MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

On

Key Indicators of MWRA Performance

For

First Quarter FY2018

Q1	Q2	Q3	Q4
■			

Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer
November 15, 2017

Board of Directors Report on Key Indicators of MWRA Performance

First Quarter FY18

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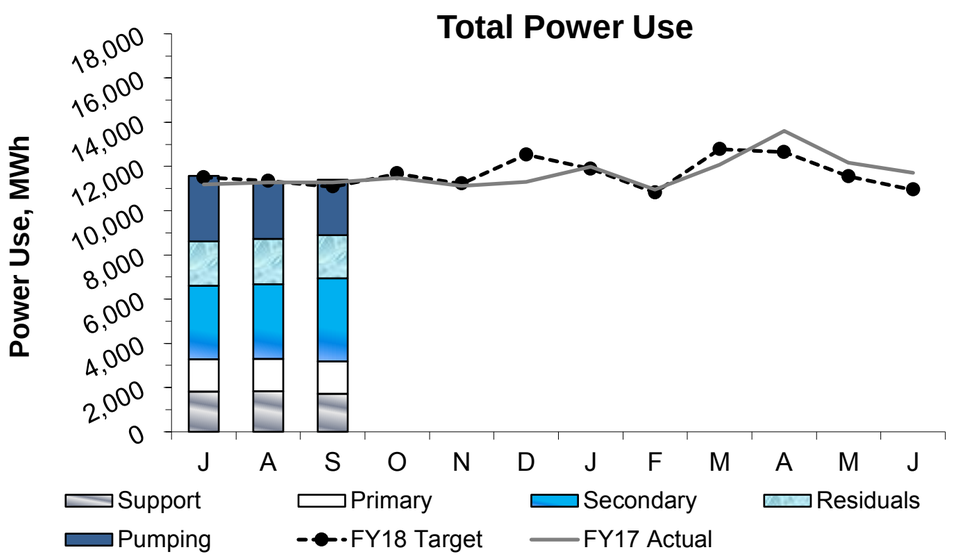
This quarterly report is prepared by MWRA staff to track a variety of MWRA performance measures for routine review by MWRA's board of directors. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for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

Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer

OPERATIONS AND MAINTENANCE

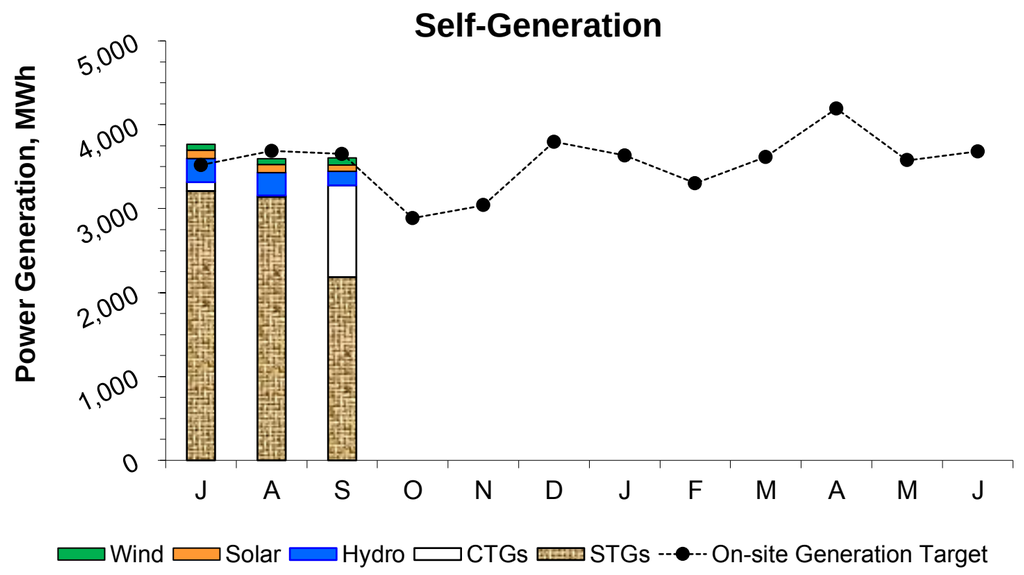
Deer Island Operations

1st Quarter - FY18

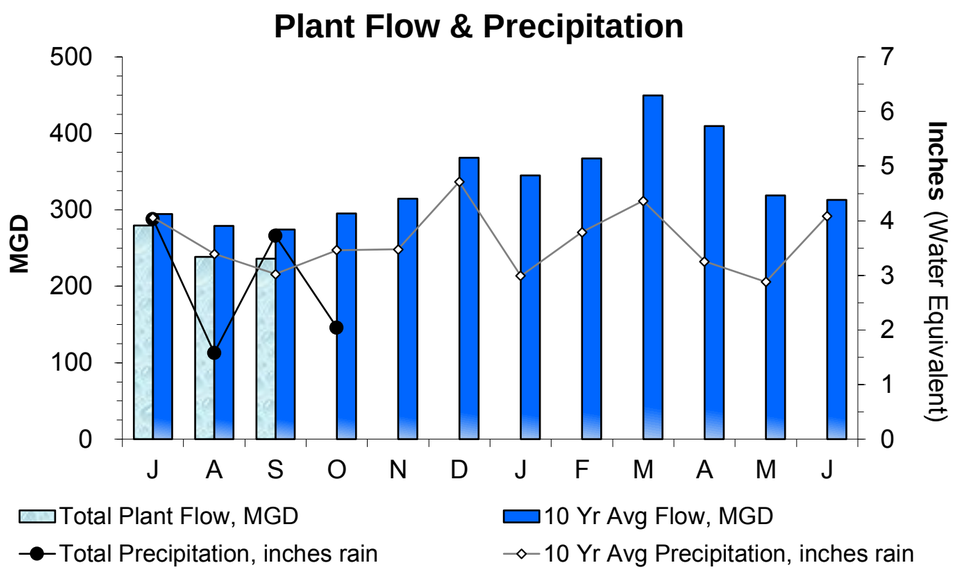


Total power usage in the 1st Quarter was on target (+1.0%) even though Total Plant Flow was 11.0% below target with the 3 year average plant flow. All processes were on or below target this quarter, except for secondary treatment. Due to an increased demand for oxygen during the lower flow summer months, the on-island storage of liquid oxygen needed to be replenished, resulting in a 9.4% variance above targeted energy use in the Cryogenic Oxygen Generation Facility, and a 5.4% increase in overall energy used in secondary treatment.

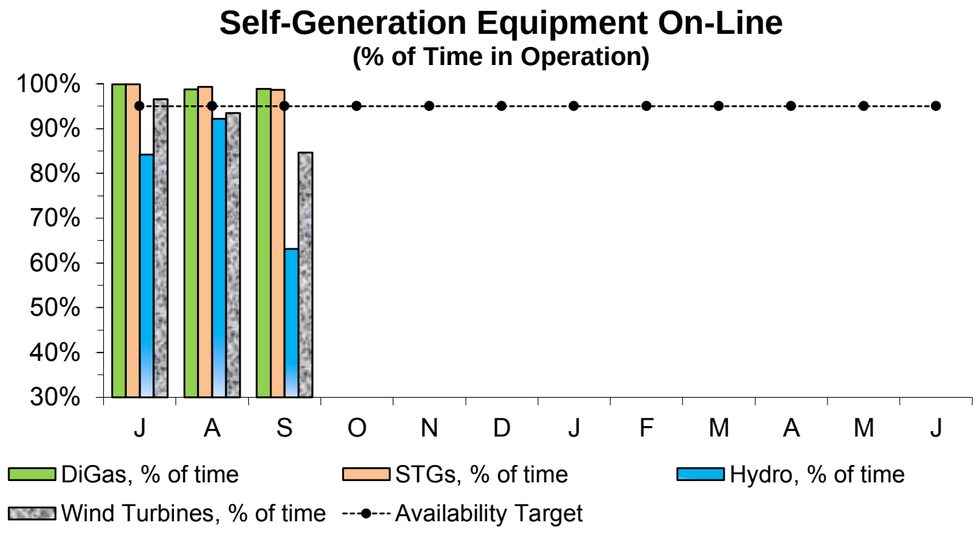
Note: Power usage projections are based on 3 year averages.



