STORAGE FACILITY FOR A TERM OF 120 CALENDAR DAYS. REBATE TOTALING \$12,593 WILL BE RECEIVED FROM EVERSOURCE UPON PROJECT COMPLETION. MWRA WAS ALSO AWARDED A \$59,566 DEP ENERGY EFFICIENCY GRANT, RESULTING IN A FINAL COST TO MWRA OF \$25,093, FOR A PROJECT PAYBACK PERIOD OF 2.8 YEARS.	OP-378	AWARD	HORIZON SOLUTIONS LLC	\$97,252.00
C-6.	11/15/18	<b>ELEVATOR MAINTENANCE AND REPAIR SERVICE - DEER ISLAND TREATMENT PLANT</b> FINAL BALANCING CHANGE ORDER TO DECREASE THE FOLLOWING BID ITEMS TO REFLECT ACTUAL QUANTITIES USED: SCHEDULED PREVENTIVE MAINTENANCE, ANNUAL INSPECTIONS, TESTING AND REPORTS, ON-CALL MAINTENANCE REPAIR, REPLACEMENT PARTS AND MARK UP.	5535	1	EAGLE ELEVATOR CO., INC.	(\$161,708.64)
C-7.	11/28/18	<b>APPROVAL OF LEASE AMENDMENT FOR WAREHOUSE STORAGE SPACE</b> EXTEND WAREHOUSE AND RECORD STORAGE SPACE LEASE AT 34 ST. MARTIN DRIVE, MARLBOROUGH, MA FOR 20 MONTHS FROM JUNE 1, 2019 TO JANUARY 31, 2021.	6827	5	LPCH MARLBOROUGH DATA, LP "LINCOLN PROPERTIES"	\$169,381.60

## PURCHASING DELEGATED AUTHORITY ITEMS NOVEMBER 1 - 30, 2018

NO.	DATE OF AWARD	TITLE AND EXPLANATION	CONTRACT	AMENDMEN	COMPANY	FINANCIAL IMPACT
P-1	11/02/18	<b>PURCHASE OF TWENTY TELOG R-3314 REMOTE DATA LOGGERS AND MODEMS</b> AWARD OF A SOLE SOURCE PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR 20 TELOG R-3314 REMOTE DATA LOGGERS AND MODEMS			TELOG INSTRUMENTS, INC.	\$44,820.00
P-2	11/02/18	<b>PURCHASE OF HDPE PIPE, FLEX RESTRAINTS AND TECHNICAL SERVICES</b> AWARD OF A SOLE SOURCE PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR HDPE PIPE, FLEX RESTRAINTS AND TECHNICAL SERVICES FOR WATERTOWN SECTION MECHANICAL COUPLING REPAIRS.			ISCO INDUSTRIES, INC.	\$49,606.40
P-3	11/02/18	<b>PURCHASE OF TWO NEW FORD T250 TRANSIT CARGO VANS AND ONE NEW FORD T350 PASSENGER VAN</b> AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR TWO NEW FORD T250 TRANSIT CARGO VANS AND ONE NEW FORD T350 PASSENGER VAN.	WRA-4565		MHQ, INC.	\$132,579.00
P-4	11/07/18	<b>PURCHASE OF 11 4G NETWORK ROUTERS, INSTALLATION SERVICES AND ONE-YEAR MAINTENANCE AND SUPPORT</b> AWARD OF A SOLE SOURCE PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR 11 4G NETWORK ROUTERS, INSTALLATION SERVICES AND ONE-YEAR OF MAINTENANCE AND SUPPORT.			VERIZON BUSINESS NETWORK SERVICES, INC.	\$68,874.89
P-5	11/08/18	<b>PURCHASE OF ONE GATE VALVE TRUCK</b> AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR ONE GATE VALVE TRUCK, AS A REPLACEMENT, FOR THE WATER VALVE CREWS.	WRA-4578		RBG, INC.	\$137,347.00
P-6	11/15/18	<b>PURCHASE OF 94 STATION BATTERIES</b> AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR 94 STATION BATTERIES FOR THE NORTH MAIN PUMP STATION AT THE DEER ISLAND TREATMENT PLANT TO PROVIDE UNINTERRUPTED POWER UNTIL THE EMERGENCY SYSTEM TURNS ON.			GRAYBAR ELECTRIC COMPANY, INC.	\$35,774.52
P-7	11/15/18	<b>PURCHASE OF SPECIAL HAZARD FIRE SUPPRESSION AND DELUGE FIRE SYSTEMS INSPECTIONS</b> AWARD OF A THREE-YEAR PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR SPECIAL HAZARD FIRE SUPPRESSION AND DELUGE FIRE SYSTEMS INSPECTIONS AND SERVICES AT THE DEER ISLAND TREATMENT PLANT.	WRA-4584		ENCORE HOLDINGS, LLC	\$59,425.00
P-8	11/15/18	<b>PURCHASE OF ONE NEW DIESEL POWERED FRONT END LOADER</b> AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR ONE NEW DIESEL POWERED FRONT END LOADER, AS A REPLACEMENT, FOR DEER ISLAND.	WRA-4577		SOUTHWORTH MILTON, INC.	\$143,900.00
P-9	11/19/18	<b>PURCHASE ORDER CONTRACT FOR THE ANALYSIS OF EXTRACTABLE AND VOLATILE PETROLEUM HYDROCARBONS</b> AWARD OF A ONE-YEAR PURCHASE ORDER CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR THE ANALYSIS OF EXTRACTABLE AND VOLATILE PETROLEUM HYDROCARBONS IN WASTEWATER SAMPLES AND TOTAL PETROLEUM HYDROCARBON AND CYANIDE IN BIOSOLIDS SAMPLES.	WRA-4590Q		KATAHDIN ANALYTICAL SERVICES, INC.	\$25,485.00
P-10	11/19/18	<b>PURCHASE OF ONE NEW ELECTRIC HYBRID SEDAN, ELEVEN NEW SPORT UTILITY VEHICLES AND THREE CARGO VANS</b> AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR ONE NEW ELECTRIC HYBRID SEDAN, ELEVEN NEW SPORT UTILITY VEHICLES AND THREE NEW CARGO VANS.	WRA-4566		LIBERTY CHEVROLET COLONIAL FORD, INC.	\$247,165.00 \$267,050.50
P-11	11/19/18	<b>PURCHASE OF FIFTEEN NEW GENERAL MOTORS PICKUP TRUCKS</b> AWARD OF A PURCHASE ORDER CONTRACT TO THE LOWEST RESPONSIVE BIDDER UNDER STATE CONTRACT VEH98 FOR 15 NEW GENERAL MOTORS PICKUP TRUCKS.	WRA-4567		LIBERTY CHEVROLET COLONIAL FORD, INC.	\$433,203.96 \$279,691.85
P-12	11/29/18	<b>PURCHASE OF ONE NEW MOWER TRACTOR AND CUTTER</b> AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR ONE NEW MOWER TRACTOR AND CUTTER FOR GROUNDS MAINTENANCE WEST AS PART OF A GRANT FROM THE RECREATIONAL TRAILS PROGRAM FOR USE ON THE AQUEDUCT TRAILS.	WRA-4607Q		PADULA BROTHERS, INC.	\$35,417.54
P-13	11/29/18	<b>SNOW REMOVAL SERVICES</b> AWARD OF A FIVE-MONTH PURCHASE ORDER CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR SNOW REMOVAL SERVICES FOR THE CLINTON WASTEWATER TREATMENT PLANT.			PARSONS LANDSCAPING, INC.	\$35,000.00
P-14	11/29/18	<b>SUPPLY AND DELIVERY OF ULTRA-LOW-SULFUR #2 DIESEL FUEL</b> AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR THE SUPPLY AND DELIVERY OF 343,000 GALLONS OF ULTRA-LOW-SULFUR #2 DIESEL FUEL FOR THE DEER ISLAND TREATMENT PLANT.	WRA-4600		GLOBAL MONTELLO GROUP CORPORATION	\$718,722.20

## STAFF SUMMARY


**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Recent Inquiries Regarding Sewer System Expansion

---

**COMMITTEE:** Administration, Finance & Audit

X  INFORMATION  
VOTE

Beth Card, Director, Environmental and Regulatory Affairs  
Preparer/Title

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

---

### RECOMMENDATION:

For information only. MWRA has received two requests for consideration by entities seeking to connect to the sewer system. Both project proponents intend to avail themselves of #OP.04, Sewer Connections Serving Property Partially Located in a Non-MWRA Community.

### DISCUSSION:

MWRA Policy #OP.04 applies to persons seeking sewer services for buildings/structures that are located partially within an MWRA sewer community and partially outside an MWRA sewer community (the actual structures, not just the parcel of land on which the structure is located, must straddle the municipal boundary). It is also known as the "Sewer Straddle" policy. If a connection is not eligible under the "Sewer Straddle" policy, then a project proponent would seek admission under #OP.11, Admission of New Community to MWRA Sewer System and Other Requests for Sewer Service to Locations Outside MWRA Sewer Service Area. #OP.11 applies to communities seeking admission to the MWRA sewer system and to all parties seeking sewer service for locations outside the MWRA service area that are not eligible under the "Sewer Straddle" policy. For wastewater connections, MWRA requirements address inflow removal, ongoing stipulations regarding management of wet weather flows, compliance with discharge limits, and entrance payments due to the MWRA. In 2017, there were no applications to MWRA for sewer connections under either #OP.11, *Admission of New Community to MWRA Sewer System and Other Requests for Sewer Service to Locations Outside MWRA Sewer Service Area*, or #OP.4, the "Sewer Straddle" policy.

In October 2018, MWRA received two inquiries about opportunities for sewer connections. Staff continue to engage in fact-finding associated with the two projects and as a result neither are prepared to be considered by either the Board of Directors or Advisory Board. However, given the potential of one or both of these projects to proceed, it is prudent to give the Board of Directors an early view. The two projects are described below.

**Yankee Trader Seafood:** This company, which makes frozen seafood appetizer products is seeking to purchase a building in Hingham. The property, located at 80 Sharp Street in Hingham, has a




failed septic system. The company is looking to connect to the Weymouth wastewater system, utilizing the straddle policy, although she has been advised that OP.11 may be the more appropriate guiding policy. The facility would discharge on average 1,500 gallons per-day, with a peak of 3,000 gallons per-day. While these are relatively low volumes, capacity in Weymouth is limited in wet weather and the Town typically requires 6:1 inflow and infiltration removal. MWRA and Yankee Trader Seafood have both been in communications with the Town of Weymouth. Currently, the Town's wastewater superintendent is reviewing the sewer plans, septic connection and grease trap plans to determine if the connection is allowable. If the Town of Weymouth is willing to accept the additional wastewater into its system, then the MWRA will work Yankee Trader Seafood to consider a recommendation for the MWRA admission process. The wastewater has been described as sanitary waste but considering that it is generated at a food processing facility, MWRA staff will make a determination as to whether additional permits, such as a sewer use discharge permit, will be required along with the other components of our admission policy.

The Rivers School: This is a co-educational, college preparatory day school for students in grades six through 12, located at 333 Winter Street in Weston. The school, which is located on the Weston/Natick town line and has property in both towns, is seeking to discharge wastewater generated at the Weston portion of its campus into the MWRA system. The school has determined that the most sensible place for this connection is via the collection system in Natick. MWRA staff has met with operational staff and a consultant for the school. On average, the school generates approximately 2,500 gallons per day, however the peak day average daily flow, for example when there are large events at the school, is about 14,500 gallons per day. The school has a functioning on-site wastewater treatment system that is a permitted groundwater discharge. However, given the fluctuations in flows when students are in and out of school, they are finding it hard to maintain the system effectively and meet permit requirements during low flow periods. Further, the school has indicated an interest in doing more to protect surface waters in neighboring areas and a sewer connection as opposed to a groundwater discharge would advance that goal. School officials have begun to have conversations with DPW personnel in Natick to evaluate the feasibility of connecting via their system. Conversations have yet to be finalized with other officials in Natick or Weston, so The Rivers School does not yet have formal approval to join the MWRA, as is required by MWRA admission policies.

**BUDGET/FISCAL IMPACT:**

Charges for new sewer connections include: entrance fee, connection charges, and annual use charges. Should either facility formally submit an application with supporting documentation to the MWRA the fees would be calculated at that time.

## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Change Order Requests on Active Construction Contracts

---

**COMMITTEE:** Administration, Finance & Audit

INFORMATION  
 VOTE

John P. Colbert, P.E., Acting Chief Engineer  
Corinne M. Barrett, Director, Construction  
Preparer/Title

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

---

### RECOMMENDATION:

For information only. At the November 14, 2018, Board of Director's meeting, the Board requested information regarding the number of construction contract change order requests that were accepted versus those rejected.

### DISCUSSION:

A Change Order Request is an issue identified by the Contractor as a potential change order, usually based on a Request for Information (RFI) response. Staff and the Designer then evaluate the merit, or lack thereof, of the change order request. This merit analysis may result in a determination of merit, partial merit, or denial of the change order request.

A determination of merit or partial merit results in a written response to the Contractor indicating that MWRA will initiate a change order. The change order is drafted by MWRA containing the scope of work, a narrative justification with the reason for the change order, along with other pertinent information, such as a rough order of magnitude of cost and schedule impacts. In accordance with the MWRA's Change Order Policy and Procedures, there are eight possible reasons and/or categories that are acceptable for the issuance of a change order: 1) actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown in the contract documents; 2) MWRA ordered suspension of the work; 3) change in site conditions; 4) unforeseen conditions; 5) design error, omission or change; 6) reduction in the scope of work; 7) overrun/underrun in quantities; and 8) schedule changes. The change order is reviewed by Construction & Engineering management, and Procurement prior to being approved.

Category 5 change orders that are design errors or omissions are reviewed during or at completion of a construction contract by a Consultant Performance Review Committee that includes staff from Engineering & Construction, Procurement, and Law Division. The committee assesses the performance of design engineering firms, and where appropriate, seeks recovery of costs that have been incurred by the MWRA, as a result of deficient designer performance.

The Executive Director's change order delegated authority approval is \$250,000, or 25% of the original contract price, whichever is less, and up to 180 days for a time extension. Change orders above the delegated limit require approval of the Board of Directors.

The attached Table 1, Change Order Requests for Active Construction Contracts provides detailed information for each of the 34 construction contracts that have been active since FY18.

A summary of the total number of change order requests on the 34 construction contracts is provided below:

- 845 change order requests received;
- 644 change order requests with merit;
- 142 change order requests denied;
- 44 change order requests with partial merit/partial denial; and
- 15 change order requests currently under review.

Overall, 76% of the total number of change order requests have been determined to have merit, 17% have been denied, 5% have partial merit, and 2% are still under review.

A significant portion of these change order requests with merit have been included in executed change orders. The remaining requests with merit are either in the approval process, are still under negotiation for the final costs, or are awaiting cost proposals from the contractor. A small number of very recent requests are currently under review and the determination of merit has not yet been completed.

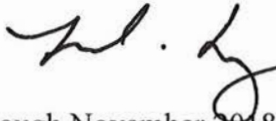
**ATTACHMENTS:**

Table 1, Change Order Requests for Active Construction Contracts



		TABLE 1 - CHANGE ORDER REQUESTS FOR ACTIVE CONSTRUCTION CONTRACTS								11/29/2018	
CONTRACT #	CONTRACT TITLE	BID AMOUNT	TOTAL CORs	ACCEPTED	%	PARTIAL ACCEPTANCE		DENIED	%	UNDER REVIEW	%
S551	Thermal HydroPower Plant Maint.	\$ 4,207,464	4	3	75%	0	0%	1	25%	0	0%
S555	Wind Turbine Maintenance	\$ 365,300	2	2	100%	0	0%	0	0%	0	0%
S566	DITP Wind Turbine Demo	\$ 320,000	0	0	0%	0	0%	0	0%	0	0%
6454	SEH Sect. 111 Boston	\$ 11,770,000	14	11	79%	0	0%	3	21%	0	0%
6650B	Marlboro Maint. Facility	\$ 3,367,000	69	60	87%	0	0%	9	13%	0	0%
6797	Alewife PS Rehab	\$ 12,560,000	31	26	84%	0	0%	5	16%	0	0%
6875	WTF VFD and Motor Replacements	\$ 11,945,000	2	0	0%	0	0%	2	100%	0	0%
6957	Section 14 Malden	\$ 1,404,500	14	13	93%	1	7%	0	0%	0	0%
7022	Cosgrove Roof Replacement	\$ 876,000	0	0	0%	0	0%	0	0%	0	0%
7061A	DITP TPP Fuel Oil Upgrade	\$ 4,550,000	8	7	88%	0	0%	1	13%	0	0%
7067	NIH Sect. 110 Stoneham	\$ 22,737,300	13	9	69%	0	0%	1	8%	3	23%
7085G	JJCWTP Liquid Oxygen Storage Roof	\$ 328,500	14	13	93%	0	0%	1	7%	0	0%
7157	Wachusett Aqueduct Pump Station	\$ 47,011,000	239	180	75%	0	0%	59	25%	0	0%
7161	Chelsea Creek Headworks Upgrade	\$ 72,859,000	265	183	69%	41	15%	36	14%	5	2%
7164	Reading Extension Sewer	\$ 2,048,945	0	0	0%	0	0%	0	0%	0	0%
7168	Personnel Dock Rehab	\$ 1,294,524	3	2	67%	0	0%	1	33%	0	0%
7235	Fish Hatchery Pipeline/Brutch Hydro	\$ 3,657,677	15	14	93%	0	0%	1	7%	0	0%
7275	Valve and Pipe Replacement DITP	\$ 16,960,425	11	9	82%	0	0%	2	18%	0	0%
7361	DeLauri Pump Station Upgrades	\$ 1,330,000	1	1	100%	0	0%	0	0%	0	0%
7382	Chestnut Hill Gatehouse #1	\$ 781,500	4	4	100%	0	0%	0	0%	0	0%
7411	Clinton WWTP Phosphorus Reduction Facility	\$ 7,272,432	46	36	78%	2	4%	8	17%	0	0%
7428	Gravity Thickener Rehabilitation	\$ 19,633,050	4	1	25%	0	0%	0	0%	3	75%
7471	NIH Sect. 110 Reading/Woburn	\$ 9,888,000	43	36	84%	0	0%	7	16%	0	0%
7478	NIH Sect. 110 & 112 Stoneham/Wakefield	\$ 17,817,999	17	15	88%	0	0%	2	12%	0	0%
7488	CVA Intake Screen Replacement	\$ 1,049,000	4	3	75%	0	0%	1	25%	0	0%
7504	SEH Sect. 111 Dedham North	\$ 17,226,350	13	8	62%	0	0%	1	8%	4	31%
7505	SEH Sect. 111 Dedham South	\$ 19,375,000	0	0	0%	0	0%	0	0%	0	0%
7532	Section 80 Pipeline	\$ 1,828,409	1	1	100%	0	0%	0	0%	0	0%
7534	Quincy/Hingham Fuel Storage	\$ 528,888	1	1	100%	0	0%	0	0%	0	0%
7536	General Edwards Bridge River Crossing Demo	\$ 1,898,500	0	0	0%	0	0%	0	0%	0	0%
7634	Bellevue 2/Turkey Hill Water Tank Painting	\$ 3,962,463	0	0	0%	0	0%	0	0%	0	0%
OP-336	Headworks Duct Cleaning	\$ 773,000	4	4	100%	0	0%	0	0%	0	0%
OP-344	Nut Island HVAC Insulation	\$ 82,058	1	0	0%	0	0%	1	100%	0	0%
OP-347	Braintree/Weymouth IPS & Chelsea Adm HVAC	\$ 556,000	2	2	100%	0	0%	0	0%	0	0%
OP-358	Phase B Sewer Manhole Rehab	\$ 328,585	0	0	0%	0	0%	0	0%	0	0%
<b>TOTAL</b>		<b>\$ 322,593,869</b>	<b>845</b>	<b>644</b>	<b>76%</b>	<b>44</b>	<b>5%</b>	<b>142</b>	<b>17%</b>	<b>15</b>	<b>2%</b>

## STAFF SUMMARY


**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** FY19 Financial Update and Summary Through November 2018

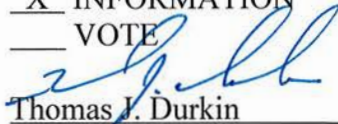
---

**COMMITTEE:** Administration, Finance & Audit

INFORMATION  
 VOTE

Michael Cole, Budget Manager

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 through November 2018, comparing actual spending to the budget.

### DISCUSSION:

The total Year-to-Date variance for the FY19 CEB is \$8.3 million, due to lower direct expenses of \$3.1 million, indirect expenses of \$605,000, and debt service costs of \$3.4 million; and higher revenue of \$1.3 million.

### FY19 Current Expense Budget

The CEB expense variances through November 2018 by major budget category were:

- Net Lower Direct Expenses of \$3.1 million, or 3.2% under budget. Spending was lower for Wages & Salaries, Maintenance, Professional Services, Fringe Benefits, Other Materials, and Utilities. This is offset by higher spending on Overtime, Other Services, Chemicals, Training & Meetings, and Worker's Compensation.
- Lower Indirect Expenses of \$605,000, or 2.9%, due to lower expenses for the low voltage switchgear upgrades related to the HEEC cable, lower claim spending for Insurance, and lower Watershed reimbursements due to a FY2018 year-end over accrual.
- Lower Debt spending of \$3.4 million, or 1.7% due to favorable short-term interest rates, and favorable impact of lower than estimated borrowing cost for the State Revolving Fund.

**FY19 Budget and FY19 Actual Year-to-Date Variance by Expenditure Category**  
(in millions)

	FY19 Budget YTD	FY19 Actual YTD	\$ Variance	% Variance
Direct Expenses	\$97.3	\$94.2	-\$3.1	-3.2%
Indirect Expenses	\$21.1	\$20.5	-\$0.6	-2.9%
Capital Financing	\$196.4	\$193.0	-\$3.4	-1.7%
<b>Total</b>	<b>\$314.8</b>	<b>\$307.8</b>	<b>-\$7.0</b>	<b>-2.2%</b>

*Totals may not add due to rounding*

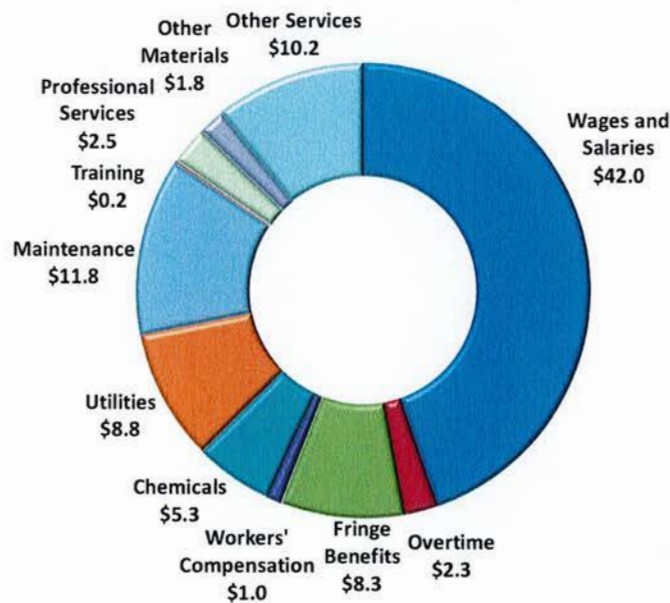
Total Revenues of \$327.3 million were \$1.3 million, or 0.4% over budget. The majority of the variance is pertaining to the favorable short-term rates for investment income.

*Please refer to Attachment 1 for a more detailed comparison by line item of the budget variances for the year-to-date.*

**Direct Expenses**

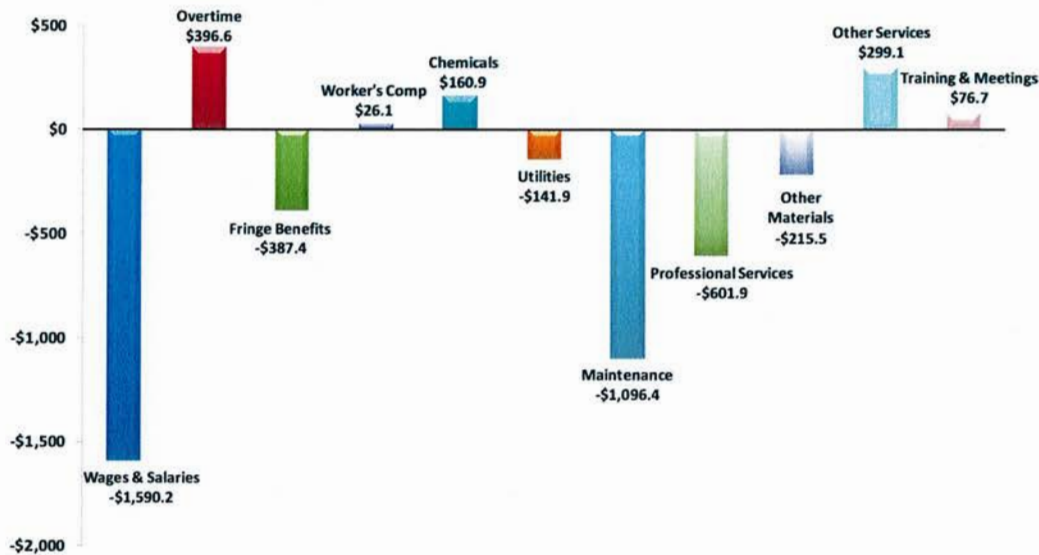
Year-to-date direct expenses totaled \$94.2 million, which was \$3.1 million or 3.2% less than budgeted.

**FY19 Year-to-Date Direct Expenses**  
(in millions)



Lower than budgeted spending for Wages & Salaries, Maintenance, Professional Services, Fringe Benefits, Other Materials, and Utilities; was partially offset by higher spending for Overtime, Other Services, Chemicals, Training and Meetings and Worker's Compensation.

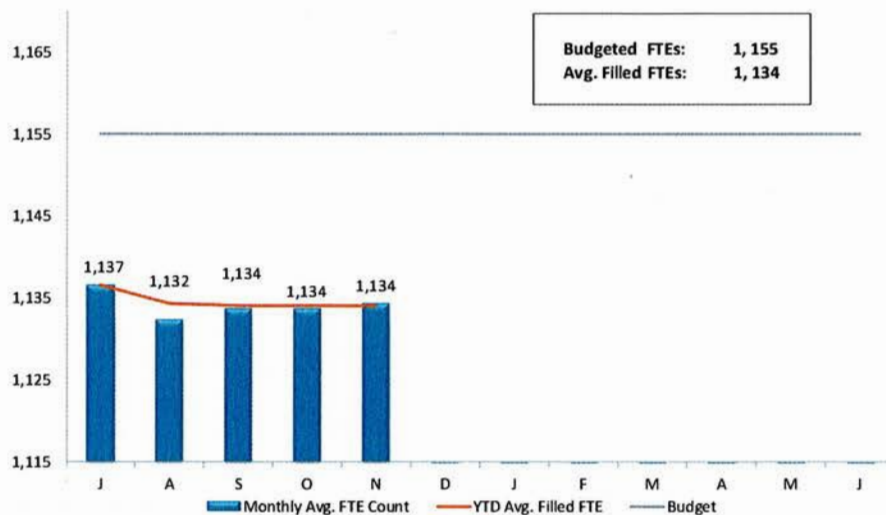
**FY19 Year-to-Date Direct Expense Variance  
(in thousands)**



### Wages and Salaries

Wages and Salaries are under budget by \$1.6 million, or 3.6%. Year to date, there have been 21 fewer average FTEs (1,134 versus 1,155 budget), lower average new hire salaries versus retirees' as well as the timing of backfilling vacant positions, and lower leave balance accruals contributed to Regular Pay being under budget.

**FY19 MWRA Full Time Equivalent (FTE) Position Trend**



## **Maintenance**

Maintenance was under budget by \$1.1 million or 8.5%. While there were numerous components to the underspending for Maintenance year-to-date, the biggest driver was the timing of boiler/steam turbine generator (STG) work at DITP, which was planned for October and November but was not started until December.

## **Professional Services**

Professional Services were under budget by \$602,000 or 19.2%. The overall underspending year-to-date is due to Engineering Services in Operations related to the timing of the Dam Asset Maintenance Plan contract; Other Professional Services in Human Resources, Finance, and Law; and Legal Services in Law and Human Resources.

## **Fringe Benefits**

Fringe Benefit spending was lower than budget by \$387,000 or 4.5%. This is primarily driven by lower Health Insurance costs of \$375,000 (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 \$215,000 or 10.8%, largely driven by the timing of purchases related to Computer Hardware and Equipment/Furniture. The PC replacement project was planned to have begun in November. This is offset by overspending for Lab and Testing Supplies in Department of Lab Services.

## **Utilities**

Utilities were underspent by \$142,000 or 1.7%. Diesel fuel underspending was \$578,000 due to the timing of deliveries at Deer Island, which started in December. This is offset by overspending in Wastewater Operations due to the timing of diesel fuel deliveries, as well as Electricity overspending of \$443,000 for primarily Deer Island and Field Operations.

## **Overtime**

Overtime expenses were higher than budget by \$397,000, or 20.9%. The over spending for the fiscal year was mainly in Wastewater Operations due to the wet weather events.

## **Other Services**

Other Services were over budget by \$299,000 or 3.0%. The main area of over spending was for Sludge Pelletization (\$495,000) due to higher year-to-date quantities. This overage was offset by lower spending in Other Services (\$116,000) for a number of services and includes the timing of Technical Assistance for Lead issues, the timing of remediation projects managed by Real Property/Environmental Management, and Telephones (telephone and data lines in MIS and FOD).

## **Chemicals**

Chemicals were higher than budget by \$161,000 or 3.2%. The majority of the variance for Chemicals was the result of higher Activated Carbon at Nut Island Headworks and Braintree/Weymouth Intermediate Pump Station; higher Sodium Hypochlorite usage at Carroll Water Treatment Plant due to higher usage of Wachusett Reservoir water versus the higher quality water from Quabbin Reservoir, which required higher dosages to disinfect the water, and higher usage at Deer Island and Wastewater Ops due to wet weather; higher Sodium Bisulfite usage at Deer Island and in Wastewater Ops. This is offset by lower spending for Soda Ash at Carroll Water Treatment Plant and lower Hydrogen Peroxide at Deer Island. Through November, Deer Island flows are 0.5% greater than the budget and the Carroll Plant flows are 3% less than budgeted.

## **Training & Meetings**

Training & Meetings expenses were higher than budgeted by \$77,000 or 57.4%, due timing of use/reimbursement within the Operations and MIS departments.

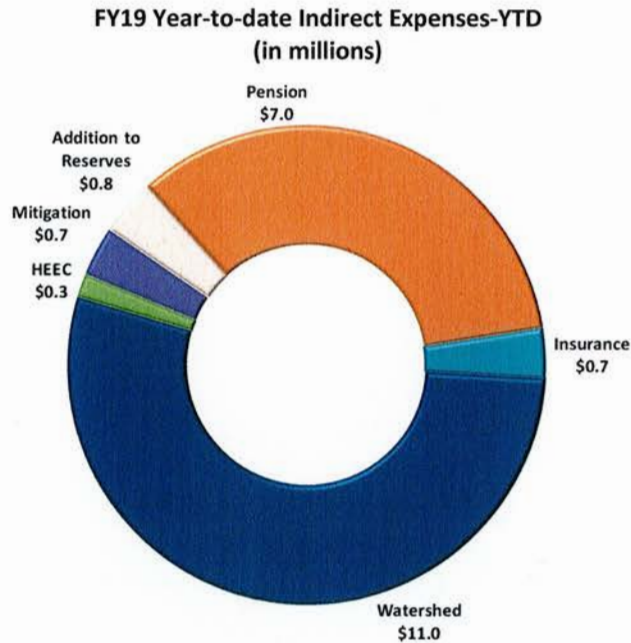
## **Worker's Compensation**

Worker's Compensation expenses were higher than budget by \$26,000 or 2.6%. The higher expenses were primarily due to higher compensation payments and net reserves changes (\$211,000), which are offset by lower medical payments and net reserve changes (\$143,000) and administrative expenses of (\$42,000).



## Indirect Expenses

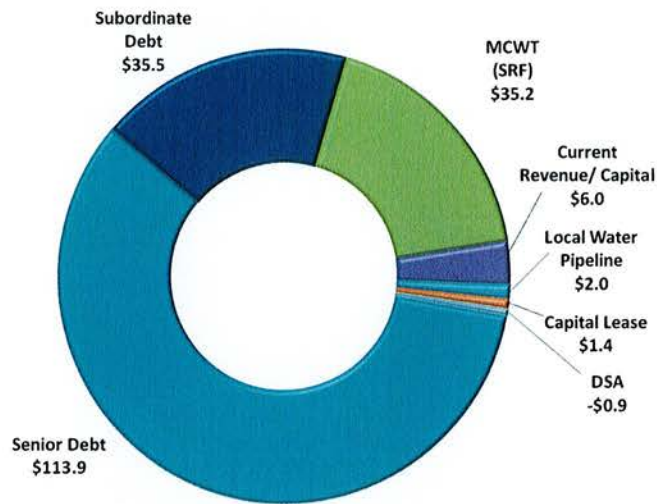
Year-to-date Indirect Expenses totaled \$20.5 million, which is \$605,000 or 2.9% under budget. There are variances within the lines that comprise Indirect Expenses, including lower HEEC cable costs, Insurance costs, and Watershed costs. HEEC charges are under budget by \$256,000 for the low voltage switchgear upgrades. Insurance costs are lower than budget by \$195,000 due to lower claims (\$164,000) and lower premiums (\$32,000). Watershed costs are lower than budget by \$154,000 due to an over-accrual at the end of FY18 on Watershed operating expenses.



## 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.

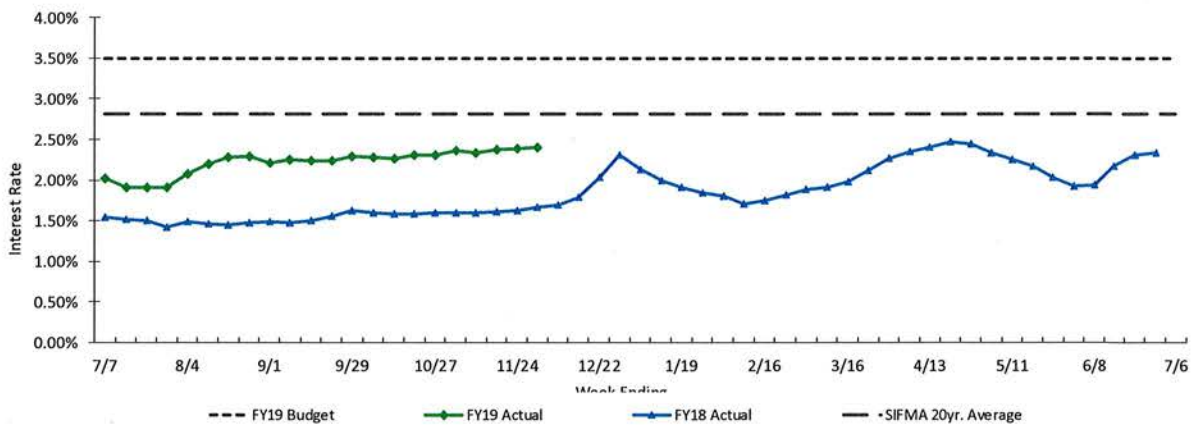
**Year-to-date FY19 Capital Finance  
(in millions)**



Year-to-date Capital Financing expenses for FY19 totaled \$193.0 million, which was under budget by \$3.4 million or 1.7%. The variance is primarily attributed to favorable short-term variable rates.

The graph below reflects the FY19 actual variable rate trend by week year-to-date against the FY19 Budget.

**Weekly Average Interest Rate on MWRA Variable Rate Debt  
(Includes liquidity support and remarketing fees)**





## **Revenue & Income**

Year-to-date Revenues of \$327.3 million were over budget by \$1.3 million or 0.4%. Investment income was over budget by \$805,000 due to favorable returns on investment income (average short-term rates were higher than budgeted: 2.25% vs. 1.75%). In addition, there were favorable variances on the income from the disposal of equipment (\$258,000), Miscellaneous Revenue (\$230,000), and for emergency water supplied to Burlington (\$115,000). However, Energy Revenue was lower than budget by \$157,000 due to lower Demand Response payments of \$85,000 and Renewable Portfolio credits of \$31,000.

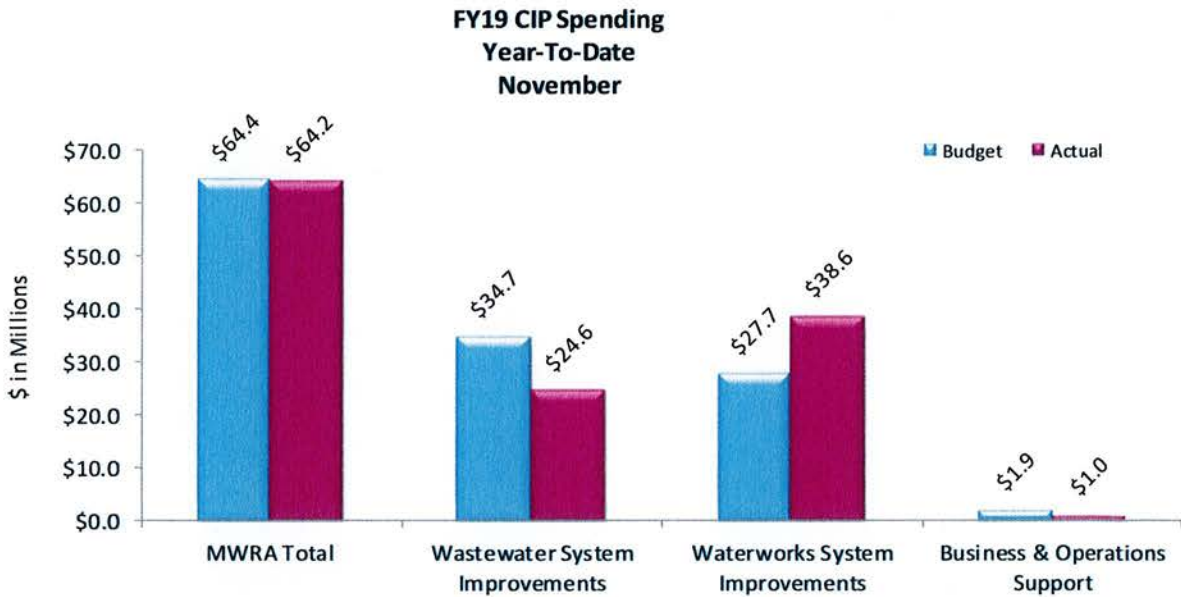
## **HEEC Cable Progress**

Progress payments on the new cable began in November 2018. \$18 million has been paid from Current Revenue for Capital representing MWRA's 50% of the \$36 million HEEC reports to have spent to date.

## FY19 Capital Improvement Program

Capital expenditures in Fiscal Year 2019 through November total \$64.2 million, \$0.2 million or 0.3% 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 Pipeline loan program, and the community managed Combined Sewer Overflow (CSOs) projects, capital spending totaled \$44.5 million, \$7.5 million or 14.4% under budget.



Overall CIP spending reflects the overspending of \$10.9 million in Waterworks Improvements, and underspending of \$10.2 million in Wastewater Improvements, and \$0.9 million in Business and Operations Support. Major variances in Waterworks are primarily due to greater than anticipated community requests for loans and contractor progress on the Northern Intermediate High Section 89 & 29 Construction Phase 2, Wachusett Aqueduct Pump Station, timing of watershed land purchases, partially offset by delay in notice to proceed for Southern Extra High (SEH) Section 111 Construction 3 and Bellevue Tank 2/Turkey Hill Painting contract awarded less than budget.

Wastewater variances are primarily due to construction delays for the Chelsea Creek Headworks Upgrades due to odor control foundation and Channel 1 work, less than anticipated community requests for grants and loans for the Infiltration/Inflow (I/I) Local Financial Assistance Program, Somerville Marginal In-System Storage project due to delay in Somerville construction award, Winthrop Terminal Facility VFD Replacement due to motor commissioning testing issue, Alewife Brook Pump Station Rehabilitation due to timing of final work, partially offset by contractor progress for the Gravity Thickener Rehabilitation contract, and work scheduled for FY18 that was completed in FY19 for the Reading Extension Sewer contract.

**FY19 Budget and FY19 Actual Year-to-Date Variance by Program**  
(in millions)

\$ in Millions	Budget	Actuals	\$ Var.	% Var.
<b>Wastewater System Improvements</b>				
Interception & Pumping	20.0	13.6	(6.3)	-31.7%
Treatment	3.1	2.9	(0.2)	-5.7%
Residuals	0.3	0.5	0.1	41.8%
CSO	1.9	0.5	(1.4)	-72.7%
Other	9.5	7.1	(2.4)	-25.4%
<b>Total Wastewater System Improvements</b>	<b>\$34.7</b>	<b>\$24.6</b>	<b>(\$10.2)</b>	<b>-29.2%</b>
<b>Waterworks System Improvements</b>				
Drinking Water Quality Improvements	0.8	0.4	(0.4)	-48.8%
Transmission	5.8	6.3	0.5	8.3%
Distribution & Pumping	16.3	18.4	2.1	12.8%
Other	4.9	13.6	8.7	179.5%
<b>Total Waterworks System Improvements</b>	<b>\$27.7</b>	<b>\$38.6</b>	<b>\$10.9</b>	<b>39.3%</b>
<b>Business &amp; Operations Support</b>	<b>\$1.9</b>	<b>\$1.0</b>	<b>(\$0.9)</b>	<b>-49.0%</b>
<b>Total MWRA</b>	<b>\$64.4</b>	<b>\$64.2</b>	<b>(\$0.2)</b>	<b>-0.3%</b>

*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:

**Other Waterworks:** Net overspending of \$8.7 million

- \$9.7 million for the Local Water System Assistance Program due to greater than anticipated loan requests, partially offset by \$0.8 million for Bellevue 2 and Turkey Hill Painting/Improvements contract being awarded less than budget and \$0.2 million for delay in notice to proceed of the Cosgrove Intake Roof Repair contract.

**Interception & Pumping:** Net underspending of \$6.3 million

- \$5.4 million for Chelsea Creek Upgrades Construction due to delays with odor control foundation and Channel 1 work.
- \$0.6 million for Alewife Brook Pump Station Construction due to timing of final work.
- \$0.3 million for DeLauri Pump Station Screens and Security due to timing of invoices.
- \$0.3 million for Nut Island Odor Control and HVAC Design due to delay in completion of design documents.
- \$0.2 million for Wastewater Metering Planning/Study/Design due to additional time needed to obtain temporary meter data.
- This underspending was partially offset by overspending of \$0.4 million for Reading Extension Sewer and \$0.3 million for Prison Point Piping Rehabilitation for work scheduled for FY18 that was completed in FY19.

**Other Wastewater:** Net underspending of \$2.4 million

- \$2.4 million for Community Infiltration/Inflow (I/I) due to less than budgeted requests for grants and loans.

**Water Distribution and Pumping:** Net overspending of \$2.1 million

- Overspending of \$2.0 million for NIH Section 89 & 29 Phase 2 Construction, \$0.4 million for Section 89/29 Redundancy Phase 1C Construction due to contractor progress, and \$0.4 million for NIH Section 89 & 29 Replacement Design, and \$0.2 million for Section 50 & 57 Water and Sections 21/20/19 Sewer Design due to consultant progress of work.
- This overspending was partially offset by \$0.9 million for SEH Construction 3 due to delay in notice to proceed, \$0.2 million for Section 23, 24, 47 Final Design CA/RI due to pending City of Newton MOA for pipe replacement and delayed utility relocation, and \$0.2 million for Section 14 Water Main Relocation (Malden) due to timing of final work.

**Combined Sewer Overflow:** Net underspending of \$1.4M

- \$1.4M for Somerville Marginal In-System Storage due to City of Somerville construction award was delayed.

**Business & Operations Support:** Net underspending of \$0.9 million

- \$0.5 million for As-Needed Technical Assistance due to timing of task order work, \$0.2 million for Maximo Upgrade due to timing of final work, \$0.2 million for timing of vehicle purchases.

**Waterworks Transmission:** Net overspending of \$0.5 million

- \$0.4 million for timing of Watershed Land purchases, \$0.5 million for Wachusett Aqueduct Pump Station Construction due to contractor progress, \$0.5 million for Maintenance Garage/Wash Bay Services due to schedule delay, \$0.4 million for Rosemary Brook Building Repair for FY18 work invoiced in FY19.
- This overspending was partially offset by underspending of \$0.5 million for Maintenance Garage/Wash Bay/Storage Building for schedule delay, \$0.2 million for WASM 3 MEPA/Design/CA/RI for test pit work that was delayed, and \$0.2 million for Commonwealth Avenue Pump Station Design Construction Administration/Resident Inspection due to timing of work.

**Drinking Water Quality Improvements:** Net underspending of \$0.4 million

- \$0.2 million for timing of task order work and \$0.1 million for the Marlborough Maintenance Facility due to work scheduled in FY19 completed in FY18.

**Wastewater Treatment:** Net underspending of \$0.2 million

- \$1.1 million for Winthrop Terminal Facility VFD Replacement Construction due to motor commissioning testing problem, \$0.3 million for Radio Repeater System Upgrade 1 due to delay in award, and \$0.2 million for Clinton Roof Rehabilitation due to delay in notice to proceed, partially offset by overspending of \$1.1 million for Gravity Thickener Rehabilitation due to contractor progress.

**Residuals:** Net overspending of \$0.1 million

- Overspending of \$0.1 million for Sludge Tank & Silo Coating due to work scheduled for FY18 completed in FY19.

**Construction Fund Balance**

The construction fund balance was \$72.2 million as of the end of November. Commercial Paper/Revolving Loan availability was \$222 million to fund construction projects.

**ATTACHMENTS:**

Attachment 1 – Variance Summary November 2018

Attachment 2 – Current Expense Variance Explanations

Attachment 3 – Capital Improvement Program Variance Explanations

ATTACHMENT 1  
FY19 Actuals vs. FY19 Budget

	November 2018 Year-to-Date				
	Period 5 YTD Budget	Period 5 YTD Actual	Period 5 YTD Variance	%	FY19 Approved
<b>EXPENSES</b>					
WAGES AND SALARIES	\$ 43,633,270	\$ 42,043,065	\$ (1,590,205)	-3.6%	\$ 107,032,021
OVERTIME	1,894,269	2,290,862	396,593	20.9%	4,447,554
FRINGE BENEFITS	8,651,698	8,264,345	(387,353)	-4.5%	21,173,571
WORKERS' COMPENSATION	1,009,420	1,035,504	26,084	2.6%	2,422,609
CHEMICALS	5,106,429	5,267,354	160,925	3.2%	10,830,452
ENERGY AND UTILITIES	8,941,320	8,799,463	(141,857)	-1.6%	22,868,632
MAINTENANCE	12,923,981	11,827,594	(1,096,387)	-8.5%	32,258,727
TRAINING AND MEETINGS	133,684	210,375	76,691	57.4%	455,770
PROFESSIONAL SERVICES	3,130,604	2,528,730	(601,874)	-19.2%	7,675,976
OTHER MATERIALS	1,986,935	1,771,461	(215,474)	-10.8%	7,381,098
OTHER SERVICES	9,880,526	10,179,659	299,133	3.0%	23,065,411
<b>TOTAL DIRECT EXPENSES</b>	<b>\$ 97,292,136</b>	<b>\$ 94,218,412</b>	<b>\$ (3,073,724)</b>	<b>-3.2%</b>	<b>\$ 239,611,821</b>
INSURANCE	\$ 888,064	\$ 692,784	\$ (195,280)	-22.0%	\$ 2,099,064
WATERSHED/PILOT	11,171,950	11,018,251	(153,699)	-1.4%	26,406,427
HEEC PAYMENT	577,842	321,690	(256,152)	-44.3%	1,386,832
MITIGATION	682,957	682,957	-	0.0%	1,614,262
ADDITIONS TO RESERVES	796,147	796,147	-	0.0%	1,881,797
RETIREMENT FUND	7,000,000	7,000,000	-	0.0%	7,000,000
POST EMPLOYEE BENEFITS	-	-	-	---	5,574,152
<b>TOTAL INDIRECT EXPENSES</b>	<b>\$ 21,116,960</b>	<b>\$ 20,511,829</b>	<b>\$ (605,129)</b>	<b>-2.9%</b>	<b>\$ 45,962,534</b>
STATE REVOLVING FUND	\$ 35,479,551	\$ 35,219,997	\$ (259,554)	-0.7%	\$ 89,380,363
SENIOR DEBT	113,864,376	113,864,376	-	0.0%	272,633,982
CORD FUND	-	-	-	---	-
DEBT SERVICE ASSISTANCE	(944,726)	(944,726)	-	0.0%	(944,726)
CURRENT REVENUE/CAPITAL	6,007,689	6,007,689	-	0.0%	14,199,991
SUBORDINATE MWRA DEBT	38,622,824	38,622,824	-	0.0%	92,032,292
LOCAL WATER PIPELINE CP	2,009,783	2,009,783	-	0.0%	4,750,396
CAPITAL LEASE	1,361,064	1,361,064	-	0.0%	3,217,060
DEBT PREPAYMENT	-	-	-	---	7,100,000
VARIABLE DEBT	-	(3,110,866)	(3,110,866)	---	-
HEEC CABLE CAPACITY RESERV	-	-	-	---	-
DEFEASANCE ACCOUNT	-	-	-	---	-
<b>TOTAL DEBT SERVICE</b>	<b>\$ 196,400,561</b>	<b>\$ 193,030,141</b>	<b>\$ (3,370,420)</b>	<b>-1.7%</b>	<b>\$ 482,369,358</b>
<b>TOTAL EXPENSES</b>	<b>\$ 314,809,657</b>	<b>\$ 307,760,382</b>	<b>\$ (7,049,273)</b>	<b>-2.2%</b>	<b>\$ 767,943,713</b>
<b>REVENUE &amp; INCOME</b>					
RATE REVENUE	\$ 312,671,700	\$ 312,671,700	\$ -	0.0%	\$ 739,042,200
OTHER USER CHARGES	4,203,147	4,242,082	38,935	0.9%	9,328,768
OTHER REVENUE	3,609,897	4,047,427	437,530	12.1%	6,013,635
RATE STABILIZATION	-	-	-	---	-
INVESTMENT INCOME	5,543,602	6,348,960	805,358	14.5%	13,559,110
<b>TOTAL REVENUE &amp; INCOME</b>	<b>\$ 326,028,346</b>	<b>\$ 327,310,169</b>	<b>\$ 1,281,823</b>	<b>0.4%</b>	<b>\$ 767,943,713</b>

**ATTACHMENT 2**  
**Current Expense Variance Explanations**

Total MWRA	FY19 Budget YTD November	FY19 Actuals YTD November	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
<b><u>Direct Expenses</u></b>					
Wages & Salaries	43,633,270	42,043,065	(1,590,205)	-3.6%	Wages and Salaries are under budget by \$1.6 million. Year to date, there have been 21 fewer average FTEs (1,134 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	1,894,269	2,290,862	396,593	20.9%	Higher spending mainly in <b>Wastewater Operations</b> of \$294,000 for wet weather events.
Fringe Benefits	8,651,698	8,264,345	(387,353)	-4.5%	Lower than budget mainly in <b>Health Insurance</b> of \$375,000, 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	1,009,420	1,035,504	26,084	2.6%	The higher expenses were due to <b>Compensation</b> payments and reserves of \$211,000, offset by lower <b>Medical</b> payments and reserves of \$143,000, and <b>Administrative Expenses</b> of \$42,000. Due to the uncertainties of when spending will happen, the budget is spread evenly through out the year.

**ATTACHMENT 2**  
**Current Expense Variance Explanations**

Total MWRA	FY19 Budget YTD November	FY19 Actuals YTD November	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
Chemicals	5,106,429	5,267,354	160,925	3.2%	Overspending for <b>Activated Carbon</b> of \$158,000 for the unbudgeted replacement of carbon at Nut Island Headworks and Braintree Weymouth IPS for odor control; <b>Sodium Hypochlorite</b> of \$140,000; 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 required higher dosage to disinfect the water, and DITP & Wastewater Ops due to wet weather; <b>Sodium Bisulfite</b> of \$104,000 at DITP and Wastewater Ops. This is offset by underspending in <b>Soda Ash</b> of \$148,000 at CWTP and Clinton; and <b>Hydrogen Peroxide</b> of \$123,000 at DITP. DITP flows are 0.5% higher than the budget and CWTP flows are 3% less than the budget through November. 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	8,941,320	8,799,463	(141,857)	-1.6%	Underspending in <b>Diesel Fuel</b> of \$578,000 in DITP due to timing of delivery (started in December), offset by over spending in Wastewater Ops due to timing of deliveries. In addition, this is offset by overspending in <b>Electricity</b> of \$443,000 primarily at DITP and Field Operations.