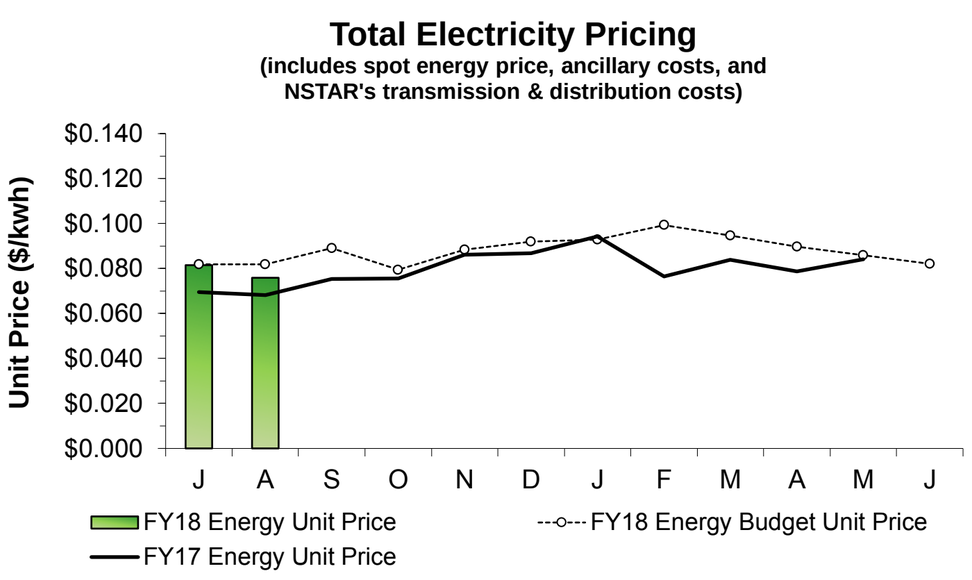
Power generated on-site during the 1st Quarter was on target (+1.0%). Generation by the STGs, CTGs, and Solar met or exceeded their targets. CTG Generation was more than 3 times higher than target due to Eversource maintenance work which required continuous CTG operation for five (5) days in September. Generation by the Hydro Turbines was 33.7% below target as a result of below target plant flow, several mechanical issues, as well as higher tail water levels caused by low plant flow. Wind Turbine generation was 11.0% below target, due to lower generation in July even though wind turbine availability was above target during that month. The average wind speed this July was lower than the historical wind speed for July.



Total Plant Flow for the 1st Quarter was 11.0% below target with the 10 year average plant flow (251.3 MGD actual vs. 282.6 MGD expected) as precipitation for the quarter was 10.8% lower than target (9.34 inches actual vs. 10.47 inches expected).

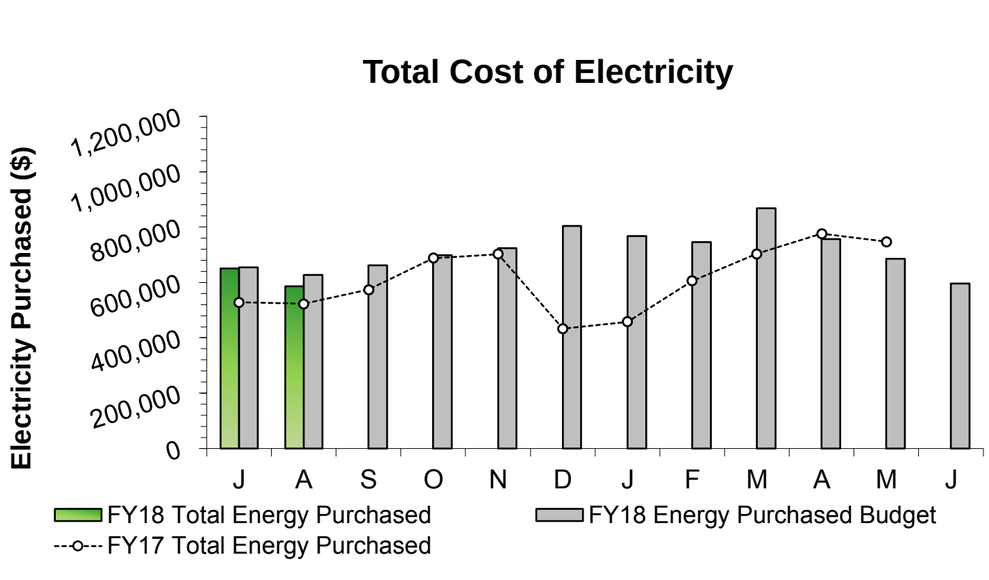


The DiGas system and the STGs exceeded the 95% availability target for the 1st Quarter. Wind Turbine availability fell below target by 3.4% as Turbine #1 was offline for several days for a hydraulic pump repair, as well as for the replacement of the main power cable. The Hydro Turbines fell 20.2% below target due to several mechanical issues, as well as a higher tail water level caused by the infiltration of the outfall with salt water resulting in the turbine tripping offline more readily during periods of high tide.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Price in the 1st Quarter, through August (the most current invoice available) was 3.9% lower than budget. The actual total energy unit price in September is not yet available as the complete invoice has not been received. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

Note: Only the actual energy prices are reported. Therefore, the dataset lags by one (1) month due to the timing of invoice receipt and review.