**ATTACHMENT 2**  
**Current Expense Variance Explanations**

Total MWRA	FY19 Budget YTD November	FY19 Actuals YTD November	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
Maintenance	12,923,981	11,827,594	(1,096,387)	-8.5%	<p>Services were underspent by \$1.4 million and Materials were overspent by \$290,000.</p> <p>Underspending in <b>Plant &amp; Machinery Services</b> of \$1.2 million due to timing of boiler/steam turbine generator (STG) annual maintenance planned for October and November which some of the work is being done in December and the remaining work will be in the spring; <b>Building &amp; Grounds Services</b> of \$349,000 in FOD primarily for timing of invasives control at the reservoirs and the fuel storage tank replacement at Union Park CSO facility; <b>Specialized Equipment Services</b> of \$157,000 in DITP for timing of PICS upgrade, and OEP for Authority wide security system maintenance contract; and HVAC Materials of \$108,000 in DITP for timing of replacing heating coils in Secondary.</p> <p>Overspending in <b>Computer Software Licenses/Upgrades</b> of \$165,000 in MIS; <b>Specialized Equipment Materials</b> of \$149,000 primarily in FOD for Prison Point wash-down system piping; <b>Electrical Services</b> of \$101,000 in FOD for timing of electrical service contract.</p>
Training & Meetings	133,684	210,375	76,691	57.4%	Overspending in Operations at FOD and MIS.
Professional Services	3,130,604	2,528,730	(601,874)	-19.2%	<p>Underspending in <b>Engineering Services</b> of \$184,000 in Operations primarily at Reservoir Ops for timing of dam asset maintenance plans and DITP for timing of biosolids exemptions included in MDAR Regulation 330 CMR 31.00study of MWRA pellets; <b>Other Professional Services</b> of \$180,000 in HR for Training and the Pay Equity Study, Finance and Law; <b>Legal Services</b> of \$102,000 in Law and HR; <b>Lab &amp; Testing Analysis</b> of \$94,000 in EnQual Wastewater and Lab Services; and <b>Computer System Consultants</b> of \$67,000 in MIS.</p>

**ATTACHMENT 2**  
**Current Expense Variance Explanations**

Total MWRA	FY19 Budget YTD November	FY19 Actuals YTD November	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
Other Materials	1,986,935	1,771,461	(215,474)	-10.8%	Lower than budgeted spending in <b>Computer Hardware</b> of \$203,000 in MIS for timing of the roll out of PC replacements; <b>Equipment/Furniture</b> of \$93,000 in Operations for timing of water quality equipment; and furniture at DITP; and <b>Other Materials</b> of \$36,000 in Clinton for gravel and Residuals for plastic bags for fertilizer. This is offset by higher than budgeted spending in <b>Lab &amp; Testing Supplies</b> of \$64,000 in Laboratory Services; and <b>Office Supplies</b> of \$32,000 in Operations
Other Services	9,880,526	10,179,659	299,133	3.0%	Higher than budgeted spending for <b>Sludge Pelletization</b> of \$495,000 due to higher year to date quantities related to Struvite control and the gravity thickener emergency repairs. This is offset by lower spending for <b>Other Services</b> of \$116,000 for a number of services, including the switch from renting modems to purchasing them for the Contaminant Monitoring System in Water Quality Assurance; remediation projects managed by Real Property/Environmental Management; and timing of Technical Assistance for Lead issues in Planning. <b>Telephone/Data Services</b> of \$116,000 in MIS and FOD; and <b>Membership/Dues/Subscriptions</b> of \$82,000 in Operations due to timing.
<b>Total Direct Expenses</b>	<b>97,292,136</b>	<b>94,218,412</b>	<b>(3,073,724)</b>	<b>-3.2%</b>	

**ATTACHMENT 2**  
**Current Expense Variance Explanations**

Total MWRA	FY19 Budget YTD November	FY19 Actuals YTD November	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
<b>Indirect Expenses</b>					
Insurance	888,064	692,784	(195,280)	-22.0%	Lower claims than budgeted of \$164,000 and premiums of \$32,000.
Watershed/PILOT	11,171,950	11,018,251	(153,699)	-1.4%	Lower Watershed Reimbursement of \$154,000 million due to over accrual at the end of FY18 as compared to the actual amount paid in the first quarter of FY19.
HEEC Payment	577,842	321,690	(256,152)	-44.3%	Lower than budgeted spending on special projects related to the HEEC cable.
Mitigation	682,957	682,957	-	0.0%	
Addition to Reserves	796,147	796,147	-	0.0%	
Pension Expense	7,000,000	7,000,000	-	0.0%	
Post Employee Benefits	-	-	-		
<b>Total Indirect Expenses</b>	<b>21,116,960</b>	<b>20,511,829</b>	<b>(605,131)</b>	<b>-2.9%</b>	
<b>Debt Service</b>					
Debt Service	197,345,287	193,974,867	(3,370,420)	-1.7%	\$2.5 million for lower than budgeted variable rate, and a combination of lower cost of borrowing and assumed versus actual borrowing terms for SRF funds.
Debt Service Assistance	(944,726)	(944,726)	-	0.0%	
<b>Total Debt Service Expenses</b>	<b>196,400,561</b>	<b>193,030,141</b>	<b>(3,370,420)</b>	<b>-1.7%</b>	
<b>Total Expenses</b>					
<b>Total Expenses</b>	<b>314,809,657</b>	<b>307,760,382</b>	<b>(7,049,275)</b>	<b>-2.2%</b>	
<b>Revenue &amp; Income</b>					
Rate Revenue	312,671,700	312,671,700	-	0.0%	
Other User Charges	4,203,147	4,242,082	38,935	0.9%	Higher DITP water costs of \$59,000.
Other Revenue	3,609,897	4,047,427	437,530	12.1%	\$258,000 for disposal of surplus materials, Miscellaneous Revenue of \$230,000 primarily associated with worker's compensation reimbursement for older claims; \$115,000 for emergency water supplied to Burlington and \$37,000 unanticipated Cambridge water usage. This is offset by lower energy revenue received of \$157,000.

**ATTACHMENT 2  
Current Expense Variance Explanations**

Total MWRA	FY19 Budget YTD November	FY19 Actuals YTD November	FY19 YTD Actual vs. FY19 Budget		Explanations
			\$	%	
Investment Income	5,543,602	6,348,960	805,358	14.5%	Investment Income is over budget mostly due to short term rates higher than budget (2.25% vs.1.75% budget).
<b>Total Revenue</b>	<b>326,028,346</b>	<b>327,310,169</b>	<b>1,281,823</b>	<b>0.4%</b>	
<b>Net Revenue in Excess of Expenses</b>	<b>11,218,689</b>	<b>19,549,787</b>	<b>8,331,098</b>		

**ATTACHMENT 3  
FY19 CIP Year-to-Date Variance Report (000's)**

	FY19 Budget YTD November	FY19 Actuals YTD November	YTD Actuals vs. Budget		Explanations
			\$	%	
<b>Wastewater</b>					
Interception & Pumping (I&P)	\$19,973	\$13,639	(\$6,334)	-31.7%	<u>Underspending</u> Chelsea Creek Headworks Upgrades - Construction and REI: \$5.4M (due to Channel 1 and odor control foundation delays) Alewife Brook Pump Station Rehab - Construction: \$626k (due to timing of final work) DeLauri Pump Station Screens and Security: \$292k (timing of payments) Wastewater Meter System Planning/Study/Design: \$222k (due to additional time for acquisition of metering data) Nut Island Odor Control & HVAC Design/CA/REI: \$328k (delay in completion of design documents) Miscellaneous contracts totaling \$172k. <u>Offset Overspending</u> Interceptor Renewal 1, Reading Extension Sewer - Construction: \$444k, and Prison Point Pipeline Rehabilitation - Design/CA/RI: \$262k (work scheduled for FY18 performed in FY19)
Treatment	\$3,075	\$2,901	(\$175)	-5.7%	<u>Underspending</u> WTF VFD Replacement - Construction: \$1.1M (due to motor commissioning testing problem) Radio Repeater System Upgrades - Phase 1: \$250k (award delayed and was less than budgeted) Clinton Roofing Rehabilitation: \$247k (schedule shift) <u>Offset Overspending</u> Gravity Thickener Rehab: \$1.3M (contractor progress) Other smaller projects totaling \$122k.
Residuals	\$324	\$459	\$135	41.8%	<u>Overspending</u> Sludge Tank & Silo Coating: \$135k (due to work scheduled for FY18 completed in FY19)
CSO	\$1,883	\$513	(\$1,370)	-72.7%	<u>Underspending</u> Somerville Marginal In-System Storage: \$1.4M (Somerville construction schedule change)
Other Wastewater	\$9,490	\$7,078	(\$2,413)	-25.4%	<u>Underspending</u> I/I Local Financial Assistance: \$2.4M (less than budgeted requests for grants and loans)
<b>Total Wastewater</b>	<b>\$34,746</b>	<b>\$24,590</b>	<b>(\$10,155)</b>	<b>-29.2%</b>	




**ATTACHMENT 3**  
**FY19 CIP Year-to-Date Variance Report (000's)**

	FY19 Budget YTD November	FY19 Actuals YTD November	YTD Actuals vs. Budget		Explanations
			\$	%	
<b>Waterworks</b>					
Drinking Water Quality Improvements	\$773	\$396	(\$377)	-48.8%	<u>Underspending</u> Technical Assistance: \$242k (due to timing of task order work) Miscellaneous contracts totaling \$135k
Transmission	\$5,789	\$6,268	\$479	8.3%	<u>Overspending</u> Watershed Land Acquisition: \$725k (timing of land purchases) Wachusett Aqueduct Pump Station - Construction: \$489k (due to project progress) Rosemary Brook Siphon Building Repair: \$386k (timing of final payment) <u>Offset Underspending</u> Maintenance Garage/Wash Bay/Storage Building: \$450k (schedule delay) WASM 3 - MEPA/Design/CA/RI: \$214k (test pits work delayed) Commonwealth Avenue Pump Station Improvements - Design/CA/RI: \$185k (timing of work) Miscellaneous contracts totaling \$272k.
Distribution & Pumping	\$16,312	\$18,406	\$2,094	12.8%	<u>Overspending</u> NIH Section 89/29 Redundancy Phase 1B and 1C and Phase 2 : \$2.6M, Section 89/29 Replacement - Design: \$359k, Sections 50 & 57 Water & 19/20/21 Sewer Rehab - Design/ESDC: \$234k, SEH Redundancy Pipeline Section 111 - Construction 2: \$166k, and Section 89 & 29 Redundancy - Design: \$158k (all due to project progress) <u>Offset Underspending</u> SEH Redundancy Pipeline Section 111 - Construction 3: \$928k (due to delay in notice to proceed) New Connecting Mains CP3 (Sect 23,24,47) - Final Design/CA/RI: \$215k (pending City of Newton MOA for pipe replacement and delayed utility relocation) Section 14 Water Pipe Relocation (Malden): \$180k (work scheduled for FY19 performed in FY18) Miscellaneous contracts totaling \$100k.
Other Waterworks	\$4,852	\$13,562	\$8,710	-	<u>Overspending</u> Local Water Pipeline Financial Assistance Program: \$9.7M (greater than budgeted requests for loans) <u>Offset Underspending</u> Bellevue II & Turkey Hill Water Tanks Repainting: \$771k (award less than budgeted) Cosgrove Intake Roof Replacement: \$240k (schedule shift)
<b>Total Waterworks</b>	<b>\$27,726</b>	<b>\$38,632</b>	<b>\$10,906</b>	<b>39.3%</b>	

**ATTACHMENT 3**  
**FY19 CIP Year-to-Date Variance Report (000's)**

	FY19 Budget YTD November	FY19 Actuals YTD November	YTD Actuals vs. Budget		Explanations
			\$	%	
<b>Business &amp; Operations Support</b>					
<b>Total Business &amp; Operations Support</b>	\$1,879	\$958	(\$921)	-49.0%	<u>Underspending</u> As-Needed Technical Assistance: \$462k (due to timing of task order work) MIS Projects: \$240k (mostly due to timing of final MAXIMO Upgrade work) FY19-23 Vehicle Purchases: \$235k (timing of vehicle purchases)
<b>Total MWRA</b>	\$64,351	\$64,180	(\$171)	-0.3%	


## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Transmittal of the FY20 Proposed Capital Improvement Program to the MWRA Advisory Board

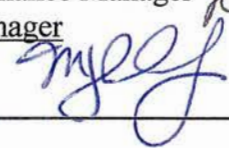
---

**COMMITTEE:** Administration, Finance & Audit

INFORMATION  
 VOTE

James J. Coyne, Assistant Finance Manager 

Michael J. Cole, Budget Manager

Preparer/Title 

  
Thomas J. Durkin

Director, Finance

---

### RECOMMENDATION:

To approve the transmittal of the FY20 Proposed Capital Improvement Program to the Advisory Board for its 60-day review and comment period.

### DISCUSSION:

The Fiscal Year 2020 Proposed Capital Improvement Program (CIP) represents an update to the program approved by the Board in June 2018 for Fiscal Year 2019. The Proposed CIP includes the latest cost estimates, revised schedules, and new projects.

The FY20 Proposed Capital Improvement Program projects \$249.8 million spending for FY20, of which \$169.7 million supports Wastewater System Improvements, \$65.4 million supports Waterworks System Improvements, and \$14.7 million is for Business and Operations Support. The projects with significant spending include Infiltration/Inflow Local Financial Assistance, Clarifier Rehabilitation Phase 2 Construction, Chelsea Creek Headworks Upgrades, Prison Point Rehabilitation, Southern Extra High Redundancy projects, Nut Island Odor Control and HVAC Improvements, and Local Water System Assistance Program.

The CIP Program continues to address critical redundancy improvements for the Metropolitan Tunnel System. The FY20 CIP includes approximately \$1.4 billion in spending, the same as in the Final FY19 budget. The initial contract to be awarded is for Program Support Services which is budgeted at \$13.6 million over a nine-year period beginning in late FY19.

The FY20 Proposed Capital Program reaffirms MWRA's commitment to the community financing assistance programs on both the water and wastewater side.

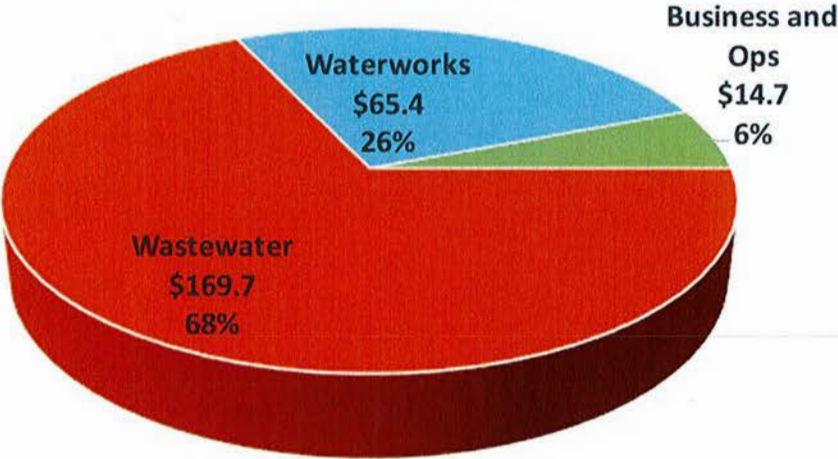


Today, the Authority is better positioned to reinvest in rehabilitation and replacement of aging facilities as result of conservative fiscal management which includes judicious control of expenses, and the fact that MWRA has implemented the practice of utilizing available funds for defeasances resulting in the reduction of debt service expense. MWRA projects an overall reduction in outstanding principal of debt during the FY19-23 cap period.

**FY20 Proposed CIP**

**Proposed Spending**

The FY20 Proposed Capital Improvement Program projects \$249.8 million spending for FY20, of which \$169.7 million supports Wastewater System Improvements, \$65.4 million supports Waterworks System Improvements, and \$14.7 million is for Business and Operations Support.



The FY20 Proposed CIP includes \$35.4 million for community assistance programs, which are a combination of loan and partial grant programs, with net expenditures of \$25.7 million for the local Infiltration/Inflow program and net expenditures of \$9.7 million for the local water pipeline program.

Project contracts with spending greater than approximately \$6 million in FY20, excluding local community assistance programs, total \$104.7 million and account for nearly 42% of the total annual spending.

Project	Contract	Projected FY20 Expenditures \$s in millions
DI Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	\$23.1
Facility Asset Protection	Chelsea Creek Upgrades - Construction	\$19.3
Facility Asset Protection	Prison Point Rehabilitation Construction	\$18.6
Local Water System Assistance Program	Phase 2 Loan Distributions	\$16.0
Local Water System Assistance Program	Phase 3 Loan Distributions	\$12.0
Corrosion & Odor Control	Nut Island Odor Control HVAC Improvement Construction Ph 2	\$10.0
DI Treatment Plant Asset Protection	HVAC Equipment Replacement Construction	\$8.0
SEH Redundancy & Storage	Redundancy Pipeline Sect 111 - Construction 3	\$7.0
I/I Local Financial Assistance	Phase IX Grants	\$7.5
I/I Local Financial Assistance	Phase X Grants	\$7.5
Residuals Asset Protection	Residuals Electrical/Mechanical/Drum Dryer Replacement	\$6.4
DI Treatment Plant Asset Protection	Gravity Thickener Rehabilitation	\$6.3
New Connecting Mains -Shaft 7 to WASM 3	CP3 Sections 23, 24, 47 Rehabilitation	\$6.0
	<b>Total Contracts &gt; \$6.0 million</b>	<b>\$147.7</b>
	<b>% of FY20 Spending</b>	<b>59.1%</b>
	<b>Excluding Community Loan Programs</b>	<b>\$104.7</b>
	<b>% of FY20 Spending</b>	<b>41.9%</b>
	<b>Total Projected FY20 Spending</b>	<b>\$249.8</b>

**Chelsea Creek Headworks Upgrade Construction** - \$19.3 million (\$81.8 million total construction cost). This major rehabilitation project includes replacement/upgrade to the screens, grit collection system, grit and handling systems, odor control systems, HVAC, mechanical, plumbing and instrumentation. Solids handling systems are being automated and the building's egress and fire suppressions systems are also being upgraded.

**Prison Point Rehabilitation Construction** - \$18.6 million (\$36.3 million total construction cost). This rehabilitation will include upgrades to the facility including replacement of diesel pump engines, dry weather screens, wet weather screens, sluice gates, chemical tanks, updating of other facility equipment including electrical distribution and chemical disinfection systems, and repair/replacement of miscellaneous equipment. Improvement/installation of systems as appropriate for energy efficiencies, security, and fire alarm will also be included.

**Nut Island Odor Control and HVAC Improvements - Construction Phase 2** - \$10.0 million (\$39.9 million total construction cost). Improvements to the Nut Island Headworks odor control, HVAC and energy management systems. These are the long-term improvement projects that arose following the January 2016 fire and the odor control, HVAC and energy management systems evaluation contract completed in February 2017.

**Southern Extra High Redundancy Section 111 Phase 3 Construction** - \$7.0 million (\$19.1 million total construction cost). This is a redundancy project for MWRA's Southern Extra High service area. This project will provide redundancy to Sections 77 and 88 serving Boston, Norwood, Stoughton, and Dedham-Westwood through construction of a redundant pipeline. Phase 1 was substantially complete in September 2018. Phase 2 and Phase 3 began in October 2017 and June 2018, respectively.

**New Connecting Mains - Shaft 7 to WASM 3 – CP3 Sections 23, 24, 47 Rehabilitation** - \$6.0 million (\$14.3 million total construction cost). This project includes cleaning and lining 21,950 linear feet of 20-inch diameter pipe (Sections 24 and 47) and 5,800 linear feet of 36-inch diameter pipe (Section 23).

**Deer Island Wastewater Treatment Plant Asset Protection and Residuals:**

**Clarifier Rehabilitation Phase 2 Construction** - \$23.1 million (\$135.0 million total construction cost). This project will rehabilitate the sludge removal system in the primary tanks and the aeration/recirculation systems in the secondary tanks. The influent gates, effluent launders and aeration systems, and concrete corrosion in primary clarifiers will also be addressed and repaired.

**HVAC Equipment Replacement Construction** - \$8.0 million (\$40.2 million total construction cost). Replace two obsolete HVAC control systems, reducing replacement parts and improving automation. Project includes central lab fume hoods and East/West Odor Control Handler replacements.

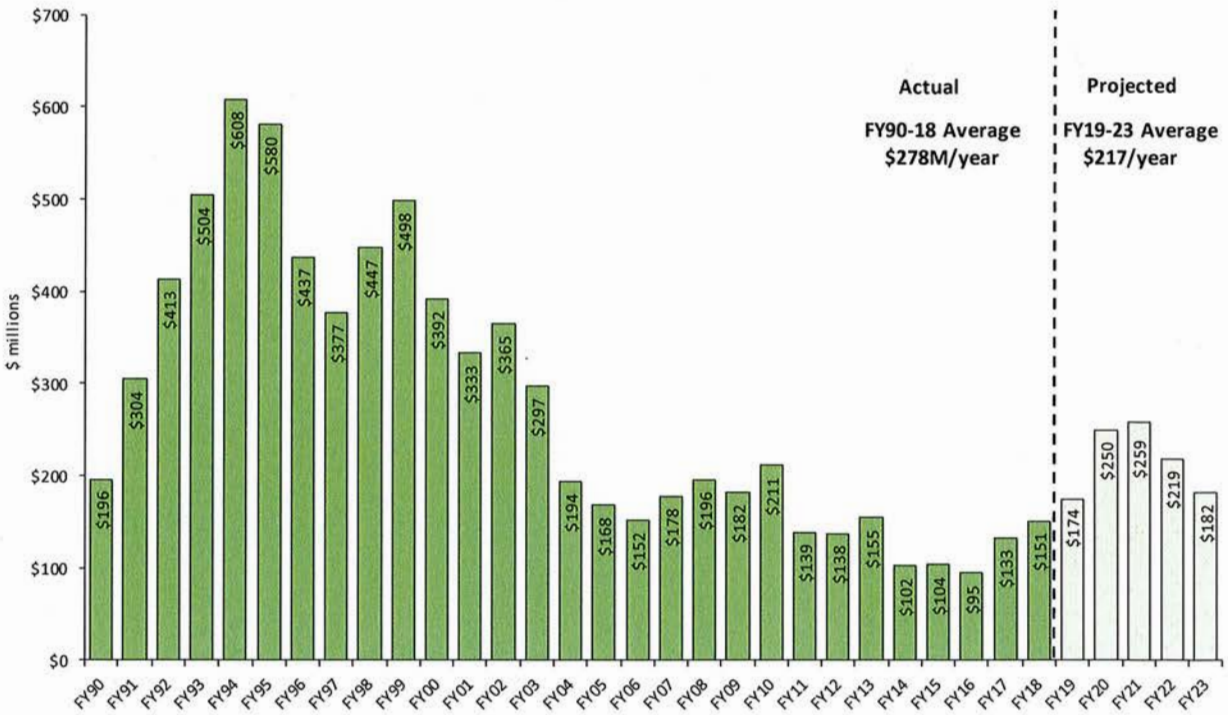
**Gravity Thickener Rehabilitation** - \$6.3 million (\$19.6 million total construction cost). This project involves installing catwalks around the perimeter of several tanks, removing concrete blocks in the effluent channels, and modifying the sludge thickener roofing to improve staff access and operating efficiency.

**Residuals Electrical/Mechanical/Drum Dryer Replacement** - \$6.4 million (\$8.6 million total construction cost). This project includes mechanical and electrical improvements to the Residuals Facility. Also, includes drum dryer replacement.

## Historical Spending

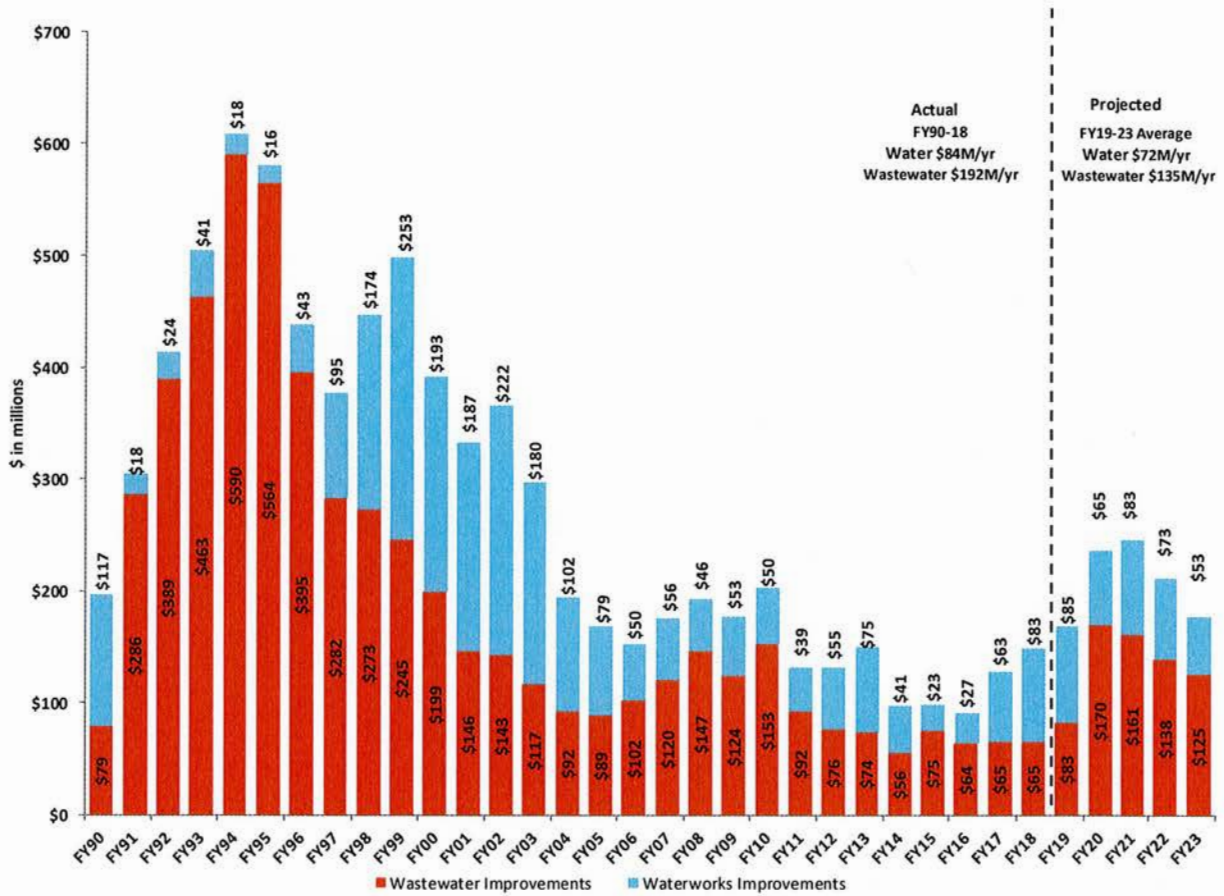
The chart below captures the historical CIP spending through FY18 and projects spending through FY23 based on the FY20 Proposed CIP. Average annual CIP spending through FY18 was \$278 million. Average annual CIP spending for the proposed FY19-23 Cap is projected to be \$217 million.

Annual CIP Spending



The following chart shows the historical CIP spending from FY90 through FY18 by utility with projections through FY23. Average annual CIP spending through FY18 was \$84 million for Waterworks and \$192 million for Wastewater. Average annual CIP spending for the proposed FY19-23 Cap is projected to be \$72 million for Waterworks and \$135 million for Wastewater.

Annual CIP Spending by Utility



The spending projections set forth here include updates to the approved FY19 CIP with the latest cost estimates, revised schedules, and new projects.



## FY19-23 Five-Year Spending Cap

Spending during the FY19-23 timeframe is planned to be \$1.1 billion, including local community spending of \$134.8 million for the I/I loan and grant program and \$37.5 for the water pipeline loan program.

Annual cash flows for the proposed Cap period are shown below in millions:

FY20 Proposed		FY19	FY20	FY21	FY22	FY23	Total FY19-23
		Projected Expenditures	\$174.3	\$249.8	\$258.7	\$218.8	\$182.3
	I/I Program	(29.0)	(25.7)	(25.0)	(28.2)	(26.9)	(134.8)
	Water Loan Program	(22.4)	(9.7)	(5.2)	(4.4)	4.2	(37.5)
	<b>MWRA Spending</b>	<b>122.9</b>	<b>214.4</b>	<b>228.5</b>	<b>186.1</b>	<b>159.6</b>	<b>\$911.6</b>
	Contingency	0.0	13.6	14.8	12.5	10.7	51.6
	Inflation on Unawarded Construction	0.0	2.1	5.5	6.2	7.6	21.4
	Chicopee Valley Aqueduct Projects	(0.0)	0.0	0.0	0.0	0.0	(0.0)
	<b>FY19 Proposed FY19-23 Spending</b>	<b>\$122.9</b>	<b>\$230.1</b>	<b>\$248.8</b>	<b>\$204.7</b>	<b>\$178.0</b>	<b>\$984.6</b>

The format of the Cap table has changed 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.

The proposed FY19-23 cap cash flow totals \$984.6 million, approximately matching the recently approved Cap of \$984.8 million.

Yearly projected expenditures for the Proposed FY19-23 Cap period by program are shown below in millions:

	FY19	FY20	FY21	FY22	FY23	Total FY19-23
<b>Wastewater System Improvements</b>	<b>\$82.8</b>	<b>\$169.7</b>	<b>\$161.4</b>	<b>\$138.5</b>	<b>\$124.7</b>	<b>\$677.1</b>
Interception & Pumping	39.7	65.3	50.0	28.8	19.5	203.3
Treatment	12.1	66.4	80.6	80.7	77.3	317.2
Residuals	0.5	8.3	3.5	0.7	1.0	14.0
CSO	1.4	4.0	2.3	0.0	0.0	7.7
Other Wastewater	29.0	25.7	25.0	28.2	26.9	134.8
<b>Waterworks System Improvements</b>	<b>\$85.2</b>	<b>\$65.4</b>	<b>\$83.5</b>	<b>\$73.2</b>	<b>\$52.6</b>	<b>\$359.9</b>
Drinking Water Quality Improvements	1.8	3.1	3.6	3.4	1.3	13.2
Transmission	10.5	15.2	40.0	36.8	29.0	131.6
Distribution & Pumping	43.6	31.3	28.2	21.0	16.3	140.3
Other Waterworks	29.3	15.8	11.7	12.0	5.8	74.7
<b>Business &amp; Operations Support</b>	<b>6.4</b>	<b>14.7</b>	<b>13.9</b>	<b>7.1</b>	<b>5.0</b>	<b>47.0</b>
<b>Total MWRA</b>	<b>\$174.3</b>	<b>\$249.8</b>	<b>\$258.7</b>	<b>\$218.8</b>	<b>\$182.3</b>	<b>\$1,083.9</b>

It is important to emphasize that the majority of spending within the Wastewater and Waterworks programs is concentrated in several larger projects with significant spending in the FY19-23 timeframe. Project contracts with expenditures greater than \$15 million for the FY19-23 Cap total \$685.3 million, which includes local community assistance programs, and accounts for 63% of total spending. Large initiatives include the Clarifier Rehabilitation at Deer Island and Chelsea Creek Upgrades at \$125.0 million (\$135.0 million total cost) and \$50.3 million (\$81.8 million total cost), respectively between FY19-23.