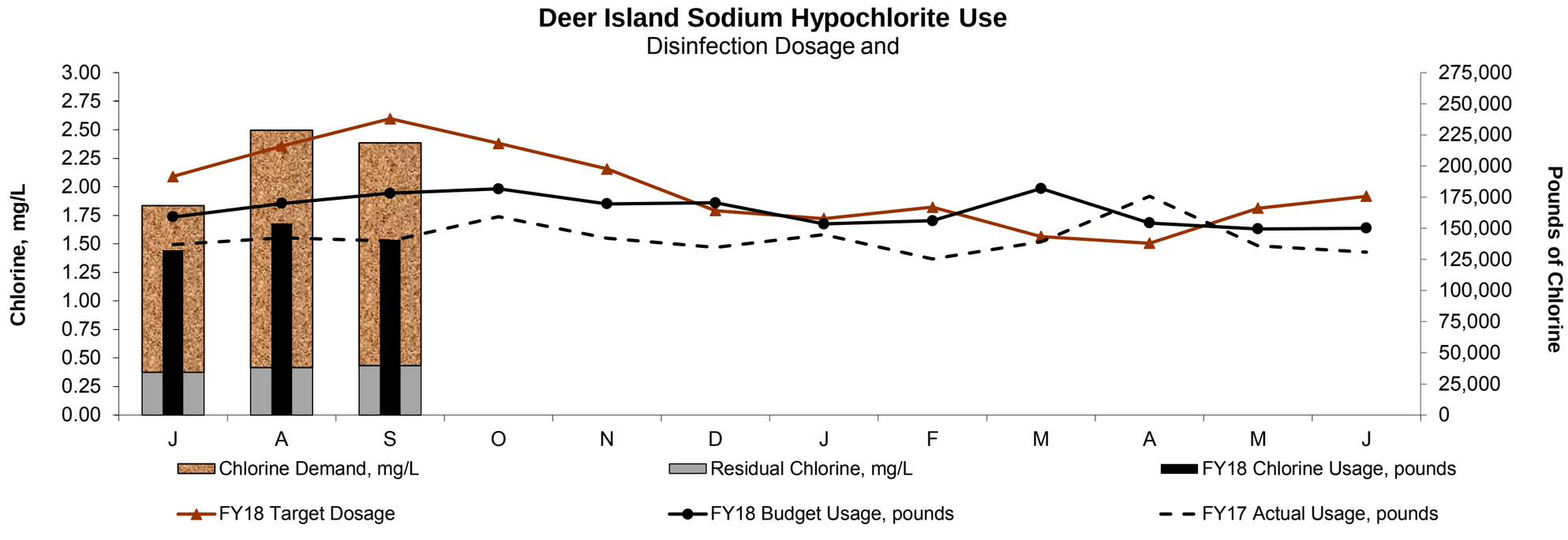


The invoices for the total cost of Electricity Purchased for September hasnot been received as of reporting time. The total cost of Electricity Purchased during the 1st Quarter (July and August data only) was 3.4% lower than budget as the Total Energy Unit Price is lower than budgeted by 3.9%, and the Total Electricity Purchased is on target (+0.4%) through August.

Note: Only months with complete Electricity Purchased data are reported. Therefore, the dataset lags by one (1) month due to the timing of invoice receipt and review.

Deer Island Operations

1st Quarter - FY18



The disinfection dosing rate in the 1st Quarter was 4.7% below the target. DITP maintained an average disinfection chlorine residual of 0.41 mg/L this quarter with an average dosing rate of 2.24 mg/L (as chlorine demand was 1.83 mg/L). Actual sodium hypochlorite usage in pounds of chlorine was 15.8% below target this quarter due to lower chlorine demand and the lower plant flow.

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

Secondary Blending Events

Month	Count of Blending Events	Count of Blending Events Due to Rain	Count of Blending Events Due to Non-Rain-Related Events	Secondary, as a Percent of Total Plant Flow	Total Hours Blended During Month
J	2	2	0	99.5%	7.51
A	0	0	0	100.0%	0.00
S	1	1	0	99.98%	1.36
O					
N					
D					
J					
F					
M					
A					
M					
J					
Total	3	3	0	99.8%	8.88

99.8% of all flows were treated at full secondary during the 1st Quarter. There were a total of three (3) separate secondary blending events; all due to high plant flow resulting from heavy rain. The three (3) combined blending events resulted in a total of 8.88 hours of blending and 47.61 Mgal of primary-only treated effluent with secondary effluent. The Maximum Secondary Capacity for the entire quarter was 700 MGD.

Secondary permit limits were met at all times during the 1st Quarter.

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved an instantaneous peak flow rate of 933.6 MGD in the early evening on July 24. This peak flow occurred during a rain event that produced 1.42 inches of precipitation. Overall, Total Plant Flow for Quarter 1 was 11.0% below target with the 10 year average plant flow target for the month.

Essential maintenance and rehabilitation activities involving the replacement of butterfly flow control valves, discharge isolation valves, flow meters, and associated piping for each of the 10 wastewater pumps in the North Main Pump Station (NMPS) and each of the pumps in the Winthrop Terminal Headworks Facility were completed in September. All equipment was original and dated back to the facility upgrades in 1995. Over time, the valves in these facilities have sustained damage from age and wear and needed to be replaced to allow proper isolation of pumps and equipment for maintenance. A total of 45 force main isolation events occurred from September 2015 through September 2017, including eight (8) full NMPS shutdowns, to complete the scope of this project. In September a final north system NMPS shutdown was conducted to allow the contractors to remove all of their temporary equipment.

Deer Island Operations & Maintenance Report (continued)

Environmental/Pumping (continued):
On July 19 and July 26, all south system influent flows were sent to South System Pump Station (SSPS) pumps #5 to #8 (servicing wet well #2) for approximately 12 hours in order to isolate pumps #1 to #4, to allow contractors to complete repairs on the check valve dashpot on SSPS pump #3. Once the work was completed at the end of each day, pumps #1 to #4 were returned to operational status with the exception of pump #3 which was out service from July 19 to July 26. No interruptions in flow occurred during this work.

Secondary Treatment:
Significant essential maintenance work on Secondary Treatment Batteries A, B, and C took place in July and August. The return sludge ("RSL") header isolation valves in the secondary batteries have suffered wear and corrosion damage and were scheduled for replacement. Because the secondary batteries cannot operate without the return sludge header for more than several hours, each battery was removed from service, one at a time, while the associated valves were replaced. Secondary Battery B was the first battery scheduled for this RSL valve replacement work, followed by Secondary Batteries A and C. In addition, the contractor replaced scum system hardware in the effluent channel of Secondary Batteries A and B during their respective shutdowns. Secondary Battery C did not require this work. The contractor worked 24 hours per day to minimize the shutdown of the battery to preserve the microbiology in the Secondary Battery reactors. During each Secondary Battery shut down, the primary effluent flow was treated by the two remaining Secondary Batteries.

Odor Control:
The Residuals Odor Control (ROC) Facility, which is responsible for treating the process airflows from the Primary Gravity Thickeners (GT) and the Secondary Centrifuge Thickeners (CT), was shutdown on August 30 and on September 6. These shutdowns were necessary to allow for scheduled maintenance to remove the fan assembly for Fan 3 and to reconnect the fan assembly to the treatment system following the rebuild of this fan assembly. These airflow shutdowns allowed staff to safely work on this fan without the risk of potential exposure to the process air. Process air was contained within the building during these shutdowns and there were no odor complaints associated with this work.

Energy and Thermal Power Plant:
Overall, total power generated on-site accounted for 32.0% of Deer Island's total power use for the quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 28.5% of Deer Island's total electrical power use for the quarter.

The annual maintenance at the Thermal Power Plant took place starting on September 24 and continued into October 4. Various maintenance activities on both Steam Turbine Generators (STGs), the two Zurn boilers, and the common systems occurred and involved maintenance on various pumps, valves, and instruments throughout the power plant. On September 24, the main STG were taken out of service for maintenance while Boiler 201 and the BP-STG remained in operation. The BP-STG was operated at maximum capacity to minimize the loss of power generation during this period when the main STG was out of service. Boiler 201 and the BP-STG were then also taken out of service on October 1 (shutdown of the entire Thermal Power Plant) to allow for maintenance on these units and on the common systems including the steam, condensate, and feed water systems. Boiler 101 and the BP-STG were returned to operation during the very early morning of October 4 followed by the operation of the main STG later in the evening.