The table below highlights major project spending in the FY19-23 timeframe:

Project	Contract	Projected FY19-23 Expenditures \$s in millions
DI Treatment Plant Asset Protection	Clarifier Rehabilitation Phase 2 - Construction	\$125.0
Local Water Pipeline Improvement	Phase 3 Loans - Distributions	\$85.3
Local Water Pipeline Improvement	Phase 2 Loans - Distributions	\$59.9
Facility Asset Protection	Chelsea Creek Headworks Upgrades - Construction	\$50.3
DI Treatment Plant Asset Protection	HVAC Equipment Replacement - Construction	\$40.2
Corrosion & Odor Control	Nut Island Odor Control HVAC Improvements - Construction	\$37.4
Facility Asset Protection	Prison Point Rehabilitation - Construction	\$36.3
I/I Local Financial Assistance	Phase X Grants	\$36.0
I/I Local Financial Assistance	Phase XI Grants	\$35.0
I/I Local Financial Assistance	Phase IX Grants	\$26.3
Local Water Pipeline Improvement	Lead Service Line Replacement Loans	\$24.0
I/I Local Financial Assistance	Phase XII Grants	\$21.0
Metro Redundancy Interim Improvements	WASM 3 Construction 1	\$20.4
DI Treatment Plant Asset Protection	Gravity Thickener Rehabilitation	\$19.3
SEH Redundancy and Storage	Redundancy Pipeline Sect 111 - Construction 3	\$19.1
NIH Redundancy & Storage	Section 89 & 29 Redundancy - Construction 2	\$18.3
NIH Redundancy and Storage	Section 89 & 29 Replacement - Construction	\$16.0
DI Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	\$15.5
	<b>Total Contracts &gt; \$15.0 million</b>	<b>\$685.3</b>
	<b>% of FY19-23 Spending</b>	<b>63.2%</b>
	<b>Excluding Community Loan Programs</b>	<b>\$397.8</b>
	<b>% of FY19-23 Spending</b>	<b>36.7%</b>
	<b>Total Projected FY19-23 Spending</b>	<b>\$1,083.9</b>

Asset Protection accounts for the largest share of capital expenditures for the FY19-23 period. The FY20 Proposed CIP includes \$773.4 million for asset protection initiatives, representing over 71% of total MWRA spending in this timeframe. Wastewater and Waterworks Asset Protection are \$666.6 million and \$91.8 million, respectively. Deer Island Treatment Plant Asset Protection accounts for over \$309 million in spending. Spending for water system redundancy projects totals \$213.2 million in the same FY19-23 period, accounting for 19.7% of total spending.



**Changing nature of the CIP by Category**  
(\$s in millions)

Project Category	FY14-18	FY19-23	FY24-28
Asset Protection	\$284.6	\$773.4	\$1,095.4
Water Redundancy	174.6	213.2	\$373.5
CSO	64.7	7.7	\$0.0
Other	61.7	89.6	\$109.5
<b>Total</b>	<b>\$585.6</b>	<b>\$1,083.9</b>	<b>\$1,578.4</b>
Asset Protection	48.6%	71.4%	69.4%
Water Redundancy	29.8%	19.7%	23.7%
CSO	11.0%	0.7%	0.0%
Other	10.5%	8.3%	6.9%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

**FY20 New Projects**

The FY20 Proposed CIP adds \$54.5 million in new projects of which Wastewater projects total \$48.8 million, Waterworks projects total \$0.8 million, and Business and Operations Support total \$5.0 million.

\$s in millions

Project	Total Contract Amount	FY19-23 Spending
Wastewater	\$ 48.8	\$ 4.4
Waterworks	\$ 0.8	\$ 0.8
Business & Operations Support	\$ 5.0	\$ 5.0
<b>Total New Projects</b>	<b>\$ 54.5</b>	<b>\$ 10.2</b>

The following table shows the new projects added by the major programs:

**\$s in millions**

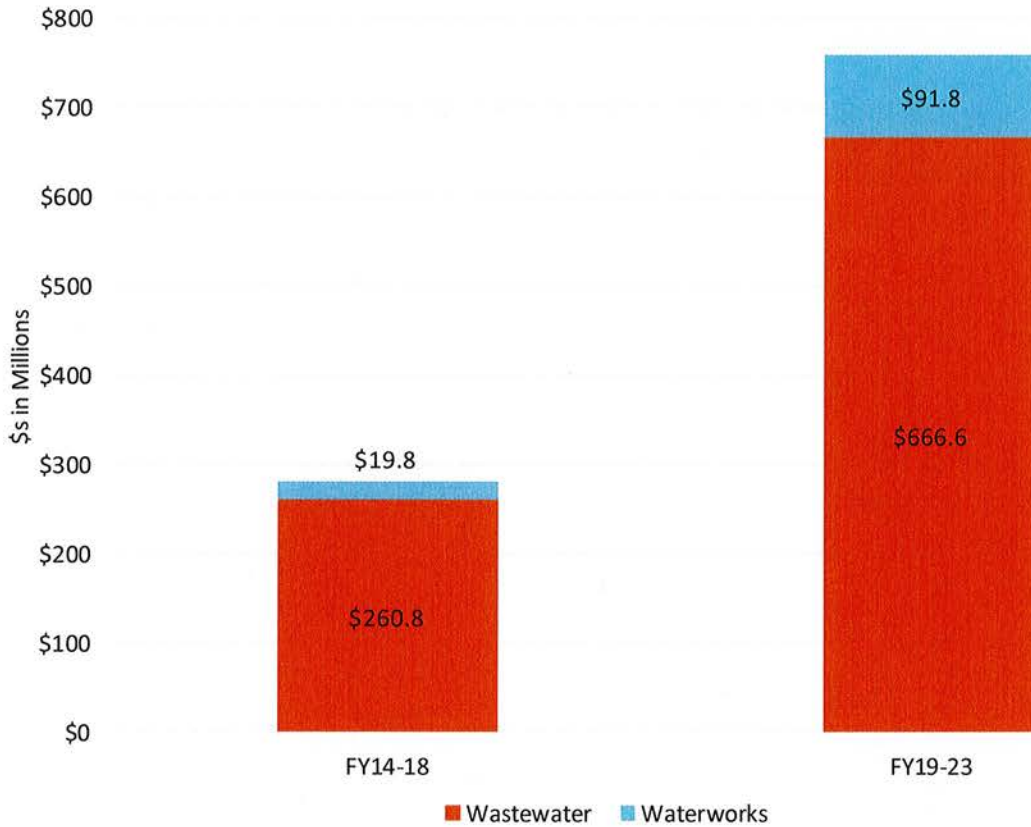
Project	Total Contract Amount	FY19-23
Pump Stations & CSO Facility Rehab Construction	\$ 37.5	\$ -
Pump Stations & CSO Facility Rehab Design/CA/REI	\$ 7.5	\$ 0.7
Deer Island As-Needed REI	\$ 3.0	\$ 3.0
Sections 191 & 192 Charles River Valley Sewer	\$ 0.5	\$ 0.5
Clinton Equipment & Supplies Storage Building	\$ 0.3	\$ 0.3
Carroll Water Treatment Plant Emergency Generator No.1 Replacement (Electric Portion)	\$ 0.8	\$ 0.8
As-Needed Design Contract 18	\$ 2.5	\$ 2.5
As-Needed Design Contract 19	\$ 2.5	\$ 2.5
<b>Total New Projects</b>	<b>\$ 54.5</b>	<b>\$ 10.2</b>

The largest project added is the Pump Station and CSO Facility Rehabilitation - \$45.0 million upgrades to DeLauri, Hingham, and Hough's Neck Pump Stations and the Somerville Marginal CSO Facility. At pump stations and CSO facilities, operability of mechanical equipment and maintenance of electric/standby power systems are key elements to minimize risk of facility failure.

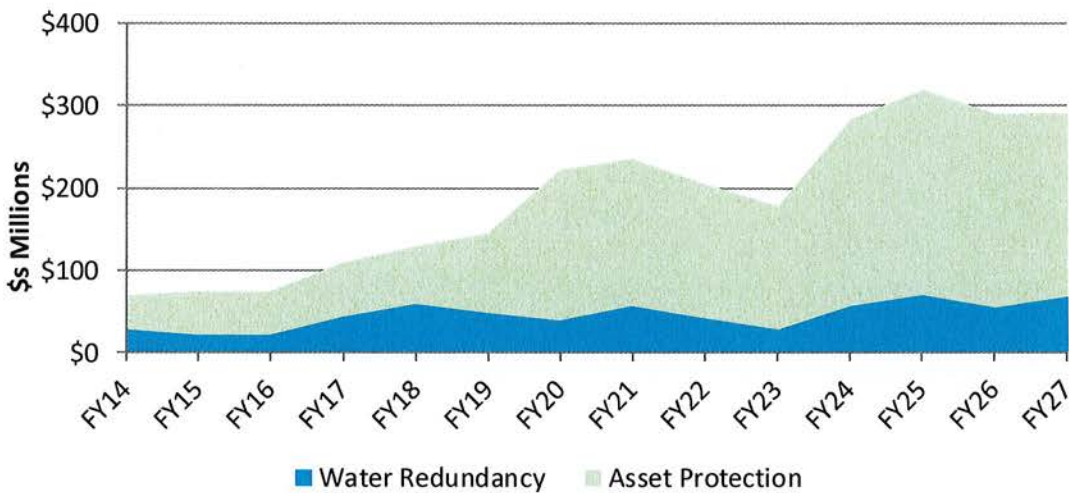
A complete list of new projects with cash flows and descriptions is attached as Attachment A.

In terms of utility spending, wastewater asset protection accounts for nearly 70% of the FY19-23 projected spending at \$666.6 million of which \$309.1 million is designated for the Deer Island Wastewater Treatment Plant and \$357.5 million for headworks and pipelines. The \$91.8 million targeted for waterworks includes over \$60.1 million for water pipeline.

### Asset Protection by Utility



As illustrated by the following graph, the next two waves of spending over the FY19-23 Cap period and the FY24-28 Cap period will be for asset protection and water redundancy. This reflects MWRA's commitment to maintaining its physical plant and addressing the need for water system redundancy in some critical service areas. Total asset protection spending for FY19-23 is projected at \$758.4 million or nearly 70% of projected spending. Similarly, water redundancy spending for FY19-23 is projected at \$213.2 million or 19.7% of projected FY19-23 spending.





## FY20 Proposed CIP Future Expenditures

The FY20 Proposed CIP contains future spending estimated at \$3.9 billion.

The table below represents the projected spending by the major project categories:

	FY19	FY20	FY21	FY22	FY23	Total FY19-23	Beyond 23
<b>Wastewater System Improvements</b>	<b>\$82.8</b>	<b>\$169.7</b>	<b>\$161.4</b>	<b>\$138.5</b>	<b>\$124.7</b>	<b>\$677.1</b>	<b>\$962.2</b>
Interception & Pumping	39.7	65.3	50.0	28.8	19.5	203.3	387.0
Treatment	12.1	66.4	80.6	80.7	77.3	317.2	418.9
Residuals	0.5	8.3	3.5	0.7	1.0	14.0	88.6
CSO	1.4	4.0	2.3	-	-	7.7	-
Other Wastewater	29.0	25.7	25.0	28.2	26.9	134.8	67.7
<b>Waterworks System Improvements</b>	<b>\$85.2</b>	<b>\$65.4</b>	<b>\$83.5</b>	<b>\$73.2</b>	<b>\$52.6</b>	<b>\$359.9</b>	<b>\$1,816.4</b>
Drinking Water Quality Improvements	1.8	3.1	3.6	3.4	1.3	13.2	41.4
Transmission	10.5	15.2	40.0	36.8	29.0	131.6	1,575.2
Distribution & Pumping	43.6	31.3	28.2	21.0	16.3	140.3	357.3
Other Waterworks	29.3	15.8	11.7	12.0	5.8	74.7	(157.4)
<b>Business &amp; Operations Support</b>	<b>6.4</b>	<b>14.7</b>	<b>13.9</b>	<b>7.1</b>	<b>5.0</b>	<b>47.0</b>	<b>15.6</b>
<b>Total MWRA</b>	<b>\$174.3</b>	<b>\$249.8</b>	<b>\$258.7</b>	<b>\$218.8</b>	<b>\$182.3</b>	<b>\$1,083.9</b>	<b>\$2,794.2</b>

**Major Planned Contract Awards for FY20:**

In Fiscal Year 2020, 54 contracts totaling \$182.5 million are projected to be awarded. The largest fifteen projected contract awards total \$145.7 million and account for nearly 80% of expected awards and are presented in the following table.

**Top 15 Contract Awards**

<b>Project</b>	<b>Subphase</b>	<b>Total Contract Amount (\$s in millions)</b>
Facility Asset Protection	Prison Point Rehab - Construction	\$36.3
DI Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	\$22.0
Metropolitan Redundancy Interim Improvements	WASM 3 CP-1	\$20.4
NIH Redundancy & Storage	Section 89 & 29 Replacement - Construction	\$16.0
Facility Asset Protection	Ward St & Columbus Park Headworks Design/CA	\$11.4
Metropolitan Tunnel Redundancy	Preliminary Design & MEPA Review	\$9.3
DI Treatment Plant Asset Protection	Digester & Storage Tank Rehab Design/ESDC	\$4.1
DI Treatment Plant Asset Protection	DI Dystor Membrane Replacements	\$4.0
Wastewater Meter System-Equipment	WW Metering Asset Protect/Equipment Purchase	\$4.0
Watershed Division Capital Improvements	Maintenance Garage/Wash Bay/Storage Building Construction	\$3.9
DI Treatment Plant Asset Protection	As-Needed REI - 1	\$3.0
Metropolitan Redundancy Interim Improvements	Section 101/Waltham Design/CA	\$3.0
DI Treatment Plant Asset Protection	As-Needed Design 9-1	\$2.8
DI Treatment Plant Asset Protection	As-Needed Design 9-2	\$2.8
DI Treatment Plant Asset Protection	As-Needed Design 9-3	\$2.8
<b>Total</b>		<b>\$145.7</b>

## **CIP Review and Adoption Process**

The Advisory Board will have 60 days from the transmittal of the FY20 Proposed CIP to review the budget and prepare comments and recommendations. During the review period, Advisory Board and MWRA staff will continue to meet and discuss the changes to the capital budget. The Advisory Board will then transmit its comments and recommendations to MWRA in the spring after its review. Staff will prepare draft responses to the Advisory Board's recommendations for discussion at the budget hearing. During the spring, MWRA will update the CIP to incorporate the latest information into the Final budget. In June, staff will present the FY20 Final to the Board for adoption.

### **ATTACHMENTS:**

- A. New Capital Projects Added to the FY20 Proposed CIP
- B. FY20 Proposed Project Level Expenditure Forecast
- C. Overview of the FY20 Proposed CIP and Changes from the FY19 Final CIP

**ATTACHMENT A**  
**New Capital Projects Added to the FY20 Proposed CIP**

Program	Project	Subphase	Contract Number	Total Contract Amount	NTP	SC	FY19	FY20	FY21	FY22	FY23	FY19-23	Beyond FY23	Total Expenditures
Interception & Pumping	Facility Asset Protection	Section 191 & 192 Charles River Valley Sewer	7643	\$ 500,000	May-19	Oct-19		\$ 500,000				\$ 500,000	\$ -	\$ 500,000
Interception & Pumping	Facility Asset Protection	Pump Stations & CSO Facility Rehab Design/CA/REI	7689	\$ 7,500,000	Nov-21	Nov-31				\$ 150,000	\$ 500,000	\$ 650,000	\$ 6,850,000	\$ 7,500,000
Interception & Pumping		Pump Stations & CSO Facility Rehab Construction	7688	\$ 37,500,000	Nov-23	Nov-30						\$ -	\$ 37,500,000	\$ 37,500,000
Treatment	DITP Asset Protection	As-Needed REI	7647	\$ 3,000,000	Jul-19	Jul-21		\$ 731,250	\$ 1,275,000	\$ 993,750		\$ 3,000,000		\$ 3,000,000
Treatment	Clinton Wastewater Treatment Plant	Equipment & Supplies Storage Building	7693	\$ 292,589	Sep-19	Dec-20		\$ 157,009	\$ 135,580			\$ 292,589		\$ 292,589
Drinking Water Quality Improvements	Carroll Water Treatment Asset Protection	CWTP Emergency Generator #1 Replacement (Electric Portion)	7642	\$ 750,000	Jan-19	Aug-19	281,000	\$469,000				\$ 750,000		\$ 750,000
Business & Operations Support	Capital Maintenance Planning & Support	As-Needed Design Contract 18	7691	\$ 2,500,000	Jul-20	Jul-22			900,000	1,200,000	400,000	\$ 2,500,000		\$ 2,500,000
Business & Operations Support	Capital Maintenance Planning & Support	As-Needed Design Contract 19	7692	\$ 2,500,000	Jul-20	Jul-22			900,000	1,200,000	400,000	\$ 2,500,000		\$ 2,500,000
<b>SUMMARY:</b>														
<b>Total Wastewater Projects</b>				\$ 48,792,589			\$ -	\$ 1,388,259	\$ 1,410,580	\$ 1,143,750	\$ 500,000	\$ 4,442,589	\$44,350,000	\$ 48,792,589
<b>Total Waterworks Projects</b>				\$ 750,000			\$ 281,000	\$ 469,000	\$ -	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000
<b>Business &amp; Operations Support</b>				\$ 5,000,000			\$ -	\$ -	\$ 1,800,000	\$ 2,400,000	\$ 800,000	\$ 5,000,000	\$ -	\$ 5,000,000
<b>Total Projects</b>				\$ 54,542,589			\$ 281,000	\$ 1,857,259	\$ 3,210,580	\$ 3,543,750	\$ 1,300,000	\$ 10,192,589	\$44,350,000	\$ 54,542,589



**ATTACHMENT B**  
**FY20 Proposed CIP**  
**Expenditure Forecast at Project Level**

Program / Project	Total Contract Amount	Payments through FY18	Remaining Balance	FY19	FY20	FY21	FY22	FY23	FY19-FY23	FY24-FY28	Beyond FY28
<b>Total MWRA</b>	<b>8,151,873,364</b>	<b>4,273,762,304</b>	<b>3,878,111,060</b>	<b>174,333,281</b>	<b>249,801,950</b>	<b>258,700,059</b>	<b>218,756,210</b>	<b>182,332,747</b>	<b>1,083,924,249</b>	<b>1,578,394,290</b>	<b>1,215,792,452</b>
<b>Wastewater</b>	<b>3,700,571,273</b>	<b>2,061,317,110</b>	<b>1,639,254,163</b>	<b>82,761,348</b>	<b>169,696,888</b>	<b>161,382,659</b>	<b>138,482,031</b>	<b>124,732,035</b>	<b>677,054,961</b>	<b>855,910,165</b>	<b>106,289,015</b>
<b>Interception &amp; Pumping</b>	<b>1,192,713,929</b>	<b>602,400,132</b>	<b>590,313,797</b>	<b>39,678,011</b>	<b>65,280,018</b>	<b>50,015,767</b>	<b>28,838,263</b>	<b>19,521,447</b>	<b>203,333,506</b>	<b>331,873,087</b>	<b>55,107,202</b>
102 Quincy Pump Facilities	25,907,202	25,907,202	-								
104 Braintree-Weymouth Relief Facilities	240,104,662	227,704,621	12,400,041	173,764	417,034	417,034	417,034	417,034	1,841,900	10,558,140	
105 New Neponset Valley Relief Sewer	30,300,303	30,300,303	-								
106 Wellesley Extension Replacement Sewer	64,358,543	64,358,543	-								
107 Framingham Extension Relief Sewer	47,855,986	47,855,986	-								
127 Cummingsville Replacement Sewer	8,998,768	8,998,767	-								
130 Siphon Structure Rehabilitation	12,126,790	939,770	11,187,020	60,000	460,000	978,700	3,185,000	884,560	5,568,260	5,618,760	
131 Upper Neponset Valley Sewer System	54,174,078	54,174,078	-								
132 Corrosion & Odor Control	79,016,774	6,179,941	72,836,833	966,687	10,749,471	12,246,595	12,246,595	4,725,898	40,935,246	31,061,587	840,000
136 West Roxbury Tunnel	11,313,573	10,313,573	1,000,000							1,000,000	
137 Wastewater Central Monitoring	27,482,036	19,782,036	7,700,000	371,295	348,705	447,000	447,000	447,000	2,061,000	5,639,000	
139 South System Relief Project	4,939,244	3,439,244	1,500,000							1,500,000	
141 Wastewater Process Optimization	10,337,323	1,501,768	8,835,556							5,116,533	3,719,023
142 Wastewater Meter System - Equipment Replacement	28,332,912	5,724,367	22,608,545	1,812,610	4,318,233	3,307,377	3,970,264	258,215	13,666,699		8,941,846
143 Regional I/I Management Planning	168,987	168,987	-								
145 Facility Asset Protection	541,599,247	95,050,945	446,548,303	36,293,654	48,986,575	32,357,498	8,223,620	12,701,553	138,562,901	266,379,067	41,606,333
146 D.I. Cross Harbor Tunnel	5,000,000	-	5,000,000							5,000,000	
147 Randolph Trunk Sewer Relief	697,500	-	697,500			261,563	348,750	87,187	697,500		

**ATTACHMENT B**  
**FY20 Proposed CIP**  
**Expenditure Forecast at Project Level**

Program / Project	Total Contract Amount	Payments through FY18	Remaining Balance	FY19	FY20	FY21	FY22	FY23	FY19-FY23	FY24-FY28	Beyond FY28
<b>Treatment</b>	<b>1,037,227,592</b>	<b>301,156,788</b>	<b>736,070,804</b>	<b>12,129,232</b>	<b>66,418,532</b>	<b>80,566,870</b>	<b>80,726,953</b>	<b>77,317,529</b>	<b>317,159,115</b>	<b>371,902,273</b>	<b>47,009,415</b>
182 DI Primary and Secondary Treatment	(957,878)	(957,878)	-								
200 DI Plant Optimization	33,278,599	33,278,599	-								
206 DI Treatment Plant Asset Protection	975,832,759	252,359,436	723,473,323	10,548,634	64,509,523	79,072,290	79,347,918	75,656,564	309,134,928	367,328,978	47,009,415
210 Clinton Wastewater Treatment Plant	26,862,438	14,264,956	12,597,482	1,580,598	1,909,009	1,494,580	1,379,035	1,660,965	8,024,187	4,573,295	
211 Laboratory Services	2,211,674	2,211,674	-								
<b>Residuals</b>	<b>167,642,622</b>	<b>65,047,023</b>	<b>102,595,600</b>	<b>488,000</b>	<b>8,316,398</b>	<b>3,491,369</b>	<b>717,556</b>	<b>995,333</b>	<b>14,008,656</b>	<b>31,677,204</b>	<b>56,909,740</b>
261 Residuals	63,810,848	63,810,848	-								
271 Residuals Asset Protection	103,831,775	1,236,175	102,595,600	488,000	8,316,398	3,491,369	717,556	995,333	14,008,656	31,677,204	56,909,740
<b>CSO</b>											
<b>MWRA Managed</b>	<b>433,534,309</b>	<b>433,534,309</b>	<b>-</b>								
339 North Dorchester Bay	221,509,794	221,509,794	-								
347 East Boston Branch Sewer Relief	85,637,164	85,637,164	-								
348 BOS019 Storage Conduit	14,287,581	14,287,581	-								
349 Chelsea Trunk Sewer	29,779,319	29,779,319	-								
350 Union Park Detention Treatment Facility	49,583,406	49,583,406	-								
353 Upgrade Existing CSO Facilities	22,385,200	22,385,200	-								
354 Hydraulic Relief Projects	2,294,549	2,294,549	-								
355 MWR003 Gate & Siphon	4,424,219	4,424,219	-								
357 Charles River CSO Controls	3,633,077	3,633,077	-								

**ATTACHMENT B  
FY20 Proposed CIP  
Expenditure Forecast at Project Level**

Program / Project	Total Contract Amount	Payments through FY18	Remaining Balance	FY19	FY20	FY21	FY22	FY23	FY19-FY23	FY24-FY28	Beyond FY28
<b>Community Managed</b>	<b>423,780,126</b>	<b>420,017,055</b>	<b>3,763,070</b>		<b>1,881,527</b>	<b>1,881,527</b>			<b>3,763,054</b>		
340 Dorchester Bay Sewer Separation (Fox Point)	55,028,985	55,028,985	-								
341 Dorchester Bay Sewer Separation (Commercial Point)	63,624,695	59,861,640	3,763,055		1,881,527	1,881,527			3,763,054		
342 Neponset River Sewer Separation	2,491,746	2,491,746	-								
343 Constitution Beach Sewer Separation	3,731,315	3,731,315	-								
344 Stony Brook Sewer Separation	44,319,314	44,319,314	-								
346 Cambridge Sewer Separation	104,552,056	104,552,056	-								
351 BWSC Floatables Controls	945,936	945,936	-								
352 Cambridge Floatables Controls	1,126,708	1,126,708	-								
356 Fort Point Channel Sewer Separation	11,507,257	11,507,257	-								
358 Morrissey Boulevard Drain	32,181,035	32,181,035	-								
359 Reserved Channel Sewer Separation	70,524,212	70,524,212	-								
360 Brookline Sewer Separation	24,715,291	24,715,291	-								
361 Bulfinch Triangle Sewer Separation	9,031,576	9,031,576	-								
<b>CSO Planning &amp; Support</b>	<b>52,806,834</b>	<b>48,845,051</b>	<b>3,961,783</b>	<b>1,417,746</b>	<b>2,100,500</b>	<b>443,537</b>			<b>3,961,783</b>		
324 CSO Support	52,806,834	48,845,051	3,961,783	1,417,746	2,100,500	443,537			3,961,783		
<b>Other Wastewater</b>	<b>392,865,861</b>	<b>190,316,754</b>	<b>202,549,107</b>	<b>29,048,359</b>	<b>25,699,913</b>	<b>24,983,589</b>	<b>28,199,260</b>	<b>26,897,727</b>	<b>134,828,847</b>	<b>120,457,601</b>	<b>(52,737,342)</b>
128 I/I Local Financial Assistance	392,584,985	190,035,878	202,549,107	29,048,359	25,699,913	24,983,589	28,199,260	26,897,727	134,828,847	120,457,601	(52,737,342)
138 Sewerage System Mapping Upgrades	280,876	280,876	-								



**ATTACHMENT B  
FY20 Proposed CIP  
Expenditure Forecast at Project Level**

Program / Project	Total Contract Amount	Payments through FY18	Remaining Balance	FY19	FY20	FY21	FY22	FY23	FY19-FY23	FY24-FY28	Beyond FY28
<b>Waterworks</b>	<b>4,287,690,928</b>	<b>2,111,415,257</b>	<b>2,176,275,671</b>	<b>85,194,527</b>	<b>65,434,170</b>	<b>83,467,029</b>	<b>73,203,679</b>	<b>52,561,768</b>	<b>359,861,173</b>	<b>706,911,016</b>	<b>1,109,503,437</b>
<b>Drinking Water Quality Improvements</b>	<b>704,555,418</b>	<b>649,972,373</b>	<b>54,583,044</b>	<b>1,755,219</b>	<b>3,112,000</b>	<b>3,574,810</b>	<b>3,399,000</b>	<b>1,346,000</b>	<b>13,187,029</b>	<b>13,125,000</b>	<b>28,271,000</b>
542 Carroll Water Treatment Plant	436,157,451	423,116,424	13,041,027	1,473,219	2,082,000	235,810			3,791,029	9,250,000	
543 Brutsch Water Treatment Facility	19,972,883	19,972,883	-								
544 Norumbega Covered Storage	106,674,146	106,674,146	-								
545 Blue Hills Covered Storage	40,082,837	40,082,837	-								
550 Spot Pond Covered Storage Facility	60,127,101	60,126,087	1,014	1,000					1,000		
555 CWTP Asset Protection	41,541,000	-	41,541,000	281,000	1,030,000	3,339,000	3,399,000	1,346,000	9,395,000	3,875,000	28,271,000
<b>Transmission</b>	<b>2,531,999,434</b>	<b>825,200,270</b>	<b>1,706,799,165</b>	<b>10,527,310</b>	<b>15,237,688</b>	<b>40,014,486</b>	<b>36,840,500</b>	<b>29,028,246</b>	<b>131,648,230</b>	<b>357,860,447</b>	<b>1,217,290,467</b>
597 Winsor Station Pipeline Improvements	49,674,844	5,733,885	43,940,959	319,360					319,360	42,969,086	652,500
601 Sluice Gate Rehabilitation	9,158,411	9,158,411	-								
604 MetroWest Tunnel	700,184,180	697,182,355	3,001,825							3,001,822	
615 Chicopee Valley Aqueduct Redundancy	8,666,292	8,666,292	-								
616 Quabbin Transmission System	17,119,694	8,666,844	8,452,850	3,357		880,000	2,037,000	2,687,000	5,607,357	2,820,493	25,000
617 Sudbury/Weston Aqueduct Repairs	10,174,064	2,231,727	7,942,336	385,456	575,000	494,500			1,454,956	5,820,380	667,000
620 Wachusett Reservoir Spillway Improvements	9,287,460	9,287,460	-								
621 Watershed Land	29,000,000	22,846,400	6,153,600	845,000	905,000	1,000,000	1,000,000	1,000,000	4,750,000	1,403,600	
622 Cosgrove Tunnel Redundancy	58,272,518	52,017,895	6,254,623	5,649,925	517,177	87,522			6,254,624		
623 Dam Projects	5,916,316	3,115,745	2,800,571		97,566	740,000	1,299,000	621,000	2,757,566	43,000	
625 Metropolitan Tunnel Redundancy	1,421,750,796	3,455,967	1,418,294,829	14,005	1,508,000	4,512,000	4,512,000	4,512,000	15,058,005	187,389,287	1,215,847,536
628 Metropolitan Redundancy Interim Improvements	192,894,859	2,837,288	190,057,571	3,310,206	11,277,945	29,914,464	25,125,500	18,808,246	88,436,361	101,522,779	98,431
630 Watershed Division Capital Improvements	19,900,000	-	19,900,000		357,000	2,386,000	2,867,000	1,400,000	7,010,000	12,890,000	

**ATTACHMENT B  
FY20 Proposed CIP  
Expenditure Forecast at Project Level**

Program / Project	Total Contract Amount	Payments through FY18	Remaining Balance	FY19	FY20	FY21	FY22	FY23	FY19-FY23	FY24-FY28	Beyond FY28
<b>Distribution And Pumping</b>	<b>961,957,344</b>	<b>464,357,486</b>	<b>497,599,858</b>	<b>43,576,757</b>	<b>31,265,836</b>	<b>28,198,789</b>	<b>20,951,252</b>	<b>16,340,183</b>	<b>140,332,818</b>	<b>298,591,191</b>	<b>58,675,843</b>
618 Peabody Pipeline Project	3,508,857	1,059,081	2,449,776	369,866		1,631,545	448,365		2,449,776		
677 Valve Replacement	21,654,808	12,016,378	9,638,430							6,487,202	3,151,224
678 Boston Low Service - Pipe & Valve Rehabilitation	23,690,864	23,690,863	-								
683 Heath Hill Road Pipe Replacement	19,358,036	19,358,036	-								
689 James L. Gillis Pump Station	33,419,006	33,419,007	-								
692 Northern High Service (NHS) - Section 27 Improvement	1,325,638	123,646	1,201,992	713	1,238	750	12,150	12,150	27,001	1,174,992	
693 NHS - Revere & Malden Pipeline Improvements	79,527,068	28,561,307	50,965,761	815,095	2,062,797	1,111,617	902,000	1,147,057	6,038,566	43,029,195	1,898,000
702 New Connecting Mains - Shaft 7 to WASM 3	54,124,444	12,924,613	41,199,831	1,322,437	7,121,552	7,326,115	2,869,395	4,077,000	22,716,499	18,483,331	
704 Rehabilitation of Other Pump Stations	50,257,852	30,057,852	20,200,000		180,000	240,000	244,167	656,667	1,320,834	18,879,166	
706 NHS - New Connecting Mains from Section 91	2,360,194	2,360,194	-								
708 Northern Extra High Service - New Pipelines	10,874,080	3,632,119	7,241,961	9,996	12,699	1,950	107,488	315,000	447,133	6,794,828	
712 Cathodic Protection of Distribution Mains	66,704,129	269,629	66,434,500	500,000	579,500	1,481,860	3,284,000	5,121,250	10,966,610	55,467,890	
713 Spot Pond Supply Mains Rehabilitation	66,332,803	65,489,308	843,495	43,495			600,000	200,000	843,495		
714 Southern Extra High - Sections 41 & 42	3,657,243	3,657,243	-								
719 Chestnut Hill Connecting Mains	33,826,925	18,286,518	15,540,407							15,534,407	6,000
720 Warren Cottage Line Rehabilitation	1,204,822	1,204,821	-								
721 Southern Spine Distribution Mains	78,707,734	36,683,101	42,024,633	52,191	624,381	624,381	360,596	508,449	2,169,998	39,745,884	108,752
722 NIH Redundancy & Storage	120,365,538	48,895,156	71,470,382	17,726,895	6,622,623	12,020,515	7,623,625	250,000	44,243,657	27,215,264	11,459
723 Northern Low Service Rehabilitation - Section 8	56,684,416	2,954,615	53,729,802	1,974,927	1,639,107	1,311,600	3,737,266	3,289,600	11,952,500	40,980,812	796,491
725 Hydraulic Model Update	598,358	598,358	-								

**ATTACHMENT B**  
**FY20 Proposed CIP**  
**Expenditure Forecast at Project Level**

Program / Project	Total Contract Amount	Payments through FY18	Remaining Balance	FY19	FY20	FY21	FY22	FY23	FY19-FY23	FY24-FY28	Beyond FY28
727 SEH Redundancy & Storage	131,416,155	28,444,812	102,971,342	20,700,426	12,418,690	2,447,331	461,075	363,000	36,390,522	13,876,902	52,703,917
730 Weston Aqueduct Supply Mains	80,463,695	80,402,975	60,720	60,718					60,718		
731 Lynnfield Pipeline	5,625,829	5,625,829	-								
732 Walnut St. & Fisher Hill Pipeline Rehabilitation	2,717,140	2,717,140	-								
735 Section 80 Rehabilitation	13,551,711	1,924,884	11,626,828		3,250	1,125	301,125	400,010	705,510	10,921,318	
<b>Other Waterworks</b>	<b>89,178,732</b>	<b>171,885,128</b>	<b>(82,706,396)</b>	<b>29,335,241</b>	<b>15,818,646</b>	<b>11,678,944</b>	<b>12,012,927</b>	<b>5,847,339</b>	<b>74,693,097</b>	<b>37,334,379</b>	<b>(194,733,873)</b>
753 Central Monitoring System	39,017,210	20,704,576	18,312,634	416,277	975,000	3,950,000	2,700,000	1,625,000	9,666,277	5,576,000	3,070,356
763 Distribution System Facilities Mapping	2,798,919	1,036,368	1,762,551		269,000	577,000	337,000	366,000	1,549,000	213,551	
764 Local Water Infrastructure Rehabilitation	7,487,762	7,487,762	-								
765 Local Water Pipeline Assistance Program	-	140,273,212	(140,273,212)	22,399,751	9,697,681	5,186,305	4,421,927	(4,207,815)	37,497,849	20,033,168	(197,804,229)
766 Waterworks Facilities Asset Protection	39,874,840	2,383,210	37,491,631	6,519,213	4,876,965	1,965,639	4,554,000	8,064,154	25,979,971	11,511,660	
<b>Business &amp; Operations Support</b>	<b>163,611,163</b>	<b>101,029,937</b>	<b>62,581,226</b>	<b>6,377,407</b>	<b>14,670,892</b>	<b>13,850,372</b>	<b>7,070,500</b>	<b>5,038,944</b>	<b>47,008,114</b>	<b>15,573,109</b>	
881 Equipment Purchase	38,706,221	21,856,910	16,849,311	2,038,809	1,743,000	1,432,500	1,772,500	3,082,500	10,069,309	6,780,000	
925 Technical Assistance	1,100,000	-	1,100,000		366,000	366,000	368,000		1,100,000		
930 MWRA Facility - Chelsea	9,812,071	9,812,071	-								
931 Business Systems Plan	24,562,604	24,562,603	-								
932 Environmental Remediation	1,478,602	1,478,602	-								
933 Capital Maintenance Planning & Development	28,161,817	14,200,661	13,961,155	3,240,142	3,437,000	3,596,014	2,888,000	800,000	13,961,156		
934 MWRA Facilities Management	2,870,535	370,533	2,500,002		300,000	1,276,000	924,000		2,500,000		
935 Alternative Energy Initiatives	23,598,121	18,417,564	5,180,557							5,180,552	
940 Application Improvement Program	11,412,732	2,892,131	8,520,601	679,252	1,733,228	1,063,125	600,000	984,444	5,060,049	3,460,557	

**ATTACHMENT B  
 FY20 Proposed CIP  
 Expenditure Forecast at Project Level**

<b>Program / Project</b>	<b>Total Contract Amount</b>	<b>Payments through FY18</b>	<b>Remaining Balance</b>	<b>FY19</b>	<b>FY20</b>	<b>FY21</b>	<b>FY22</b>	<b>FY23</b>	<b>FY19-FY23</b>	<b>FY24-FY28</b>	<b>Beyond FY28</b>
942 Information Security Program (ISP)	5,506,323	1,707,904	3,798,418	47,205	1,087,343	2,663,871			3,798,418		
944 Information Technology Management Program	200,000	-	200,000	200,000					200,000		
946 IT Infrastructure Program	16,202,138	5,730,957	10,471,181	172,000	6,004,321	3,452,862	518,000	172,000	10,319,183	152,000	



**ATTACHMENT C**  
**Overview of the FY20 Proposed CIP and Changes from the Final FY19 CIP**

Program and Project	FY19 Final			
	Total Budget Amount	FY14-18	FY19-23	Beyond 23
<b>Total MWRA</b>	<b>8,009,088</b>	<b>595,622</b>	<b>1,051,829</b>	<b>2,673,508</b>
<b>Wastewater</b>	<b>3,603,553</b>	<b>334,086</b>	<b>643,200</b>	<b>890,263</b>
<b>Interception &amp; Pumping</b>	<b>1,115,506</b>	<b>83,504</b>	<b>188,703</b>	<b>322,759</b>
102 Quincy Pump Facilities	25,907	-	-	-
104 Braintree-Weymouth Relief Facilities	239,378	1	1,814	9,859
105 New Neponset Valley Relief Sewer	30,300	-	-	-
106 Wellesley Extension Replacement Sewer	64,359	-	-	-
107 Framingham Extension Relief Sewer	47,856	-	-	-
127 Cummingsville Replacement Sewer	8,999	-	-	-
130 Siphon Structure Rehabilitation	6,168	-	5,228	-
131 Upper Neponset Valley Sewer	54,174	-	-	-
132 Corrosion & Odor Control	76,754	2,947	41,502	29,304
136 West Roxbury Tunnel	11,314	-	-	1,000
137 Wastewater Central Monitoring	27,482	-	2,200	5,500
139 South System Relief Project	4,939	-	-	1,500
141 Wastewater Process Optimization	10,306	297	-	8,804
142 Wastewater Meter System-Equipment	28,733	974	13,679	8,942
143 Regional I/I Management Planning	169	-	-	-
145 Facility Asset Protection	472,970	79,285	123,582	252,850
146 D.I. Cross Harbor Tunnel Inspection	5,000	-	-	5,000
147 Randolph Trunk Sewer Relief	698	-	698	-
<b>Treatment</b>	<b>1,017,420</b>	<b>117,772</b>	<b>312,076</b>	<b>402,848</b>
182 DI Primary and Secondary	(958)	-	-	-
200 DI Plant Optimization	33,279	(148)	-	-
206 DI Treatment Plant Asset Protection	956,523	105,912	305,312	397,798
210 Clinton Wastewater Treat Plant	26,364	12,024	6,764	5,051
211 Laboratory Services	2,212	(16)	-	-
<b>Residuals</b>	<b>167,643</b>	<b>675</b>	<b>11,487</b>	<b>90,945</b>
261 Residuals	63,811	-	-	-
271 Residuals Asset Protection	103,832	675	11,487	90,945

FY20 Proposed			
Total Budget Amount	FY14-18	FY19-23	Beyond 23
<b>8,151,875</b>	<b>585,638</b>	<b>1,083,923</b>	<b>2,794,187</b>
<b>3,700,573</b>	<b>325,315</b>	<b>677,055</b>	<b>962,199</b>
<b>1,192,715</b>	<b>81,861</b>	<b>203,334</b>	<b>386,981</b>
25,907	-	-	-
240,105	1	1,842	10,558
30,300	-	-	-
64,359	-	-	-
47,856	-	-	-
8,999	-	-	-
12,127	-	5,568	5,619
54,174	-	-	-
79,017	3,179	40,935	31,902
11,314	-	-	1,000
27,482	-	2,061	5,639
4,939	-	-	1,500
10,337	297	-	8,836
28,333	586	13,667	8,942
169	-	-	-
541,599	77,798	138,563	307,985
5,000	-	-	5,000
698	-	698	-
<b>1,037,228</b>	<b>116,434</b>	<b>317,159</b>	<b>418,910</b>
(958)	-	-	-
33,279	(148)	-	-
975,833	104,859	309,135	414,338
26,862	11,739	8,024	4,573
2,212	(16)	-	-
<b>167,643</b>	<b>511</b>	<b>14,009</b>	<b>88,587</b>
63,811	-	-	-
103,832	511	14,009	88,587

Change from Final FY19			
Total Budget Amount	FY14-18	FY19-23	Beyond 23
<b>142,037</b>	<b>(9,984)</b>	<b>27,440</b>	<b>124,583</b>
<b>97,020</b>	<b>(8,771)</b>	<b>33,855</b>	<b>71,936</b>
<b>77,209</b>	<b>(1,643)</b>	<b>14,631</b>	<b>64,222</b>
-	-	-	-
727	-	28	699
-	-	-	-
-	-	-	-
-	-	-	-
5,959	-	340	5,619
-	-	-	-
2,263	232	(567)	2,598
-	-	-	-
-	-	(139)	139
-	-	-	-
31	-	-	32
(400)	(388)	(12)	-
-	-	-	-
68,629	(1,487)	14,981	55,135
-	-	-	-
-	-	-	-
<b>19,808</b>	<b>(1,338)</b>	<b>5,083</b>	<b>16,062</b>
-	-	-	-
-	-	-	-
19,310	(1,053)	3,823	16,540
498	(285)	1,260	(478)
-	-	-	-
-	(164)	2,522	(2,358)
-	-	-	-
-	(164)	2,522	(2,358)

**ATTACHMENT C**  
**Overview of the FY20 Proposed CIP and Changes from the Final FY19 CIP**

Program and Project	FY19 Final				FY20 Proposed				Change from Final FY19			
	Total Budget Amount	FY14-18	FY19-23	Beyond 23	Total Budget Amount	FY14-18	FY19-23	Beyond 23	Total Budget Amount	FY14-18	FY19-23	Beyond 23
<b>CSO</b>	<b>910,118</b>	<b>64,699</b>	<b>7,711</b>	<b>-</b>	<b>910,121</b>	<b>64,688</b>	<b>7,724</b>	<b>-</b>	<b>3</b>	<b>(11)</b>	<b>13</b>	<b>-</b>
340 Dorchester Bay Sewer Separation (Fox Point)	55,029	877	-	-	55,029	877	-	-	-	-	-	-
341 Dorchester Bay Sewer Separation (Commercial Point)	63,619	(1,286)	3,758	-	63,625	(1,286)	3,763	-	6	-	5	-
342 Neponset River Sewer Separation	2,492	47	-	-	2,492	47	-	-	-	-	-	-
343 Constitution Beach Sewer Separation	3,731	(38)	-	-	3,731	(38)	-	-	-	-	-	-
344 Stony Brook Sewer Separation	44,319	121	-	-	44,319	121	-	-	-	-	-	-
346 Cambridge Sewer Separation	104,552	54,068	-	-	104,552	54,068	-	-	-	-	-	-
351 BWSC Floatables Controls	946	13	-	-	946	13	-	-	-	-	-	-
352 Cambridge Floatables Control	1,127	40	-	-	1,127	40	-	-	-	-	-	-
356 Fort Point Channel Sewer Separation	11,507	(499)	-	-	11,507	(499)	-	-	-	-	-	-
358 Morrissey Boulevard Drain	32,181	(166)	-	-	32,181	(166)	-	-	-	-	-	-
359 Reserved Channel Sewer Separation	70,524	10,484	-	-	70,524	10,484	-	-	-	-	-	-
360 Brookline Sewer Separation	24,715	(1,282)	-	-	24,715	(1,282)	-	-	-	-	-	-
361 Bulfinch Triangle Sewer Separation	9,032	(826)	-	-	9,032	(826)	-	-	-	-	-	-
339 North Dorchester Bay	221,510	(111)	-	-	221,510	(111)	-	-	-	-	-	-
347 East Boston Branch Sewer Relief	85,637	(9)	-	-	85,637	(9)	-	-	-	-	-	-
348 BOS019 Storage Conduit	14,288	-	-	-	14,288	-	-	-	-	-	-	-
349 Chelsea Trunk Sewer	29,779	-	-	-	29,779	-	-	-	-	-	-	-
350 Union Park Detention Treatment Facility	49,583	-	-	-	49,583	-	-	-	-	-	-	-
353 Upgrade Existing CSO Facilities	22,385	-	-	-	22,385	-	-	-	-	-	-	-
354 Hydraulic Relief Projects	2,295	-	-	-	2,295	-	-	-	-	-	-	-
355 MWR003 Gate & Siphon	4,424	3,775	-	-	4,424	3,775	-	-	-	-	-	-
357 Charles River CSO Controls	3,633	-	-	-	3,633	-	-	-	-	-	-	-
324 CSO Support	52,810	(508)	3,954	-	52,807	(519)	3,962	-	(3)	(11)	8	-
<b>Other Wastewater</b>	<b>392,866</b>	<b>67,436</b>	<b>123,223</b>	<b>73,711</b>	<b>392,866</b>	<b>61,821</b>	<b>134,829</b>	<b>67,721</b>	<b>-</b>	<b>(5,615)</b>	<b>11,606</b>	<b>(5,990)</b>
128 I/I Local Financial Assistance	392,585	67,436	123,223	73,711	392,585	61,821	134,829	67,721	-	(5,615)	11,606	(5,990)
138 Sewerage System Mapping Upgrade	281	-	-	-	281	-	-	-	-	-	-	-
<b>Total Waterworks</b>	<b>4,253,659</b>	<b>237,374</b>	<b>370,062</b>	<b>1,771,547</b>	<b>4,287,692</b>	<b>236,734</b>	<b>359,865</b>	<b>1,816,417</b>	<b>33,283</b>	<b>(640)</b>	<b>(14,851)</b>	<b>48,774</b>
<b>Drinking Water Quality</b>	<b>703,468</b>	<b>54,845</b>	<b>8,115</b>	<b>45,300</b>	<b>704,555</b>	<b>54,765</b>	<b>13,187</b>	<b>41,396</b>	<b>337</b>	<b>(80)</b>	<b>418</b>	<b>-</b>
542 Carroll Water Treatment Plant	435,675	11,842	3,374	9,250	436,157	11,908	3,791	9,250	482	66	417	-
543 Quabbin Water Treatment Plant	19,973	7,205	-	-	19,973	7,205	-	-	-	-	-	-
544 Norumbega Covered Storage	106,674	-	-	-	106,674	-	-	-	-	-	-	-
545 Blue Hills Covered Storage	40,083	120	-	-	40,083	120	-	-	-	-	-	-
550 Spot Pond Storage Facility	60,272	35,678	-	-	60,127	35,532	1	-	(145)	(146)	1	-
555 CWTP Asset Protection	40,791	0	4,741	36,050	41,541	-	9,395	32,146	750	-	4,654	(3,904)

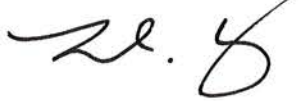
**ATTACHMENT C**  
**Overview of the FY20 Proposed CIP and Changes from the Final FY19 CIP**

Program and Project	FY19 Final				FY20 Proposed				Change from Final FY19			
	Total Budget Amount	FY14-18	FY19-23	Beyond 23	Total Budget Amount	FY14-18	FY19-23	Beyond 23	Total Budget Amount	FY14-18	FY19-23	Beyond 23
<b>Transmission</b>	<b>2,494,174</b>	<b>70,511</b>	<b>129,441</b>	<b>1,539,191</b>	<b>2,532,001</b>	<b>70,164</b>	<b>131,650</b>	<b>1,575,153</b>	<b>37,827</b>	<b>(347)</b>	<b>2,209</b>	<b>35,962</b>
597 Winsor Station Pipeline	48,640	4,505	149	42,591	49,675	4,338	319	43,622	1,035	(167)	170	1,031
601 Sluice Gate Rehabilitation	9,158	-	-	-	9,158	-	-	-	-	-	-	-
604 MetroWest Tunnel	700,184	1,784	-	3,002	700,184	1,784	-	3,002	-	-	-	-
615 Chicopee Valley Aqueduct Redundancy	8,666	-	-	-	8,666	-	-	-	-	-	-	-
616 Quabbin Transmission System	17,120	1,464	1,865	6,588	17,120	1,464	5,607	2,845	-	-	3,742	(3,743)
617 Sudbury/Weston Aqueduct Repairs	10,288	2,069	1,085	6,475	10,174	1,572	1,455	6,487	(114)	(497)	370	12
620 Wachusett Reservoir Spillway Improvement	9,287	-	-	-	9,287	-	-	-	-	-	-	-
621 Watershed Land	29,000	5,254	5,000	1,404	29,000	5,504	4,750	1,404	-	250	(250)	-
622 Cosgrove/Wachusett Redundancy	57,495	50,746	5,574	-	58,273	50,842	6,255	-	778	96	681	-
623 Dam Projects	5,726	31	2,392	218	5,916	31	2,758	43	190	-	366	(175)
625 Metro Tunnel Redundancy	1,387,910	1,790	14,483	1,369,970	1,421,751	1,790	15,058	1,403,237	33,841	-	575	33,267
628 Metro Redundancy Interim Improvement	192,698	2,566	94,081	96,051	192,895	2,837	88,436	101,621	197	271	(5,645)	5,570
630 Watershed Division Capital Improvement	18,000	300	4,810	12,890	19,900	-	7,010	12,890	1,900	(300)	2,200	-
<b>Distribution &amp; Pumping</b>	<b>965,831</b>	<b>90,418</b>	<b>159,644</b>	<b>343,064</b>	<b>961,957</b>	<b>91,654</b>	<b>140,335</b>	<b>357,265</b>	<b>(3,874)</b>	<b>1,236</b>	<b>(19,309)</b>	<b>14,201</b>
618 Peabody Pipeline	18,668	1,163	17,504	-	3,509	1,059	2,450	-	(15,159)	(104)	(15,054)	-
677 Valve Replacement	21,402	-	-	9,385	21,655	-	-	9,638	253	-	-	253
678 Boston Low Service-Pipe & Valve Rehabilitation	23,691	-	-	-	23,691	-	-	-	-	-	-	-
683 Heath Hill Road Pipe Replacement	19,358	-	-	-	19,358	-	-	-	-	-	-	-
689 James L. Gillis Pump Station Rehabilitation	33,419	-	-	-	33,419	-	-	-	-	-	-	-
692 NHS - Section 27 Improvements	1,294	-	27	1,143	1,326	-	27	1,175	32	-	-	32
693 NHS - Revere & Malden Pipeline Improvement	79,095	1,572	7,618	43,072	79,527	1,729	6,039	44,927	432	157	(1,579)	1,855
702 New Connect Mains-Shaft 7 to WASM 3	48,567	1,929	20,707	14,970	54,124	1,964	22,716	18,483	5,557	35	2,009	3,513
704 Rehabilitation of Other Pump Stations	50,258	-	1,321	18,879	50,258	-	1,321	18,879	-	-	-	-
706 NHS-Connecting Mains from Section 91	2,360	-	-	-	2,360	-	-	-	-	-	-	-
708 Northern Extra High Service New Pipelines	10,685	13	402	6,638	10,874	-	447	6,795	189	(13)	45	157
712 Cathodic Protection Of Distribution Mains	62,716	129	11,531	50,915	66,704	129	10,967	55,468	3,988	-	(564)	4,553
713 Spot Pond Supply Mains Rehabilitation	66,333	4,551	800	-	66,333	4,507	843	-	-	(44)	43	-
714 Southern Extra High Sections 41 & 42	3,657	-	-	-	3,657	-	-	-	-	-	-	-
719 Chestnut Hill Connecting Mains	33,435	816	-	15,132	33,827	800	-	15,540	392	(16)	-	408
720 Warren Cottage Line Rehabilitation	1,205	-	-	-	1,205	-	-	-	-	-	-	-
721 South Spine Distribution Mains	77,401	(9)	1,890	38,828	78,708	(9)	2,170	39,855	1,307	-	280	1,027
722 NIH Redundancy & Storage	118,494	41,927	42,080	28,512	120,366	42,921	44,244	27,226	1,872	994	2,164	(1,286)
723 Northern Low Service Rehabilitation Section 8	62,366	829	18,269	40,947	56,684	634	11,952	41,777	(5,682)	(195)	(6,317)	830
724 Northern High Service - Pipeline Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-
725 Hydraulic Model Update	598	-	-	-	598	-	-	-	-	-	-	-
727 Southern Extra High Redundancy & Storage	129,604	21,206	36,806	64,836	131,416	21,688	36,391	66,581	1,812	482	(415)	1,745
730 Weston Aqueduct Supply Mains	80,464	14,420	-	-	80,464	14,360	61	-	-	(60)	61	-
731 Lynnfield Pipeline	5,626	(52)	-	-	5,626	(52)	-	-	-	-	-	-
732 Walnut St. & Fisher Hill Pipeline Rehabilitation	2,717	-	-	-	2,717	-	-	-	-	-	-	-

**ATTACHMENT C**  
**Overview of the FY20 Proposed CIP and Changes from the Final FY19 CIP**

Program and Project	FY19 Final				FY20 Proposed				Change from Final FY19			
	Total Budget Amount	FY14-18	FY19-23	Beyond 23	Total Budget Amount	FY14-18	FY19-23	Beyond 23	Total Budget Amount	FY14-18	FY19-23	Beyond 23
733 NHS Pipeline Rehabilitation 13-18 & 48	-	-	-	-	-	-	-	-	-	-	-	-
734 Southern Extra High Pipelines-Sections 30, 39,40, & 44	-	-	-	-	-	-	-	-	-	-	-	-
735 Section 80 Rehabilitation	12,419	1,925	688	9,807	13,552	1,925	706	10,921	1,133	-	18	1,114
<b>Other</b>	<b>90,186</b>	<b>21,600</b>	<b>72,862</b>	<b>(156,010)</b>	<b>89,179</b>	<b>20,151</b>	<b>74,693</b>	<b>(157,399)</b>	<b>(1,007)</b>	<b>(1,449)</b>	<b>1,831</b>	<b>(1,389)</b>
753 Central Monitoring System	39,017	5,061	9,600	8,552	39,017	4,901	9,666	8,646	-	(160)	66	94
763 Distribution Systems Facilities Mapping	2,799	-	1,663	100	2,799	-	1,549	214	-	-	(114)	114
764 Local Water Infrastructure Renovation Assistance	7,488	-	-	-	7,488	-	-	-	-	-	-	-
765 Local Water Pipeline Improvement Loan Program	-	14,654	32,408	(173,921)	-	13,414	37,498	(177,771)	-	(1,240)	5,090	(3,850)
766 Waterworks Facility Asset Protection	40,882	1,886	29,191	9,259	39,875	1,837	25,980	11,512	(1,007)	(49)	(3,211)	2,253
<b>Business &amp; Operations Support</b>	<b>151,876</b>	<b>24,160</b>	<b>38,572</b>	<b>11,701</b>	<b>163,610</b>	<b>23,587</b>	<b>47,008</b>	<b>15,574</b>	<b>11,734</b>	<b>(573)</b>	<b>8,436</b>	<b>3,873</b>
881 Equipment Purchase	33,825	9,796	9,391	2,530	38,706	9,750	10,069	6,780	4,881	(46)	678	4,250
925 Technical Assistance	1,100	26	1,074	-	1,100	-	1,100	-	-	(26)	26	-
930 MWRA Facility - Chelsea	9,812	(2)	-	-	9,812	(2)	-	-	-	-	-	-
931 Business Systems Plan	24,563	111	-	-	24,563	111	-	-	-	-	-	-
932 Environmental Remediation	1,479	-	-	-	1,479	-	-	-	-	-	-	-
933 Capital Maintenance Planning	23,157	4,513	8,519	-	28,162	4,076	13,961	-	5,005	(437)	5,442	-
934 MWRA Facilities Management	2,151	-	1,780	-	2,871	-	2,500	-	720	-	720	-
935 Alternative Energy Initiatives	23,476	1,221	-	5,058	23,598	1,221	-	5,181	122	-	-	123
940 Applicat Improv Program	12,198	2,828	5,337	3,961	11,413	2,819	5,060	3,461	(785)	(9)	(277)	(500)
942 Info Security Program ISP	3,727	1,146	2,045	-	5,506	1,173	3,798	-	1,779	27	1,753	-
944 Info Tech Mgmt Program	636	-	636	-	200	-	200	-	(436)	-	(436)	-
946 IT Infrastructure Program	15,754	4,522	9,789	152	16,202	4,440	10,319	152	448	(82)	530	-

**STAFF SUMMARY**

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Security Guard Services for Various MWRA Facilities  
Universal Protection Service LLC, d/b/a Allied Universal Security Services  
Contract EXE-041

---

**COMMITTEE:** Administration, Finance & Audit

         INFORMATION

  X   VOTE

  
Michele S. Gillen

Director of Administration

  
Andrew Hildick-Smith

Director, Office of Emergency  
Preparedness

---

Kathryn White, Security Administrator  
Preparer/Title

**RECOMMENDATION:**

To approve the award of a contract to Universal Protection Service LLC, d/b/a Allied Universal Security Services, to provide security guard services to the MWRA for the Deer Island Treatment Plant, Chelsea Facility, Charlestown Navy Yard, and the Carroll Water Treatment Plant facilities; and to authorize the Executive Director, on behalf of the Authority, to execute a contract with Universal Protection Service LLC, d/b/a Allied Universal Security Services in an amount not to exceed \$6,849,216.00 for a period of 1,096 calendar days from the Notice to Proceed date with an option to renew for two additional 365 calendar day periods, subject to further Board approval.