Regulatory:
Emissions compliance testing for the Residuals Odor Control (ROC) treatment system at DITP was conducted by consultants on June 26 to June 27 and on August 21 to August 22. The ROC system treats combined process air from the Primary Gravity Thickeners (GT) and the Secondary Centrifuge Thickeners (CT). The DITP Air Quality Operating Permit issued by the MA DEP requires that DITP conduct emissions compliance testing for the various emission units once every five (5) years to demonstrate compliance with applicable total reduced sulfur (TRS) and non-methane hydrocarbon (NMHC) emission limits. This testing requires the continuous emissions monitoring of the inlet and outlet of the odor control system over a 24-hour period for TRS at the outlet (stack) of the odor control system and for NMHC at the inlet. All emissions test results show that DITP was in compliance. The final report summarizing the test results was reviewed by staff and submitted to the MA DEP on August 30.

A representative from the MA DEP was on site at the DITP on September 20 for an unannounced (annual) site visit of the treatment plant to review and inspect the plant's wastewater treatment operations and practices. The MA DEP representative was given a comprehensive plant tour covering the entire wastewater and residuals treatment facilities and process areas. Initial communications indicate the inspection had gone well and no issues were raised by the DEP representative.

Clinton AWWTP:
Phosphorus Reduction Facility, Work completed or in progress during the first quarter:

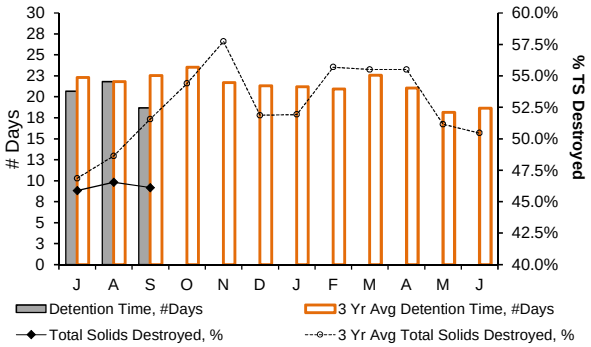
- Construction of diversion structure and slide gate installation. Conducted hydraulic leak testing.
- Completed installation of level sensors in existing tanks.
- Plumbing contractor completed installation of natural gas regulators and meters.
- Existing plant water system was demolished in preparation of the installation of a new system.
- Roof coping, aluminum paneling, door installation, glazing and louver installation was completed.
- Placed pavement at new driveway.
- Contractors installed new air intake fans at Headworks and Dewatering buildings.
- Began wet testing phosphorus reduction facility on September 21, 2017.

On September 21, 2017, Mass. Department of Environmental Protection (MassDEP) conducted a compliance inspection of the Clinton AWWTP. Prior to the inspection, MassDEP toured the newly constructed phosphorus reduction facility and witnessed part of the two day wet test carried out by MWRA, Stantec (design engineer) and WESTech (Disc filter engineers).

Deer Island Operations and Residuals

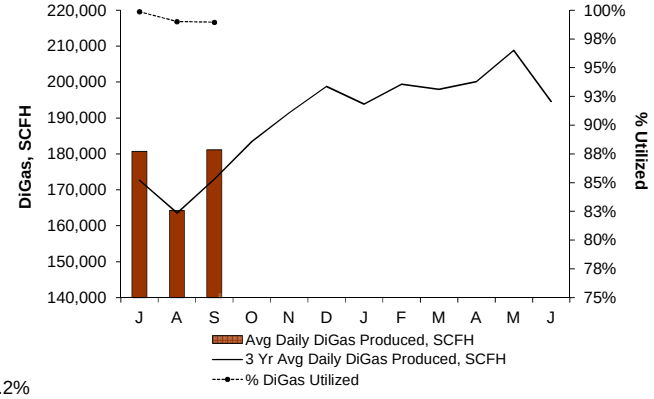
1st Quarter - FY18

Sludge Detention Time in Digesters and Total Solids Destruction



Total solids (TS) destruction following anaerobic sludge digestion averaged 46.2% during the 1st Quarter, 2.8% below target with the 3 year average of 49.0% for the same period, as the sludge detention time in the digesters was 20.4 days. DI operated with an average of 7.8 digesters during the 1st Quarter, on target with the 3 year average. TS destruction is lower than target due to routine maintenance activities rotating through the digesters starting in August which results in the shifting of sludge feed to the remaining online digesters.