**DISCUSSION:**

This contract will provide site security guards and monitoring services at the Deer Island Treatment Plant, Chelsea Facility, and Carroll Water Treatment Plant 24 hours per day, 7 days per week, as well as 20 hours per week at Charlestown Navy Yard. Security services include stationary guard coverage and mobile patrols, enforcement of site badging systems, monitoring of security surveillance system for remote locations, and reporting security and fire related incidents. This contract will replace the Authority's existing contract EXE-033 with AlliedBarton Security Services Associates, Inc. which was approved by the Board on December 18, 2013 and expires on February 4, 2019.

Security services are necessary to control access and to provide security for Deer Island. This agreement directs the contractor to provide staff monitoring of security cameras and other electronic alarms (including fire) and to support public safety operations during fires and other

emergencies. Security staff at the Chelsea Facility provide onsite security, access control and protection of MWRA property. Security personnel at the Chelsea Facility are also responsible for monitoring access control alarms and video surveillance for remote critical water and wastewater facilities. Security personnel are necessary at the Carroll Plant to enforce access control, provide on-site security of MWRA property, and assist in all security incidents and other emergencies including supporting public safety operations during fires. At the Charlestown Navy Yard (CNY), Security personnel are necessary to enforce access control and provide on-site security for employees, guests, contractors, and the MWRA Advisory Board. The Agreement provides for supervisory personnel at Deer Island, Carroll Plant, CNY, and the Chelsea Facility to report directly to the Contractor's Account Manager, who has overall supervisory responsibility for security guard supervision at all facilities.

Procurement Process

These services were procured using a ‘one-step’ RFQ/P procurement process in which interested firms were asked to submit both technical and cost proposals simultaneously; the Proposals were first evaluated for compliance with threshold items. Those found to have met the threshold had their proposals further evaluated against three Evaluation Criteria, which were assigned the following points: Cost (40), Technical Approach, Capacity and Management Approach (30) and Qualifications, Experience, Past Performance and Key Personnel (30). The RFQ/P also requested supporting information reflecting the relevance of the firm’s experience to MWRA’s size and technical needs and in providing comprehensive training for guard staff members.

The project was publicly advertised on August 25, 2018, and on September 27, 2018, three firms submitted Statements of Qualifications and Proposals. All three proposals were reviewed in depth and scored using each of the three Evaluation Criteria. The proposers are listed below, ranked by the selection committee’s order of preference, totaled from committee members’ raw scores. Discussion of each firm follows.

<u>Firm</u>	<u>Total Score</u>	<u>Final Points</u>	<u>Rank</u>	<u>Price *</u>
Universal Protection Service LLC, d/b/a Allied Universal Security Services	412	5	1	\$6,859,216
United Security	344	12	2	\$6,994,984
G4S Secure Solutions	327	13	3	\$7,114,506

\* Mathematical errors corrected in all three bidders' bid prices as is permitted under the MWRA's non-professional services procurement process.

Universal Protection Service LLC, d/b/a Allied Universal Security Services, a national security firm with a strong local presence, was ranked first by the selection committee based on its depth of experience. In addition, as the incumbent<sup>1</sup>, Universal Protection Service LLC, d/b/a Allied

---

<sup>1</sup> In 2016, the incumbent, AlliedBarton Security Services, LLC, and Universal Services of America announced their intention to merge, pending regulatory commission approval. The merger was completed in August 2016, with the combined company being called Allied Universal Security Services.

Universal Security Services had an excellent record of past performance and the lowest price. Some of Universal Protection Service LLC, d/b/a Allied Universal Security Services past and existing security clients include DC Water & Sewer Authority, Las Vegas Valley Water SJWC, City of Dallas Water Utilities, Distrigas of Massachusetts, Prudential Towers and the John Hancock Building. This firm clearly had the most direct experience in guarding critical infrastructure sites and complex mechanical facilities using remote intrusion detection and video surveillance. The firm also demonstrated its commitment to both developing and maintaining a well-trained workforce, and providing incentives and benefits designed to encourage staff retention.

Universal Protection Service operates an in-house training program for new hires that is equipped to deal with contract organizations similar to the complexity of the MWRA contract. In addition to standard guard services training, this nationally scoped program offers useful special topics including Terrorism Awareness, Bomb Threats, Access Control and Workplace Violence, and includes advanced topics for supervisory personnel.

United Security was ranked second. The selection committee consensus was that Universal Protection Service LLC, d/b/a Allied Universal Security Services is a better value in terms of quality, capacity and organizational resources.

G4S's proposal was not as strong as the others. The selection committee vote reflected the firm's high price and lack of utility/critical infrastructure experience.

**BUDGET/FISCAL IMPACT:**

These services will be funded through the Current Expense Budget. The FY19 CEB includes \$1,903,440 for Guard Services. It is anticipated that with the addition of the new contract we will be over budget by \$62,000 at the end of the fiscal year. Additional cost will be absorbed in the overall MWRA Current Expense Budget.

**MBE/WBE PARTICIPATION:**

There were 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:** December 19, 2018  
**SUBJECT:** Managed Security Services  
NWN Corporation  
Contract 7499, Amendment 1



**COMMITTEE:** Administration, Finance & Audit

       INFORMATION  
  X   VOTE

  
Russell J. Murray, Jr., Director, MIS  
Paula Weadick, Deputy Director, MIS  
David M. Stokes, Sr. Program Manager, IS Security  
Preparer/Title

  
Michele S. Gillen  
Director, Administration

*Staff are presenting two staff summaries related to cyber security at this Board meeting: this one, recommending Amendment 1 to the existing cyber security services (Managed Security Services) contract to extend the contract by 24 months as well as a separate staff summary to be presented in Executive Session to provide the Board with a comprehensive cyber security update.*

### RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to approve Amendment 1 to Contract 7499, Managed Security Services, with NWN Corporation in the amount of \$1,075,633.19, increasing the contract total from \$2,109,842 to an amount not to exceed \$3,185,475.19, and approving the option to extend the term by 24 months, from July 4, 2019 through July 4, 2021.

### BACKGROUND:

On March 16, 2016, the Board approved the award of Contract 7499 to NWN Corporation to provide cyber security services and products to MWRA. The original contract, in the amount of \$2,109,842, was for 39 months and included two 12-month options to extend, subject to the Board's approval. Staff are recommending approval of both 12-month extension options for the reasons described below.

MWRA conducted a competitive, best value procurement, with cost, capacity/qualifications/key personal, technical approach/organization/management and similar experience/past performance on MWRA and non-MWRA projects as the selection criteria to select a cyber security services provider. At that time, the Selection Committee unanimously ranked NWN first based on the

overall strength of its proposal, which included the lowest cost proposal.<sup>1</sup> The proposers were also required to include pricing for two optional 12-month extensions as part of the original competitive procurement process. NWN provided the lowest cost proposal for both extension options. Staff have recently negotiated an additional 10.7% decrease over the original quote, in exchange for MWRA exercising the two 12-month extensions concurrently.

The recommended extension includes maintenance for all managed devices, continuous monitoring, 24/7 alerting of cyber security events, and incident response services for an additional twenty-four months.

#### **DISCUSSION:**

MWRA has seen a greater than 50% increase in the volume of logs (a detailed listing of a computer's events) generated from its cyber security infrastructure over the life of this contract. Staff anticipate that volume will continue to increase over the next two years as additional security requirements from federal standards and regulations will likely require configuration changes to provide additional logging of computer activity. Additionally, MWRA has seen a 67% decrease in actionable alerts from its cyber security services provider. NWN has been fine-tuning the cyber intrusion detection and prevention devices in order to decrease false positives, to increase performance, and to incorporate additionally available threat intelligence information into the security protocols which can result in faster and more accurate identification and elimination of known threats.

Staff believe the proposed price for the extension period, particularly given the additional discount over the original price, to be fair and reasonable. Staff have also been pleased with the services provided by NWN and believe the devices and software currently in place, which have not yet reached end of life, are appropriate at this time. Given that MWRA will continue to maintain the same services as it currently does, at a further discounted price, in an environment in which the cyber security "traffic" has increased significantly since the beginning of the contract, and will continue to increase, staff believe it is appropriate to extend the current contract for both 12-month extension options.

Should the Board approve the extension, staff will continue to research cyber security improvements for MWRA that utilize the latest technological advances and efficiencies available within the market and will consider all available best practice guidance from the Department of Homeland Security to recommend the most appropriate approach. This will form the basis for a new scope of services for the next Managed Security Services contract that will be competitively procured.

#### **BUDGET/FISCAL IMPACTS:**

There are sufficient funds in the requested FY20 Current Expense Budget for this contract. The original contract award for all hardware, software, support, monitoring, and installation charges for three years was \$2,109,842.00. The total cost of Amendment 1 is \$1,075,633.19.

---

<sup>1</sup> Two other proposers had lower cost proposals, but those costs did not include certain hardware and software that was required in the scope of services.

Contract Summary:

	<i>Price</i>	<i>Duration</i>	<i>End Date</i>
Original Contract	\$2,109,842.00	39 months	07/04/2019
<u>Amendment 1</u>	<u>\$1,075,633.19</u>	<u>24 months</u>	<u>07/04/2021</u>
Revised Contract Total	\$3,185,475.19	63 months	07/04/2021

**MBE/WBE PARTICIPATION:**

Due to the limited subcontracting opportunities, no MBE or WBE participation criteria were established for this procurement.



# 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, December 19, 2018

*Chair:* P. Flanagan  
*Vice-Chair:* J. Walsh  
*Committee Members:*  
J. Carroll  
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. Update on Construction of the Cross-Harbor Cable
2. Emerging Contaminants

#### **B. Approvals**

1. Approval of Two New Members of the Wastewater Advisory Committee
2. Approval of Amendment 2 to Memorandum of Understanding with Massachusetts Department of Fish and Game for Public Access Fishing Pier at Deer Island

#### **C. Contract Awards**

1. Refurbishment of Secondary Reactor Aerator and Mixer Gearboxes at the Deer Island Treatment Plant: SPX Corporation, Bid WRA-4594

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Meeting of the

### Wastewater Policy and Oversight Committee

November 14, 2018

A meeting of the Wastewater Policy and Oversight Committee was held on November 14, 2018 at the Authority headquarters in Charlestown. Committee Chair Flanagan presided. Present from the Board were Ms. Wolowicz and Messrs. Carroll, Cotter, Foti, Pappastergion, Peña, Vitale and Walsh. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, Kathleen Murtagh, Stephen Cullen, Mark Johnson, Corrinne Barrett, Jami Walsh, Martin McGowan and Kristin MacDougall. The meeting was called to order at 10:18 a.m.

#### **Information**

##### Update on Alewife Brook Pumping Station Rehabilitation

Staff made a presentation on construction progress.

#### **Contract Amendments/Change Orders**

##### \* Chelsea Creek Headworks Upgrade, BHD/BEC 2015, A Joint Venture, Contract 7161, Change Order 22

Staff made a presentation on the proposed change order. Mr. Vitale requested a report on how many change orders have been submitted, accepted and denied. There was general discussion and questions and answers.

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

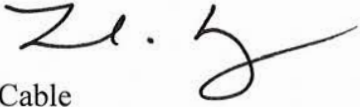
The meeting adjourned at 10:33 a.m.

---

\* Committee recommendation approved by the Board on November 14, 2018



## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Update on Construction of Cross-Harbor Cable

---

**COMMITTEE:** Wastewater Policy & Oversight

INFORMATION  
 VOTE

David Duest, Director, Deer Island WWTP  
Richard J. Adams, Manager, Engineering Services  
Preparer/Title

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

---

### RECOMMENDATION:

For information only.

### BACKGROUND:

Massport and the U.S. Army Corp of Engineers have been progressing with the dredging improvement project for Boston Harbor including the Reserved Channel. The goal of the project is to deepen the harbor to allow deep draft ships to enter Boston Harbor and the Reserved Channel. Deer Island's primary electric power source is supplied by a submerged armored submarine cable through the Reserved Channel and Boston Harbor. The existing cable was installed in 1989-1990 by the Harbor Electric Energy Company (HEEC) at depths that were shallower in some locations than required by the Army Corps permit. The cable is being replaced under a Memorandum of Understanding between the MWRA and HEEC dated and executed on May 9, 2017, and a corresponding Court order.

### DISCUSSION:

The existing submarine cable is being replaced with a solid dielectric cable, which is more environmentally friendly than the existing oil filled cable and will be rated at the same voltage (115,000 volts) and capacity (90MVA) as the existing cable. The final cable routing was selected from a number of alternatives as shown on Figure 1. The cable is in the process of being installed by the use of an open excavation duct bank system for the land-based route, which transitions to a marine cable from Conley Terminal to Deer Island. The marine cable is being installed utilizing Horizontal Directional Drilling (HDD) and Hydroplowing methods of construction. The total length of the cable is approximately four-miles from K Street in South Boston to Deer Island.



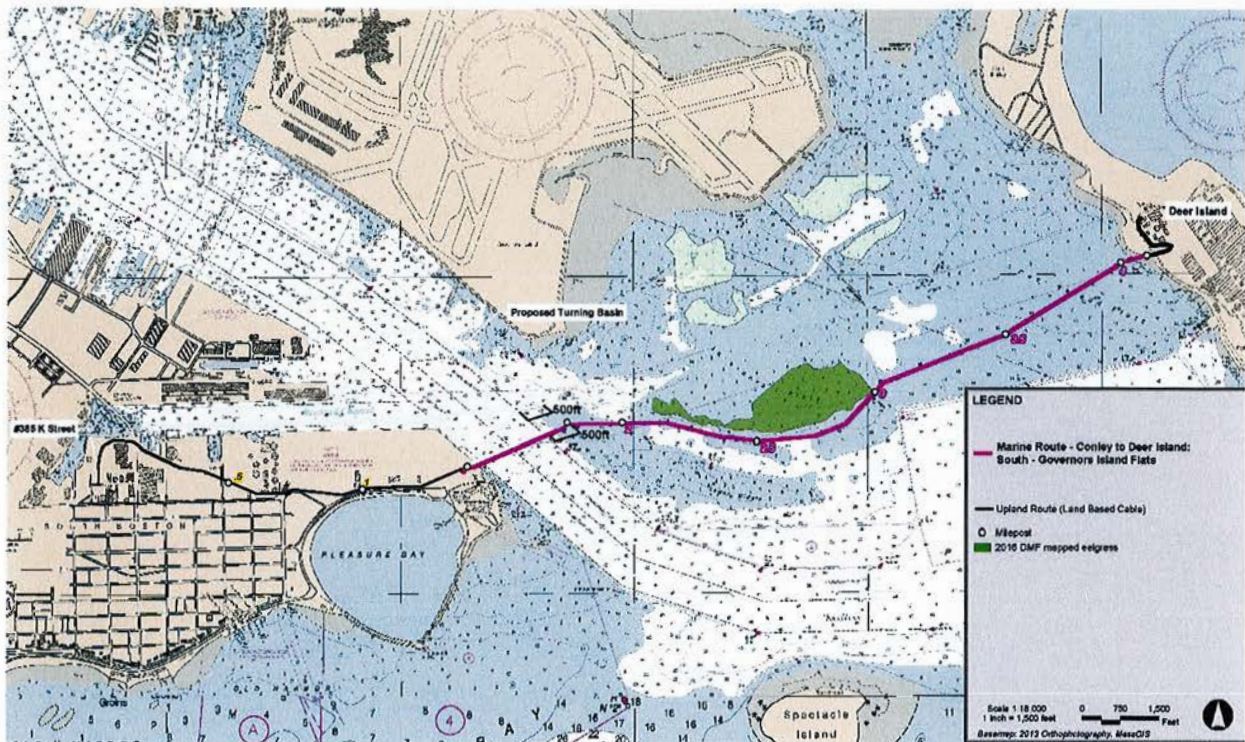


Figure 1-Cable Routes

The open excavation construction work commenced in October at Conley Terminal (Figure 2) and in November on Deer Island (Figure 3). The open excavation trench work is approximately 55% complete at this time. The HDD work commenced at Conley Terminal in late November 2018 and is approximately 36% complete. The HDD drilling operation on Deer Island will be starting later this month.

The marine cable is being manufactured in Milan, Italy. The cable is in full production and is expected to be delivered at the beginning of March 2019. Installation of the cable is scheduled to begin in April 2019. The new cable is scheduled to be placed in service in September 2019. The existing cable will be removed after the new cable has been fully tested and successfully completed a 30-day operational test. The new cable must be placed into service before December 31, 2019, to comply with the Court order for the dredging project.



Figure 2 - Excavation Conley Terminal



Figure 3 - Excavation Deer Island

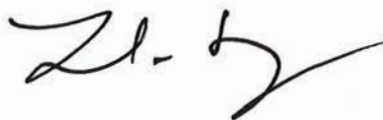


**BUDGET/FISCAL IMPACT:**

There will be two funding sources for this project: 50% of the new cable project after credits will be paid to HEEC from the balance of the Current Revenue for Capital funds budgeted in FY2019 and prior years. The first progress payment of \$18 million has been made from Current Revenue for Capital to HEEC representing 50% of the progress (\$36 million) through October 2018. Staff estimate that making progress payments will reduce the total cost of the cable over 30 years by approximately \$2.9 million. The annual “capacity charge” of the new cable, similar to the old cable’s financial arrangement, will be funded from the Indirect Expense section of the Current Expense Budget over 30 years.

## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director  
**DATE:** December 19, 2018  
**SUBJECT:** Emerging Contaminants

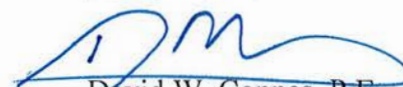


---

**COMMITTEE:** Wastewater Policy & Oversight

INFORMATION  
 VOTE

Carolyn M. Fiore, Deputy Chief Operating Officer  
Betsy Reilley, Ph.D., Director, Environmental Quality  
Preparer/Title



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

---

### RECOMMENDATION:

For information only.

### DISCUSSION:

On Saturday, December 8, 2018 the Boston Globe published an editorial declaring that MWRA had fulfilled its mission of cleaning up Boston Harbor. It then suggested that MWRA should turn its expertise to emerging threats to the marine environment: plastics, pharmaceuticals, hormones, nutrients, industrial chemicals, and the like through expansion of MWRA's existing outfall monitoring program.

Mr. Carroll asked that staff prepare a white paper on these emerging contaminants. The attached document describes the different categories of emerging contaminants most often cited and some of the challenges involved in monitoring and testing for their presence in wastewater and in understanding the implications of their existence.

### ATTACHMENTS:

Boston Globe Editorial: "Expand the MWRA's Mission" December 8, 2018

MWRA Advisory Board Letter to the Editor, Boston Globe, December 14, 2018

White Paper on Emerging Contaminants: Pharmaceutical and Personal Care Products, Endocrine Disrupting Chemicals, Microplastics, and Perfluorinated Chemicals

# The Boston Globe

## EDITORIAL

December 8, 2018

### **Expand the MWRA's Mission**

The Massachusetts Water Resources Authority has fulfilled its mission of cleaning up Boston Harbor — and without adverse impacts farther out into Massachusetts Bay. An entire generation of Bostonians has grown up without remembering when the harbor bottom was the consistency of black mayonnaise and flounder were turning up with ulcers and liver tumors. A recent report from the Woods Hole Oceanographic Institute declared the harbor's winter flounder to be tumor-free for the 14th consecutive year.

So far, so healthy. Now the question comes whether the MWRA's expertise should be turned toward monitoring new and emerging threats to the marine environment: plastics, pharmaceuticals, hormones, nutrients, industrial chemicals, and the like. With an extensive and successful monitoring infrastructure already in place, it would seem a natural fit. The world produces 322 million tons of plastics every year, up from 15 million a half-century ago. Each year, at least 8 million tons of plastic waste leaks into the oceans. The World Economic Forum warns that by 2050 there could be more plastic in the sea than fish. Plastics and other emerging pollutants can work their way up the food chain to our diets. Hundreds of marine animals eat micro-plastics, the tiny bits that break down from larger trash in the sea. Only a fraction of the medicines we consume is metabolized by our bodies; the rest is excreted or washed into the waste stream. Oysters are particularly vulnerable to waste from pharmaceuticals and personal-care products because they are filter-feeders, sifting contaminants through their gills.

The Environmental Protection Agency hasn't set discharge standards for most of these compounds, and while the MWRA did test the drinking water supply at all its protected reservoirs and found no evidence of pharmaceuticals, it has not been tracking the wastewater that comes into its treatment plant at Deer Island or releases through its 9.5 mile-outfall pipe where treated sewage is discharged.

The MWRA's monitoring program — an exhaustive collection of data on oxygen levels, pathogens, metals, algae blooms, fish populations, and more — began 29 years ago, before the agency constructed the Deer Island plant, but it was codified in 2000, under a federal permit to build the outfall pipe. The permit also created a group of technical experts who analyze the reams of data collected. At a recent workshop, the panel and other harbor advocates discussed the threat of emerging contaminants with an eye toward recommending whether and how the MWRA should address the challenges.

“The MWRA has transformed Boston Harbor and the health of Massachusetts Bay, and it's an extraordinary achievement,” said Bruce Berman of Save the Harbor Save the Bay, which cosponsored the workshop, “but the outfall pipe remains one of the largest sources of pollutants into a changing ocean.”

The dividend for the \$4.7 billion public investment in the cleanup — including the overhaul of 84 combined sewer overflow pipes that used to dump sewage into the harbor and rivers with every rainstorm — is a healthy environment, some of the cleanest urban beaches in the country, and a development explosion in the Seaport District. The 43 cities and towns of the MWRA district owe the agency a debt.

Many questions remain about how best to design a monitoring system for the new contaminants, how long it might take to phase in, whether the MWRA should enlist new partners in the effort, and whether it can all be done for the relatively inexpensive \$1.5 million a year the agency currently spends on monitoring. But the MWRA is uniquely positioned to answer those questions. It is clear that a shift in focus would be consistent with the agency's mission.

# The Boston Globe

## **Letter: MWRA has fulfilled its mission — time for other stakeholders to step up**

December 14, 2018

The MWRA Advisory Board is glad that the Globe acknowledges in its Editorial “Boston Harbor is clean but could face new threats to marine life: plastics and drugs” that the MWRA has successfully fulfilled its mission to clean up Boston Harbor.

Clearly, the cleanup is an environmental and economic success story which has benefitted all of Massachusetts. Where the Globe has it backwards is when it states “The 43 cities and towns of the MWRA district owe the agency a debt.” It is the MWRA and all of Massachusetts who owe the 43 communities a huge “high five.”

That \$4.7 billion came, and continues to come, from ratepayers in these communities. It didn’t come from the Commonwealth, and absolutely did not come from the Federal Government.

The Globe now believes that no good work should go unpunished: “MWRA should turn and focus on new contaminants...It is clear that a shift in focus would be consistent with the agency’s mission.” Really?!?

Ratepayers have expended over \$74 million in monitoring since 1992. The MWRA has spent over 2,300 survey days collecting and analyzing nutrients in seawater, phytoplankton, zooplankton, as well as thousands of measurements per year for other parameters like chlorophyll and dissolved oxygen.

As the Globe states, this monitoring has found no evidence that MWRA’s outfall discharge causes degradation in Mass. Bay. The MWRA has done its job.

Emerging threats to the marine environment such as pharmaceuticals and plastics should be evaluated, but the MWRA is not the only stakeholder and this should not be funded on our ratepayers’ dime. It is past time for others to step up to the plate.

For instance, the Advisory Board has long advocated for State resources to adequately fund the Department of Environmental Protection (MassDEP). With the State coffers overflowing, it is time for the State as well as other stakeholders to begin to fulfill their responsibilities – the MWRA and its ratepayers have absolutely fulfilled ours.

*Joseph Favaloro is the Executive Director of the MWRA Advisory Board, which was created in the same statute that created the MWRA. Our role is to represent the interests of the MWRA’s member communities. For more information, go to [www.mwraadvisoryboard.com](http://www.mwraadvisoryboard.com).*

# **Emerging Contaminants: Pharmaceutical and Personal Care Products, Endocrine Disrupting Chemicals, Microplastics, and Perfluorinated Chemicals**

## **EXECUTIVE SUMMARY:**

Pharmaceutical and Personal Care Products (PPCPs), and other emerging contaminants, are expected to be present in wastewaters worldwide including MWRA's wastewater. This is not an issue exclusive to MWRA. MWRA has very limited data on seventeen pharmaceutical products in the influent and effluent wastewater at Deer Island Treatment Plant. For those constituents that showed decreases across the treatment process, reductions ranged from less than 20% to >90%.

PPCPs are not regulated, monitoring is not required, and limits have not been developed. To date, research throughout the world has not demonstrated an impact on human health from the trace amounts of pharmaceuticals and personal care products found in wastewater.

Treatment methods to reduce or remove the broad category of pharmaceuticals and other emerging contaminants has not been well studied, but if there were a need for treatment, it is certain that for some of these, advanced treatment methods would be necessary.

Typical wastewater NPDES permits require "Whole Effluent Toxicity" testing, and this is generally a catch-all for indicating whether there are unregulated pollutants (or combinations of pollutants) that may have a toxic effect on organisms. Deer Island Treatment Plant has eleven years of compliance with this test.

EPA, the Water Research Foundation, and many universities have been engaged in research on the fate, transport, occurrence, and health and ecological effects of these emerging contaminants. MWRA continues to monitor the findings of these studies.

## Emerging Contaminants: Pharmaceutical and Personal Care Products, Endocrine Disrupting Chemicals, Microplastics, and Perfluorinated Chemicals

### What are the emerging contaminants of concern?

Pharmaceutical and Personal Care Products (PPCPs) include many substances used by individuals for personal health or cosmetic reasons and products used by agribusiness to boost growth or health of livestock. The environmental effect of PPCPs is currently being widely investigated. PPCPs have been detected in water bodies throughout the world. The effects of these chemicals on humans and the environment are not yet known, but to date there is no scientific evidence that they affect human health.

Some specific PPCPs include:

- sulfamethoxazole - antibiotic
- trimethoprim - antibiotic.
- carbamazepine - anti-convulsant medications used to treat epilepsy
- acetaminophen - analgesic (pain reliever) and antipyretic (fever reducer)
- caffeine - stimulant
- fluoxetine - antidepressant
- Triclosan - anti-bacterial (soon to be banned)
- Gemfibrozil – cholesterol medication
- DEET – insect repellent

In addition to PPCPs, there are concerns with Endocrine Disrupting Chemicals (EDCs) and hormones. There are well over 325 EDCs that are of potential environmental concern. The health effects of EDCs are unknown, but are claimed to include a broad range of hormonal effects, diabetes, cancer, behavioral issues, child development, immune disorders, etc.

Microplastics are small, barely visible pieces of plastic that enter and pollute the environment. Microplastics are not a specific kind of plastic, but rather any type of plastic fragment or fiber (frequently identified as being less than five millimeters in length). They enter natural ecosystems from a variety of sources, including cosmetics, clothing, and industrial processes. Additionally, larger plastics, over time, will deteriorate and become microplastics. The entire cycle and movement of microplastics in the environment and in the food web is not yet known, but research is currently underway to investigate this issue. Microbeads are being voluntarily discontinued in many cosmetic products. But many other sources of plastics exist and are well distributed throughout our environment and used in our daily lives.

Some other recent industrial compounds that have been in the news include per- and polyfluoroalkyl substances (together abbreviated as PFASs). These are a class of man-made chemicals typically associated with manufacturing of non-stick coatings, and water proofing and stain proofing treatments. They have also been associated with certain fire-fighting foams. The US EPA has issued health advisories of 70 parts per trillion for two of the perfluorinated compounds in drinking water; perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). PFOA and PFOS have been the most extensively produced and studied of the PFAS chemicals. MA DEP reports



that many PFAS are no longer being produced in this country; the largest manufacturer completely stopped PFOA/PFOS production in 2002. PFAS are still being produced in other countries and may be imported into the US in limited quantities. The US Environmental Protection Agency (EPA) and the PFAS industry launched the PFOA Stewardship Program in 2006 to work toward ending the production of PFOA and other PFAS.

Note that there are over 100 million organic and inorganic chemicals in use today, and thousands of new chemicals are being developed daily!

#### Are these emerging contaminants in MWRA wastewater?

Pharmaceutical and Personal Care Products (PPCPs), and other emerging contaminants, are expected to be present in wastewaters worldwide including MWRA's wastewater. This is not an issue exclusive to MWRA. These contaminants enter the wastestream through everyday household activities including laundry (microplastics and microfibers from clothing), use of personal care products (which may contain microbeads), the body naturally excreting pharmaceuticals and hormones, and use of household products (including non-stick pans, waterproofed materials, polishes and cleaners which may contain PFAS).

Monitoring for a number of pharmaceutical products was performed in 2007 throughout the DITP treatment process including influent and effluent sampling. A variety of compounds were tested including antibiotics, analgesics, antidepressants, and hormones. Some were reduced in concentration through treatment, others were not. Concentrations of PPCPs in the final effluent were generally in the low ng/L (or parts per trillion) range, and comparable to those reported from other treatment plants (e.g., Fatta-Kassinos et al. 2011, Ghosh et al. 2009, Comeau et al. 2008, Okuda et al. 2008, Ternes et al. 2004). Some of the tested compounds were below the effect level observed on animals in lab studies (e.g., Fong and Molnar 2013). For those constituents that showed decreases across the treatment process, reductions ranged from less than 20% (carbamazepine) to >90% (acetaminophen, ethyl estradiol, caffeine, triclosan, and phenol). (*MIT Seagrant, 2015*)

#### What is the regulatory environment for emerging contaminants?

EPA has not yet issued drinking or wastewater standards for PPCPs, EDCs, or microplastics, and does not yet require testing for them. Typical wastewater NPDES permits require "Whole Effluent Toxicity" testing, and this is generally a catch-all for indicating whether there are unregulated pollutants (or combinations of pollutants) that may have a toxic effect on organisms. EPA, the Water Research Foundation, and many universities have been engaged in research on the fate, transport, occurrence, and health and ecological effects of these emerging contaminants. Monitoring in drinking water for PFAS compounds was required as part of the EPA Unregulated Contaminant Rule Monitoring program (UCMR3, 2013-2015), and there is a non-enforceable drinking water guideline (*MA DEP*).

#### Who is monitoring for emerging contaminants in wastewater?

Mostly this research is being conducted by EPA, universities, the Water Research Foundation (WRF), or by utilities who want to gather information on their system. MWRA performed a study in 2007, participated in a MIT Seagrant review in 2015, and is currently participating in a long term UMass Lowell monitoring project to evaluate the fate of pharmaceuticals (focused on controlled

substances) in treatment plants and in receiving streams. The sampling pool will ultimately include approximately 30 WWTPs in the New England area. The study will include analysis of monthly DITP samples through August 2020.

Monitoring for PPCPs is extremely resource-intensive, as there are hundreds of individual chemical constituents of potential concern (Fatta-Kassinos et al. 2011). They may be present and biologically active at very low concentrations, making measurement difficult. Specialized sampling techniques are required (especially for microplastics) and outside specialized labs are required. While there are some limited studies from other systems/locations upon which MWRA could compare results, at this time there isn't a lot of available data, nor is it known what levels would be a problem.

A 2015 study by MIT Seagrant of POTWs in Massachusetts determined that:

*"The MWRA serves a large population of 2.5 million people and 5,500 large industrial users (Bowe, 2008), including nine pharmaceutical industries, 62 hospitals, 10 long term care facilities, and 61 veterinary hospitals. The receiving waterbody is at low risk; their outfall is 15 km offshore with a high dilution (>100:1), and to date there has been no evidence of PPCP-related ecological impairment at the discharge site."*

Are there other potential concerns to MWRA regarding emerging contaminants?

Some of these contaminants would be expected to also be present in sludge – even less study has been performed on biosolids. We have some limited results on PFOS and PFOA, and several pharmaceutical compounds. MWRA biosolids generally have mid-range levels compared to other representative biosolids included in a study by Purdue University. (*Purdue University, Linda Lee 2016 presentation*)

How would MWRA monitor for emerging contaminants?

*Can MWRA's Department of Laboratory Services run these tests?*

These are not standard tests, and MWRA is not set up to run these analyses. Outside labs will be needed.

*How much does it cost for monitoring of these compounds?*

In 2007, testing for PPCPs was done by MWH (now Eurofins). Current costs are estimated to be between \$300 - \$400/sample, but will depend on the specific compounds to be analyzed.

Costs for Endocrine-disrupting chemicals and PFASs are also expected to be on the order of \$300-\$400 per sample, but will vary depending on the specific compounds to be tested.

Microplastics are more problematic – there are no standard methods. Analysis should be done by a specialized lab since this type of analysis is prone to contamination. Possible costs are approx. \$800/sample. Comparability of results will be hindered by which lab performs the testing and which methods are used.

*Where should samples be collected?*

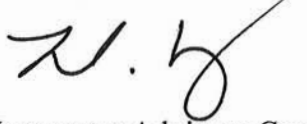
Samples can be collected at any of the standard sampling locations at Deer Island Treatment Plant. Specific sampling procedures for microplastics will need to be worked out with the lab.

Sampling can also be performed in Massachusetts Bay, but this requires specialized sampling equipment and matrix effects of seawater may hinder analyses. Due to the low levels of these contaminants expected to be present in the effluent directly, it is uncertain that it would be possible to detect these in Massachusetts Bay as a result of the outfall discharge. Control sites would need to be identified and tested as well.

What about the drinking water?

Testing of MWRA's drinking water showed that there are no pharmaceuticals present, according to testing performed in 2008. Monitoring under EPA's UCMR3 program in 2013-2015 showed there was no PFOS/PFOA in MWRA drinking water. Such contaminants are not expected to be present because the Quabbin and Wachusett Reservoirs are well protected, and have no sources of wastewater into the reservoirs or tributaries. In addition, treatment at the Carroll Water Treatment Plant is effective at breaking down many contaminants.

### STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Approval of Two New Members of the Wastewater Advisory Committee

---

COMMITTEE: Wastewater Policy & Oversight

INFORMATION  
 VOTE

Wendy Leo, Senior Program Manager  
Preparer/Title



Sean Navin  
Director, Intergovernmental Affairs 

---

#### RECOMMENDATION:

To approve the addition of two new members, Ms. Belinda Stansbury and Kannan Vembu, Ph.D. to the Wastewater Advisory Committee.

#### DISCUSSION:

In addition to the critical oversight functions of the Advisory Board, many of MWRA's policy decisions are made with advice and support from two standing citizens' advisory committees, the Water Supply Citizens Advisory Committee (WSCAC) and the Wastewater Advisory Committee (WAC).

The WAC was created in 1990 to offer independent recommendations on wastewater programs and policies; it is a successor to the Facilities Planning Citizen Advisory Committee, which was established during the planning of the new Deer Island Treatment Plant. WAC's members include citizen advocates, representatives from the Metropolitan Area Planning Council, watershed associations, the engineering and business communities, environmental law, and the science and education fields. The Advisory Board has historically appointed a member as well.

The WAC Contract provides that WAC shall have a maximum of twenty members approved by MWRA's Board of Directors; the Contract prohibits alternates or designees. WAC elects its chairman and employs an Executive Director (selected by WAC's membership with the concurrence and approval of MWRA's Public Affairs Department). WAC's current chairman is Karen Lachmayr and WAC's current Executive Director is Andreae Downs.

The first proposed new member, Ms. Stansbury, is the Director of Operations at Practical Applications Inc. in Woburn. Ms. Stansbury has ten years of experience in wastewater treatment, analytical laboratory analysis, environmental regulatory compliance, and water and wastewater system compliance and maintenance.


The second proposed new member, Dr. Vembu, is Managing Director at AquaEnviroBio Solutions LLC, in Natick. He has 39 years of service in the wastewater industry and has worked on assignments in 46 countries in North and South America, Europe, Asia, and the Middle East. Additionally, Dr. Kembu once served as the town of Natick's representative on the MWRA Advisory Board.

The current thirteen members on WAC are: Mary Adelstein, citizen advocate; George Atallah, Triumvirate Environmental; Craig Allen, Commonwealth Research Group, Inc.; Philip Ashcroft, New England Water Innovation Network; Adriana Cillo, Boston Water and Sewer Commission; Wayne Chouinard, Town of Arlington DPW; Zhanna Davidovitz, Massachusetts Institute of Technology (vice chair); Stephen Greene, Howland-Greene Consultants; James Guidod, MWRA Advisory Board; Taber Keally, Neponset River Watershed Association; Karen Lachmayr, Harvard University (chair); Martin Pillsbury, Metropolitan Area Planning Council; Dan Winograd, Woodard & Curran.

In accordance with the current Agreement, WAC unanimously nominated Ms. Stansbury and Dr. Kembu for membership at its December 2018 meeting.



## STAFF SUMMARY

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Approval of Amendment 2 to Memorandum of Understanding with Mass. Department of Fish and Game for Public Access Fishing Pier at Deer Island

**COMMITTEE:** Wastewater Policy & Oversight

     INFORMATION

  X   VOTE

  
David W. Coppes, P.E.

Chief Operating Officer

  
Carolyn Francisco Murphy

General Counsel

Stephen D. Cullen, Director, Wastewater  
David F. Duest, Director, DITP  
Preparer/Title

### RECOMMENDATION:

That the Board authorize the Executive Director, on behalf of the Authority, to execute Amendment 2 to an existing Memorandum of Understanding with the Massachusetts Department of Fish and Game, and other fisheries offices, substantially in the form attached to this staff summary authorizing the Department to award the construction of a fishing pier and associated lighting, security improvements, and 20 pier parking spaces within the public access portion of Deer Island for general public access use, increasing MWRA's share of the project cost by \$77,370 from \$245,790 to \$323,160, and to authorize MWRA to provide general oversight and monitoring of the use of the fishing pier and parking areas.

### BACKGROUND:

In 1986, the Massachusetts Legislature set aside lands around the perimeter of Deer Island, which were not otherwise needed for new wastewater treatment plant improvements, to be dedicated to open space uses for public access as mitigation for the expansion of the treatment facilities that were to be built on the island. The island perimeter walking trail has served as a unique opportunity for the public to enjoy the aesthetic and recreational activities which were intended by the Legislature.

The Legislature has additionally charged the Department of Fish & Game ("Department") under a variety of statutory provisions to promote and improve programs and opportunities for saltwater fishing with the intent that those programs will increase public access to marine recreational facilities. In particular, the Department is authorized to utilize public lands, with the consent of the public agency having care, custody and control of such lands, and to build docks, piers and parking areas that will accommodate the public's use and access to saltwater fishing venues. The Department is likewise authorized to transfer operation of such facilities to the public body already in control of the public lands.



**DISCUSSION:**

A Memorandum of Understanding (MOU), was approved by the Board of Directors on April 15, 2015 and further amended by the Board of Directors on April 18, 2018 to allow the Department to permit, design and construct a pier and 20-spot parking lot at Deer Island to be paid for by the Department. Under the most current MOU, the MWRA agreed to pay the associated costs with additional lighting and security improvements and design fees for that portion of the work. At that time, the preliminary estimate for MWRA’s portion of the project was \$260,000.

Provisions of Original MOU:

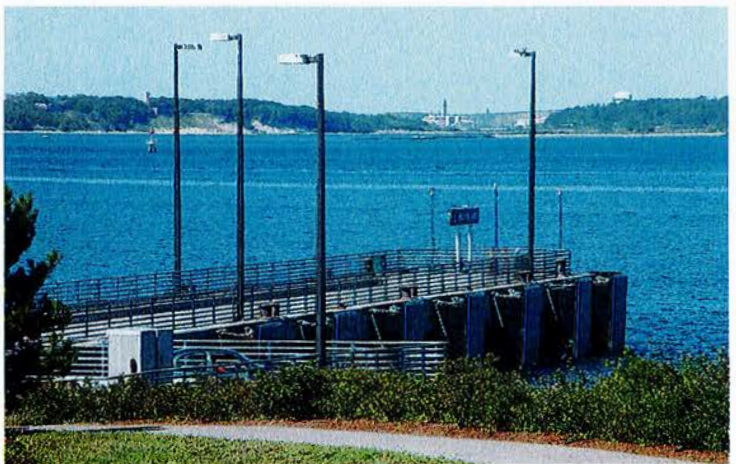
MWRA’s obligations under the original MOU, as operator of the pier, are minimal and do not involve the addition of or funding for personnel, equipment or supplies. MWRA’s principal responsibilities are to monitor and periodically report to the Department the condition of the pier and the need for repairs or maintenance. In addition, MWRA is responsible for on-site monitoring of uses of the pier to allow MWRA to advise the Department of uses or users who are not complying with the



*Similar Pier Installed in Oak Bluffs*

Department’s rules and regulations, all of which will be clearly posted on signage to be provided by the Department. It is MWRA’s expectation that its current practice with respect to the existing public access parking lot will be expanded to include trash removal from the pier and new parking area. MWRA maintains a similar fishing pier as part of the public access area at the Nut Island Headworks in Quincy and has found it to be well used and appreciated by the community.

The MOU also provides that neither MWRA nor the Department shall charge any fees to the public. Payment of a fee by a member of the public for access would allow lawsuits for injuries to be maintained against MWRA. Likewise, MWRA would not be involved in any way with monitoring whether users of the pier have obtained the appropriate fishing licenses or are complying with the Department’s rules and regulations. The MOU requires no active or daily monitoring of persons



*Nut Island Fishing Pier*



using the pier or associated parking as the pier is designed and intended to be “self-operating.” MWRA retains the right to temporarily close the pier should weather conditions or other factors cause MWRA to believe that public safety may be jeopardized.

Provisions of the First Amended MOU:

During permitting and design of the new facility, as a result of concerns raised at several public meetings, MWRA found it prudent to add lighting and security improvements to both the parking lot and pier. These additions are similar to and consistent with those provided at the public access lot at the entrance to Deer Island and at the Nut Island fishing pier in Quincy. Under the first amended MOU, the Department agreed to pay the costs associated with the pier and original 20-spot parking lot and MWRA agreed to pay the costs associated with the lighting and security improvements and the design fees associated with the MWRA enhancements. An estimate provided by the Department indicated that MWRA’s share of the project costs, as amended, would be \$245,790. The Department’s share of the estimated cost of the project was estimated at approximately \$1.1 million. In addition, MWRA agreed to be responsible for maintenance and utility costs associated with the electrical and security improvements.

Provisions of the Second Amended MOU:

The Department has competitively bid the contract and is ready to award the contract to the lowest responsible bidder. The bid for the entire project came in at \$2,186,545, with MWRA’s share of the costs set at \$323,160, associated with the lighting, security and design portions of the contract as defined in the First Amended MOU. The Department portion of the contract came in 71% higher than the engineer’s estimate due mostly to increased costs for manufactured steel due to increased tariffs and increased shipping costs. MWRA’s share of the cost was 31.5% higher.

**BUDGET/FISCAL IMPACT:**

The final FY19 CIP includes \$400,000 to construct the 20 additional access parking spaces, and install lighting and security improvements.

**ATTACHMENTS**

Proposed Amendment 2 to MOU with Department of Fish & Game  
Plan View of Pier Location

**Second Amended**  
**Memorandum of Understanding (MOU)**

**THIS SECOND AMENDED MOU** is entered into pursuant to the authority of G.L. c. 10 § 35NN, c. 130 § 17C and c. 21A, §§2(8) and 11B, and G.L. c. 10 § 35NN, c. 130 § 17C and c. 21A, §§2(8) and 11B on this \_\_\_\_\_ day of December 2018, by and among the Division of Marine Fisheries (“Division”) and Office of Fishing and Boating (“OFBA”) within the Massachusetts Department of Fish and Game (“Department”) collectively referred to herein as “MA Fisheries”, and by the Massachusetts Water Resources Authority (“MWRA”) pursuant to all applicable provisions of its enabling act, all parties collectively referred to as the “Parties”.

WHEREAS, the Parties desire to memorialize the obligations of each relative to the siting, funding, permitting, design, construction, maintenance, monitoring and operation of a proposed public access salt water fishing pier and associated parking facilities upon lands situated on Deer Island in the City of Boston currently owned by the Commonwealth of Massachusetts, and presently under the care, custody, and control of MWRA;

WHEREAS, MA Fisheries has proposed that a portion of the Deer Island site, as identified on the attached plan and which MWRA dedicates to open space and public access uses pursuant to the provisions of Chapter 658 of the Acts of 1986, be dedicated for public access and use as a fishing pier facility and for parking associated with the pier (the “Premises”);

WHEREAS, MWRA believes that the proposed uses of the Premises are consistent with and are a continuation of its existing open space and public access uses of the Deer Island site, do not represent any disposition of said open space/public access uses by MWRA, do not represent a change in use of the open space/public access portions of the Deer Island site, and therefore that no action or approval of the Massachusetts Legislature under Article 97 is required;

WHEREAS, in April 2015, the Parties entered into an MOU relative to the dedication of the Premises for public access and use as a salt water fishing pier and associated parking facilities;

WHEREAS, on May 18, 2018, the Parties entered into a First Amended MOU allocating responsibilities among the Parties for the costs of design, permitting, construction, improvement, repair, maintenance, monitoring, and operation of the salt water fishing pier and associated parking facilities to be located at the Premises;

WHEREAS, the Division of Marine Fisheries competitively bid a construction contract for the construction of the salt water fishing pier and associated parking facilities and received bids for the work, which exceeded the amount of the engineer's estimate resulting in an increase in the allocated costs to the Parties, as depicted in the First Amended MOU; and

WHEREAS, the Parties now wish to further amend and restate the MOU in order to allocate the current costs of construction and engineering for the salt water fishing pier and associated parking facilities.

NOW THEREFORE, in consideration of the allocation of responsibilities, as provided herein, among the Parties for the costs of design, permitting, construction, improvement, repair, maintenance, monitoring and operation of a fishing pier and associated area of twenty (20) parking spaces to be located at the Premises and in consideration of the mutual covenants contained herein, and for other good and valuable consideration the receipt and sufficiency of which are acknowledged by the Parties, each of the Department, OFBA, Division, and MWRA covenant and agree as follows:

1. Consent to Use of Public Access Property. Pursuant to the provisions of G.L. c. 21A, section 11B, MWRA hereby consents to the use of the Premises by MA Fisheries for a fishing pier and associated parking and both MWRA and MA Fisheries agree to the transfer to MWRA, the public entity having care, custody and control of the public access portions of Deer Island, of the limited monitoring and operational functions described in paragraph 5 hereof. It is understood and agreed that title to and ownership of the fishing pier structure shall be and remain

in the Department and that MA Fisheries entities shall undertake the obligations allocated to them hereunder.

2. Project Funding/MWRA Payment. The Division shall, subject to available funding, provide funds from the Marine Recreational Fisheries Development Fund to OFBA to pay all costs, except as hereinafter provided, necessary for the permitting, design, and construction of the fishing pier and shall pay 100% of the costs to permit, design and construct a total of twenty (20) parking spaces, all spaces intended by the Parties to be associated with and to be dedicated to the public's use of the fishing pier. However, MWRA shall remain responsible for the costs incurred to design and permit an additional twenty (20) parking spaces that were to have been devoted to general public access use but are no longer a component of this facility. In addition, MWRA shall be solely responsible for the costs of design, specification development, component costs and installation of the lighting and security facilities at both the pier and parking area consistent with the completed specifications for lighting and security items. MWRA further agrees to be solely responsible for the on-going costs of maintenance and necessary future replacement of said lighting and security facilities and for all utility costs to operate same.

The Division shall from time to time, subject to available funding, pay for and undertake any repairs, replacement or reconstruction of the fishing pier reasonably necessary to maintain those facilities in a constant condition of good repair, free of all known and obvious defects and conditions which would present an unreasonable risk of injury, loss or death to members of the visiting public. The Division, subject to available funding, and MWRA shall share equally in the costs of undertaking any repairs, replacement or reconstruction of the parking area reasonably necessary to maintain the parking facilities in a constant condition of good repair, free of all known and obvious defects and conditions which would present an unreasonable risk of injury, loss or death to members of the visiting public.

MWRA shall pay for its entire share of the project costs in a single lump sum upon completion of all work per a written itemized statement of account for same from MA Fisheries. As of the date of this Second Amended MOU, the agreed upon charges for all aspects of design and/or construction of all elements for which MWRA is to be responsible total approximately \$323,160, as itemized in the spreadsheet attached as **Exhibit 1**. MWRA's cost share is subject always to the actual amount allocable to MWRA based upon the final design and construction

costs for the completed project as determined by MA Fisheries, after review and comment by MWRA.

3. Signage. MA Fisheries shall provide the MWRA with a sign or signs which contain the provisions of MA Fisheries regulations (hereafter “Regulations”) governing the use of public access facilities (320 CMR 2.00), and a statement that the facilities were constructed by OFBA using funds provided by the Marine Recreational Fisheries Development Fund. The MWRA shall install and maintain any sign or signs provided by MA Fisheries in a prominent and visible location at the facilities. MWRA reserves the right to coordinate the placement of said signage with other signage presently in use at or around the public access entrance areas of Deer Island in a manner that will best direct the public’s attention to the Regulations associated with the fishing pier and associated parking spaces.

4. Periodic Maintenance, Repair and Inspection of Parking Facilities. MA Fisheries and MWRA shall devote sufficient funds from its annual legislative appropriations and budgets, to provide for the costs of annual maintenance, repairs and inspections which will be necessary to keep the entirety of the parking area in a constant condition of good repair, free of all known and obvious defects and conditions which would present an unreasonable risk of injury, loss or death to members of the visiting public.

5. Operation and Monitoring of the Parking and Fish Pier Facilities. The MWRA shall be responsible for funding and staffing which, in its sole discretion, it believes to be necessary for the operation and monitoring of the facilities which will be substantially self-operating in nature and will require no day-to-day active assistance from MWRA. As used herein, the term “operation and monitoring” shall include: (i) general oversight of the facilities and monitoring whether uses by the general public are in accordance with the Regulations, (ii) periodic trash and litter removal, (iii) snow and ice removal if the facilities, in the sole discretion of MWRA, will be open during winter months, and (iv) reasonable efforts to detect unsafe conditions, damage to, and/or the need for maintenance or repairs to the fishing pier structure or parking area. MWRA agrees that it shall notify MA Fisheries in the event that such conditions are observed in order to enable MA Fisheries to effect repairs pursuant to paragraphs 2 and 7 hereof. While MWRA shall have no obligation to enforce compliance with any provision of the Regulations, MWRA shall use reasonable efforts to bring repeated or chronic violations of the Regulations to the attention of MA Fisheries and/or appropriate law or code enforcement officials and to cooperate with said officials.

As used herein, the term “operation and monitoring” shall not require MWRA to: (i) charge or collect any license or admission fees from any user of the fishing pier, (ii) to issue or check for valid

licenses for fishing from the pier, (iii) to provide any assistance to members of the public in their use of the facilities, nor (iv) to provide any public safety/security services to users. Neither shall that term require MWRA to post any employee or assign any personnel at the facilities during any specific period(s) of time when the facilities are open to the public. MWRA reserves the right to temporarily close access to the fishing pier and associated parking area in the event that any condition, activity or needed repair at the pier or parking area presents a risk of injury or harm to the public.

6. Design, Construction and Installation of the Fishing Pier and Parking Area. MA Fisheries shall advance the funding of all expenses for and, subject to reimbursement by MWRA for its share of the costs as described in paragraph "2" hereof, shall be responsible for the permitting, design, installation, and construction on the Premises of the fishing pier and the parking as herein defined. MA Fisheries shall provide MWRA, at least 30 days in advance of the start of any construction of the parking facility or of the fish pier facility, with a full set of all plans, specifications, drawings and contract documents, which will be used in connection with the construction of those facilities. The design and construction of the facilities shall be in compliance with all applicable federal, state and local building codes and regulatory requirements. MA Fisheries shall provide MWRA, following the completion of any construction of the parking facility or of the fish pier facility, with a full set of as built plans and drawings for those finished facilities.

7. Maintenance, Repair and Inspection of the Fishing Pier. MA Fisheries shall devote sufficient funds from its annual legislative appropriations to provide for the costs of non-recurring maintenance, repairs and inspections which will be necessary to keep the fishing pier in a constant condition of good repair, free of all known and obvious defects and conditions which would present an unreasonable risk of injury, loss or death to members of the visiting public.

8. No Fees to be Charged. Neither any of the MA Fisheries agencies nor MWRA, either directly or through their agents or contractors, shall assess or collect from members of the public any fees, charges, assessments or other payment of any consideration in exchange for or as a condition of entry upon, admission to or use of any part or portions of the parking facility or fish pier facility. Each of the MA Fisheries agencies and MWRA desire to avoid exposure, responsibility and/or liability for claims of injuries or damage to or loss of property or any other damages, inclusive of claims for wrongful death, and wish to be protected from such claims by the provisions of G.L. c. 21, § 17C. It is the express intent of MWRA and of the MA Fisheries agencies that no signage or other written or verbal statements shall be made by any of the MA Fisheries agencies or by their respective employees, agents

or contractors that any fee, charge, assessment or other payment or consideration will be charged for admission to or use of the facilities by the public.

9. Management Measures. Subject to written approval of OFBA and the Division, MWRA may adopt reasonable management measures governing the use of the facilities that are not inconsistent with either the provisions of the Regulations or with other applicable management measures as adopted by MA Fisheries.

10. Third Party Claims and Lawsuits. It is the express intention of MA Fisheries, as the owner of the facilities, and MWRA, as the entity having care, custody and control of the public access property owned by the Commonwealth, that each reserves all rights, claims and defenses, including any claims against one another, which each may have in connection with any claims or lawsuits that may be brought against any of the Parties arising out of the public's use of the fishing pier and associated parking facilities, including the applicability of the provisions of G.L. c. 21, §17C.

11. Compliance With All Laws and Authorities; No Interference. MA Fisheries shall not interfere with any MWRA activities, operations, shipments or deliveries to or from Deer Island, nor will it, by any of its activities, cause MWRA to be unable to comply with those laws or the provisions of any of its permits with which it is required to remain in compliance. The MA Fisheries agencies shall observe and obey all reasonable MWRA safety and security directives applicable to any of MWRA's operations and activities at Deer Island.

12. Insurance. Prior to the entry upon the Premises by any contractor chosen to perform any work including design, construction, installation, repairs, maintenance, inspections and/or operation of the parking and fish pier facilities, said contractor shall provide MA Fisheries and MWRA with certificates of insurance coverage in such amounts and types as will protect both MWRA and the MA Fisheries agencies from the types of claims and risks of loss which could arise out of or result from said contractors operations, activities and facilities at Deer Island.

13. Term; Termination. This MOU shall be in effect for the useful life of the fishing pier facility or until mutually dissolved or modified in writing by the Department, Division, OFBA, and the MWRA.



**IN WITNESS WHEREOF**, the parties hereto have executed this Agreement on this \_\_\_\_ day of December, 2018.

---

Ronald S. Amidon, Commissioner  
Department of Fish and Game

---

David E. Pierce  
Director of the Division of Marine Fisheries

---

John P. Sheppard  
Director of the Office of Fishing and Boating

---

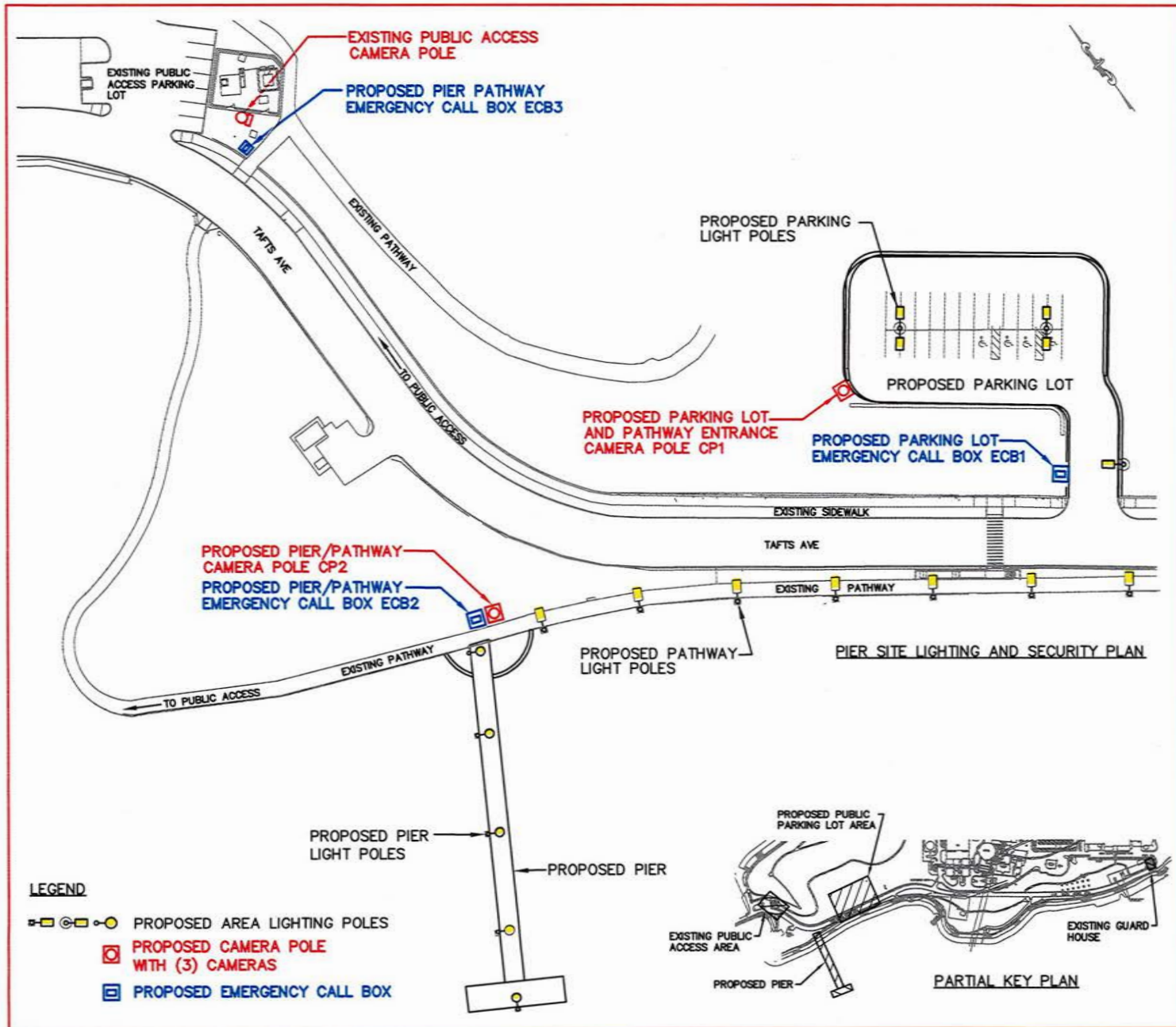
Frederick A. Laskey  
Executive Director, Massachusetts Water Resources  
Authority

**EXHIBIT 1 to Second Amended Memorandum of Understanding**


**Cost Estimate, As-Bid Costs & Breakdown**

Item No.	Quantity	Unit	Description	Office Estimate		ACK Marine		DMF	MWRA		
				Unit Price	Amount			DMF %	CLE DMF Amount	MWRA %	CLE MWRA Amount
101	1	Lump Sum	Clear & Grub	\$7,500.00	\$7,500.00	\$5,661.00	\$5,661.00	100%	\$5,661.00	0%	\$0.00
101.1	1	Lump Sum	Miscellaneous	\$10,000.00	\$10,000.00	\$19,250.00	\$19,250.00	100%	\$19,250.00	0%	\$0.00
112	1	Lump Sum	Demolition	\$15,000.00	\$15,000.00	\$6,907.00	\$6,907.00	100%	\$6,907.00	0%	\$0.00
120.2	1	Lump Sum	Excavation	\$20,000.00	\$20,000.00	\$80,061.00	\$80,061.00	100%	\$80,061.00	0%	\$0.00
151	2400	Ton	Gravel Borrow	\$30.00	\$72,000.00	\$62.00	\$148,800.00	100%	\$148,800.00	0%	\$0.00
201	1	Lump Sum	Drainage	\$30,000.00	\$30,000.00	\$47,221.00	\$47,221.00	100%	\$47,221.00	0%	\$0.00
460	445	Ton	Hot Mix Asphalt	\$100.00	\$44,500.00	\$154.00	\$68,530.00	100%	\$68,530.00	0%	\$0.00
470	300	Linear Foot	Bituminous Concrete Berm	\$10.00	\$3,000.00	\$11.00	\$3,300.00	100%	\$3,300.00	0%	\$0.00
501	60	Linear Foot	Granite Curb - Straight	\$45.00	\$2,700.00	\$56.00	\$3,360.00	100%	\$3,360.00	0%	\$0.00
501.1	70	Linear Foot	Grainite Curb - Curved	\$50.00	\$3,500.00	\$67.00	\$4,690.00	100%	\$4,690.00	0%	\$0.00
620	580	Linear Foot	Timber Guard Rail	\$40.00	\$23,200.00	\$58.00	\$33,640.00	100%	\$33,640.00	0%	\$0.00
620.1	60	Linear Foot	Steel Highway Guardrail	\$25.00	\$1,500.00	\$50.00	\$3,000.00	100%	\$3,000.00	0%	\$0.00
697	960	Linear Foot	Erosion Control	\$5.00	\$4,800.00	\$10.00	\$9,600.00	100%	\$9,600.00	0%	\$0.00
701.2	35	Square Yard	Concrete Wheelchair Ramp	\$120.00	\$4,200.00	\$38.00	\$1,330.00	100%	\$1,330.00	0%	\$0.00
765	1	Lump Sum	Seeding	\$2,500.00	\$2,500.00	\$9,172.00	\$9,172.00	100%	\$9,172.00	0%	\$0.00
820	1	Lump Sum	Site Lighting and Security	\$220,000.00	\$220,000.00	\$304,160.00	\$304,160.00	0%	\$0.00	100%	\$304,160.00
860	1	Lump Sum	Pavement Marking and Signage	\$2,000.00	\$2,000.00	\$4,642.00	\$4,642.00	100%	\$4,642.00	0%	\$0.00
904	1	Lump Sum	ADA Compliant Ramp & Stairs	\$50,000.00	\$50,000.00	\$134,328.00	\$134,328.00	100%	\$134,328.00	0%	\$0.00
904.1	9	Cubic Yard	Concrete	\$500.00	\$4,500.00	\$2,555.00	\$22,995.00	100%	\$22,995.00	0%	\$0.00
940	2035	Linear Foot	Steel Pipe Piles	\$130.00	\$264,550.00	\$298.00	\$606,430.00	100%	\$606,430.00	0%	\$0.00
955	1	Lump Sum	Timber	\$420,000.00	\$420,000.00	\$470,180.00	\$470,180.00	100%	\$470,180.00	0%	\$0.00
982	1	Lump Sum	Marine Hardware & Railings	\$120,000.00	\$120,000.00	\$199,288.00	\$199,288.00	100%	\$199,288.00	0%	\$0.00
					<b>\$1,325,450.00</b>		<b>\$2,186,545.00</b>		<b>\$1,882,385.00</b>		<b>\$304,160.00</b>

The total dollar value is \$2,186,545 with MWRA's portion at \$304,160+\$19,000 for engineering = \$323,160 total.



**STAFF SUMMARY**

**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director   
**DATE:** December 19, 2018  
**SUBJECT:** Refurbishment of Secondary Reactor Aerator and Mixer Gearboxes at the Deer Island Treatment Plant  
SPX Corporation  
Bid WRA-4594

**COMMITTEE:** Wastewater Policy & Oversight

           INFORMATION  
  X   VOTE

  
Michele S. Gillen

Director of Administration

David F. Duest, Director, Deer Island WWTP  
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-4594 for the refurbishment of secondary reactor aerator and mixer gearboxes at the Deer Island Treatment Plant to the lowest responsive bidder, SPX Corporation, and to authorize the Executive Director, on behalf of the Authority, to execute said purchase order in an amount not to exceed \$885,936 for a period of three years from December 19, 2018 through December 18, 2021.

**DISCUSSION:**

The Cryogenic Facility at the Deer Island Treatment Plant provides pure oxygen to the secondary reactors' headspace to promote biological treatment of primary effluent. The reactor aerators are similar to large mixers that dissolve pure oxygen into the reactor liquid, which is often referred to as "mixed liquor." The secondary clarifiers remove the sludge generated by the reactors' biological processes.

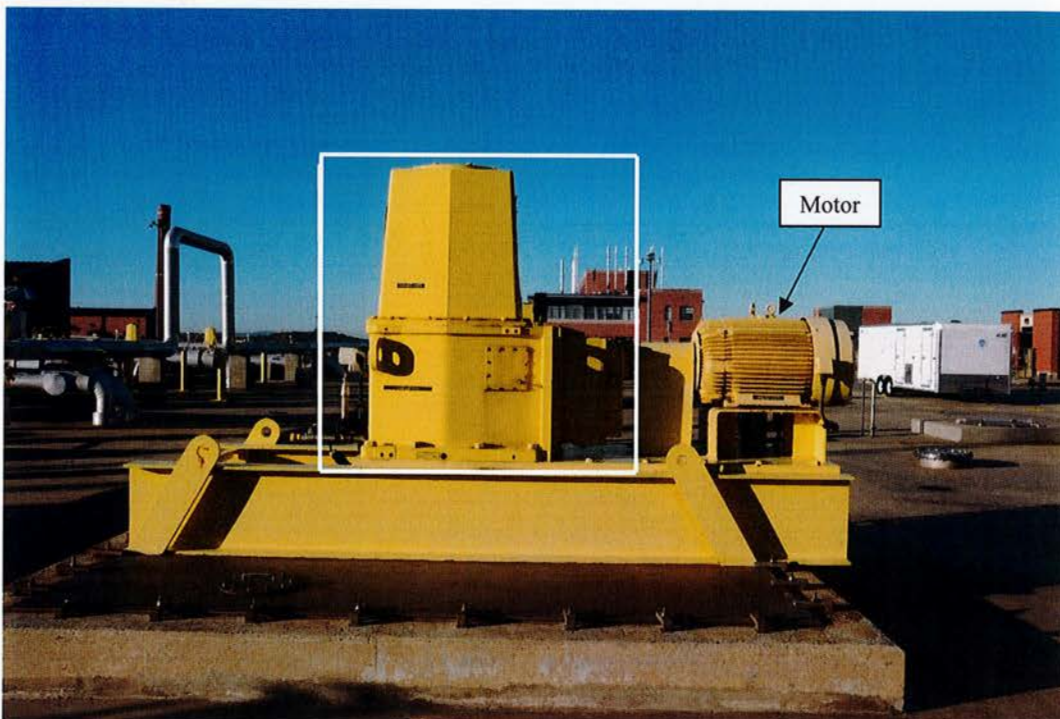
Secondary Reactor Batteries A, B, and C contain a total of nine aerator trains (each aerator train has four aerators and four mixers). Each aerator and each mixer has a triple reduction gearbox and mixing blade. In total, there are 72 gearboxes that drive 36 aerators and 36 mixers. The gearboxes transmit power from the aerator/mixer motors to the aerator/mixer blades. Although all of the gearboxes look very similar, the gearboxes for the mixers and the aerators are of differing horsepower (HP): 50-HP, 100-HP, and 150-HP.



The picture below shows the arrangement of most of the gearboxes and motors for the aerators and mixers spread out across the top of Secondary Reactor Battery C.



The picture below shows a close-up view of one of the 150-horsepower aerator gearboxes (outlined).







*Picture depicts the top of one of the aerator/mixer shafts where it connects with the triple-reduction gearbox*

The secondary reactor batteries were brought on line in phases, beginning with Battery A in 1997, followed by Battery B in 1998, and Battery C in 2001. They operate 24 hours per day, seven days per week, every day of the year. Current plant protocol utilizes six out of nine aerator trains operating at any given time. This heavy duty use, coupled with exposure to the exterior influences of the ocean air, results in occasional and expected failures. A failure of any one aerator or mixer could result in the loss of an entire aerator train.

MWRA utilizes a condition-monitoring program as part of its maintenance protocols. Staff perform semi-annual inspections on all of the gearboxes, which include oil analysis and acoustic ultrasound testing of the gears and bearings. Staff also perform corrective tasks as required, including greasing and re-alignment. However, when condition monitoring indicates negative trending and the potential for failure in service, staff remove the gearbox and ship it to a contracted repair site for complete refurbishment back to original operational parameters. The refurbished unit is then shipped back to Deer Island where MWRA staff reinstall it.

The average expected service life of the gearboxes is approximately 11 years. Since the last contract was issued in 2014, 18 of these gearboxes have been rebuilt (6-50HP, 10-100HP, and 2-150HP). Refurbishment requires a complete teardown and inspection of all components, and the vendor provides MWRA with a written report describing the issues found and repairs needed. In addition to making the required repairs, the vendor rebuilds the gearbox with new bearings and seals, and a new protective coating of paint. If gearing is identified as failing, it also is replaced as part of the rebuild in accordance with the unit bid pricing schedule described below.



Staff estimate that, based upon previous experience, approximately six to 10 gearboxes will require refurbishment each year for the next three years.

### Procurement Process

Bid WRA-4594 was advertised in the following publications: Boston Herald, Goods & Services Bulletin, El Mundo, and Banner Publications. In addition, bids were made available for public downloading on MWRA's e-procurement system (Event 3614) and five potential bidders were solicited through the e-Portal.

On November 6, 2018, Event 3614 closed with the following results:

VENDOR	BID PRICE
<b>SPX Corporation</b>	<b>\$885,936.00</b>
Associated Electro-Mechanics, Inc.	\$1,688,560.86

SPX Corporation was the successful low bidder on MWRA's previous three contracts for gearbox refurbishments. As mentioned above, there are three different-sized gearboxes. For purposes of comparison of bids, staff used an estimate of 14 gearboxes, 6 each of the 50-HP, 6 each of the 100-HP, and 2 each of the 150-HP. Based on those estimates, SPX's current total bid price for each is \$52,699, \$64,379, and \$91,734, respectively. Under the previous four-year contract with SPX Corporation, which expired on November 12, 2018, MWRA paid \$41,818, 51,364, and \$76,701 respectively. However, it should be noted bid prices are considered "worst case scenarios" that include all new gearing. Gearing and certain other components were bid as separate, alternate-option line items to establish a contract unit price. The extent of each refurbishment is not known until the unit is completely dismantled and inspected. There have been instances where gears, pinions and other parts are found to still be within acceptable tolerances and the final refurbishment cost is much less than the total bid prices listed above. As mentioned above, MWRA staff receive a copy of a service report, along with pictures and recommendations (see example above), and no work is completed without the consent of MWRA staff, ensuring that only necessary work is performed.



*From Vendor's report, low-speed gear found with good wear pattern, suitable for reuse*

Although the recommended not-to-exceed amount of this contract is based upon the worst case scenario bid prices, it is possible that MWRA would be able to refurbish additional gearboxes, if required, and not all gearboxes require complete gearing.



Staff have been satisfied with all previous work performed by SPX Corporation. SPX is the original equipment manufacturer. After reviewing the bids, staff recommend the award of this contract to SPX Corporation, as the lowest responsive bidder. SPX is a world-wide company with more than 85 years of experience servicing gearboxes. They have the specialized tools, machine shop, trained staff and expertise to handle any type of overhaul and guarantee the work.

**BUDGET/FISCAL IMPACT:**

The FY19 CEB includes sufficient funds for the first portion of this contract. Appropriate funding for the remaining term of the contract will be included in subsequent CEB requests.

**MBE/WBE PARTICIPATION:**

SPX Corporation is not a certified Minority- or Women-owned business.



# 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:* M. Beaton  
*Vice-Chair:* J. Carroll  
*Secretary:* A. Pappastergion  
*Board Members:*  
K. Cotter  
P. Flanagan  
J. Foti  
B. Peña  
H. Vitale  
J. Walsh  
J. Wolowicz

to be held on

Wednesday, December 19, 2018

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. PCR Amendments – December 2018 (ref. P&C A.1)
    2. Appointment of Budget Director, Finance (ref. P&C A.2)
    3. Appointment of Chief Engineer, Engineering & Construction (ref. P&C A.3)
    4. Appointment of Assistant Director, Engineering & Construction (ref. P&C A.4)
    5. Appointment of Manager of Design, Tunnel Redundancy (ref. P&C A.5)
    6. Appointment of Manager, Geotechnical and Tunneling, Tunnel Redundancy (ref. P&C A.6)

7. Transmittal of the FY2020 Proposed Capital Improvement Program to The MWRA Advisory Board (ref. AF&A B)
8. Approval of Two New Members of the Wastewater Advisory Committee (ref. WW B.1)
9. Approval of Amendment 2 to Memorandum of Understanding with Massachusetts Department of Fish and Game for Public Access Fishing Pier at Deer Island (ref. WW B.2)

**B. Contract Awards**

1. John J. Carroll Water Treatment Plant SCADA System Improvements, Design, Engineering Services During Construction and Resident Engineering Services: Arcadis U.S., Inc., Contract 7581 (ref. W B.1)
2. Intermediate High Water Pipeline Improvements, Design and Engineering Services During Construction: CDM Smith Inc., Contract 6955 (ref. W B.2)
3. Security Guard Services for Various MWRA Facilities: Universal Protection Services, LLC, d/b/a Allied Services, Contract EXE-041 ref. AF&A C.1)
4. Refurbishment of Secondary Reactor Aerator and Mixer Gearboxes at The Deer Island Treatment Plant: SPX Corporation, Bid WRA-4594 (ref. WW C.1)

**C. Contract Amendments/Change Orders**

1. Northern Intermediate High Redundant Pipeline Design, Construction and Resident Inspection Services: Stantec Consulting Services, Inc., Contract 6906, Amendment 3 (ref. W C.1)
2. Managed Security Services, NWN Corporation, Contract 7499, Amendment 1 (ref. AF&A D.1)

**V. OTHER BUSINESS**

**VI. CORRESPONDENCE TO THE BOARD**

**VII. EXECUTIVE SESSION**

A. Litigation:

1. CSO Assessment – U.S. v. M.D.C., et al., USDC No. 85-0489-RGS
2. Update on DaPrato v. MWRA

B. Security:

1. Update on Cyber Security

**VIII. ADJOURNMENT**

## **MASSACHUSETTS WATER RESOURCES AUTHORITY**

### **Meeting of the Board of Directors**

**November 14, 2018**

A meeting of the Board of Directors of the Massachusetts Water Resources Authority was held on Wednesday, November 14, 2018 at the Authority headquarters in Charlestown. Chair Beaton presided. Present from the Board were Ms. Wolowicz and Messrs. Carroll, Cotter, Flanagan, Foti, Pappastergion, Peña, Vitale and Walsh. 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, Sean Navin, Director, Intergovernmental Affairs, Bethany Card, Director, Environmental and Regulatory Affairs, Katherine Ronan, Public Affairs, Ria Convery, Assistant Secretary, and Kristin MacDougall, Assistant to the Board of Directors. The meeting was called to order at 1:09 p.m.

### **APPROVAL OF OCTOBER 17, 2018 MINUTES**

Upon a motion duly made and seconded, it was

Voted: to approve the minutes of the Board of Directors' meeting of October 17, 2018 as presented and filed with the records of the meeting.

### **REPORT OF THE CHAIR**

Chair Beaton reported on the progress of the gas line restoration efforts in the Merrimack Valley. He recognized the countless men and women who are working 24 hours a day, 7 days a week to restore safe natural gas service and to provide other essential services to affected residents and businesses.

### **REPORT OF THE EXECUTIVE DIRECTOR**

Mr. Laskey recognized MWRA Budget Director Kathy Soni and wished her well in her upcoming retirement. He invited staff to present an update on 2018's above-average rainfall and its impact on MWRA's water and wastewater systems. (Mr. Foti briefly left the meeting and returned during the presentation.) Mr. Laskey also made a

presentation on the status of the Aqueduct Trails program; he thanked the Department of Conservation and Recreation and the MWRA Board of Directors for their support. He also briefly noted the status of the DaPrato appeal and Outfall Monitoring Science Advisory Panel activities.

## APPROVALS

### PCR Amendments – November 2018

Upon a motion duly made and seconded, it was

Voted: to approve amendments to the Position Control Register (PCR) for November 2018 as presented and filed with the records of the meeting.

### Appointment of Business Systems Analyst III, MIS Department

Upon a motion duly made and seconded, it was

Voted: to approve the appointment of Mr. Patrick Li to the position of Business Systems Analyst III (Unit 6, Grade 12), in the MIS Department, at an annual salary of \$113,864.09, commencing on a date to be determined by the Executive Director.

### Appointment of Budget Manager, Finance Division

Upon a motion duly made and seconded, it was

Voted: to approve the appointment of Mr. Michael Cole, Jr. to the position of Budget Manager, Finance Division (Non-Union, Grade 14) at an annual salary of \$117,300, commencing on a date to be determined by the Executive Director.

### Appointment of Manager, Finance and Administration, Operations Division

Upon a motion duly made and seconded, it was

Voted: to approve the appointment of Mr. Christopher Lam to the position of Manager, Finance and Administration (Unit 6, Grade 12), at an annual salary of \$113,864.09 commencing on a date to be determined by the Executive Director.

### Approval of Seventy-Ninth Supplemental Bond Resolution



Upon a motion duly made and seconded, it was

Voted: to adopt the Seventy-Ninth Supplemental Resolution authorizing the issuance of up to \$55,000,000 of Massachusetts Water Resources Authority Subordinated General Revenue Bonds and the supporting issuance resolution.

Memoranda of Understanding Between MWRA and Eversource, Eversource Gas Company and Western Massachusetts Electric Company (Northeast Utilities Companies), and National Grid

Upon a motion duly made and seconded, it was

Voted: to authorize the Executive Director, on behalf of the Authority, to execute non-binding Memoranda of Understanding with Eversource Electric Company, Eversource Gas Company and Western Massachusetts Electric Company (Northeast Utilities Companies, collectively referred to as Eversource) and National Grid, substantially in the forms as presented and filed with the records of the meeting.

CONTRACT AWARDS

Technical Consulting Services to Implement Upgrades to the Water Quality Reporting System: Overture Partners, LLC, Bid WRA-4572Q, State Contract ITS63 Cat 2b

Upon a motion duly made and seconded, it was

Voted: to approve the award of Purchase Order Contract WRA-4572Q for technical consulting services to implement upgrades to the Water Quality Reporting System, to the lowest responsive bidder, Overture Partners, LLC, and to authorize the Executive Director to execute said purchase order contract in an amount not to exceed \$309,248.96 under State Contract ITS63 Cat2b, for a term not to exceed two years.

Purchase of New Desktop Computers, Imaging and Deployment Services: Hub Technical Services LLC, Bid WRA-4586Q, State Contract #ITC47

Upon a motion duly made and seconded, it was

Voted: to approve the award of a purchase order for the purchase of 902 standard HP EliteDesk 800 desktop computers, 52 high performance HP Z2 Mini

desktop computers, and imaging and deployment services to the lowest responsive bidder under Bid WRA-4586Q, Hub Technical Services LLC, and authorize the Executive Director to execute said purchase order in the bid amount of \$1,260,579.56 under State Contract ITC47.

CONTRACT AMENDMENTS/CHANGE ORDERS

Chelsea Creek Headworks Upgrade, BHD/BEC 2015, A Joint Venture, Contract 7161, Change Order 22

Upon a motion duly made and seconded, it was

Voted: to authorize the Executive Director, on behalf of the Authority, to approve Change Order 22 to Contract 7161, Chelsea Creek Headworks Upgrade, with BHD/BEC 2015, A Joint Venture, for an amount not to exceed \$182,792.00, increasing the contract amount from \$79,954,968.46 to \$80,137,760.46, 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.

Northern Intermediate High Section 110 – Stoneham, Albanese D&S Inc., Contract 7067, Change Order 3

Upon a motion duly made and seconded, it was

Voted: to authorize the Executive Director, on behalf of the Authority, to approve Change Order 3 to Contract 7067, Northern Intermediate High Section 110 Stoneham, with Albanese D&S Inc., for an amount not to exceed \$283,500, increasing the contract amount from \$23,107,300 to \$23,390,800, with no increase in contract term.

Further, to authorize the Executive Director to approve additional change orders as may be needed to Contract 7067 in an amount not to exceed the aggregate of \$250,000, in accordance with the Management Policies and Procedures of the Board of Directors.

The meeting adjourned at 1:23 p.m.

Approved: December 19, 2018

Attest:

\_\_\_\_\_  
Andrew M. Pappastergion, Secretary