Digester Gas Production and % Utilized



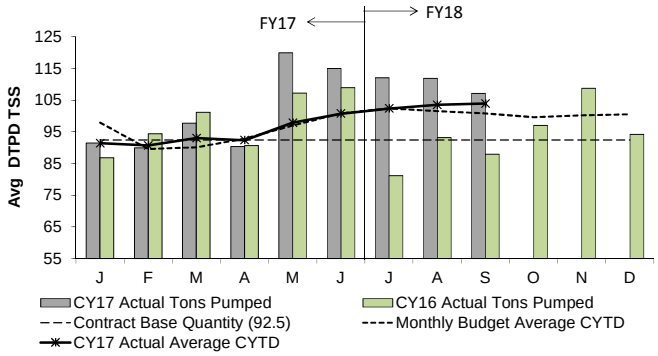
The Avg Daily DiGas Production in the 1st Quarter was 3.3% above target with the 3 Year Avg Daily DiGas Production. On average, 99.3% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant.

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

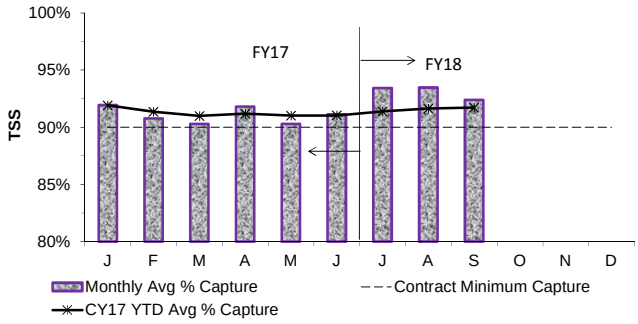
Residuals Pellet Plant

MWRA pays a fixed monthly amount for the calendar year to process up to 92.5 DTPD/TSS as an annual average. The monthly invoice is based on 92.5 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional payments are made on any quantity above the base amount. The base quantity of 90.0 DTPD/TSS was changed to 92.5 DTPD/TSS starting on January 1, 2016 with the terms of the new contract. On average, MWRA processes more than 92.5 DTPD/TSS each year (FY17's budget is 100.6 DTPD/TSS and FY18's budget is 99.5 DTPD/TSS).

Sludge Pumped From Deer Island



Monthly Average % Capture of Processed Sludge

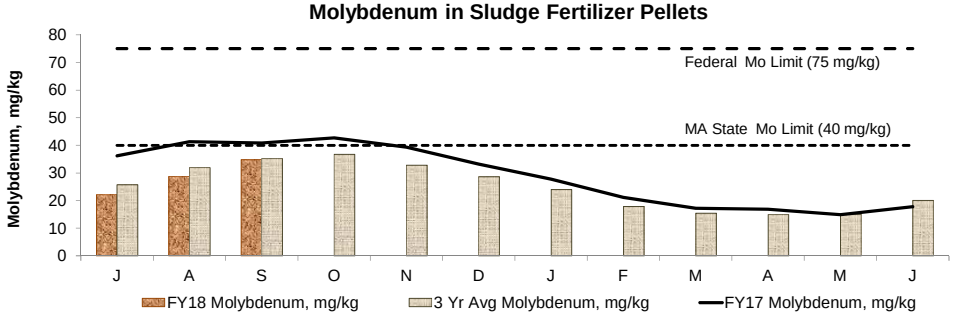


The average total quantity of sludge pumped to the Pellet Plant in the 1st Quarter of FY18 was 110.4 DTPD - above target with the FY18 budget of 100.8 DTPD. More sludge was sent to the Pellet Plant this quarter due to lower solids destruction during anaerobic sludge digestion as a result of digester maintenance activities.

The CY17 average quantity of sludge pumped is 104.0 DTPD - 3.1% above target, compared with the average budget of 100.8 DTPD for the same time period.

The contract requires NEFCo to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility in Quincy. The CY17 to date average capture is 91.73%.

Molybdenum in Sludge Fertilizer Pellets



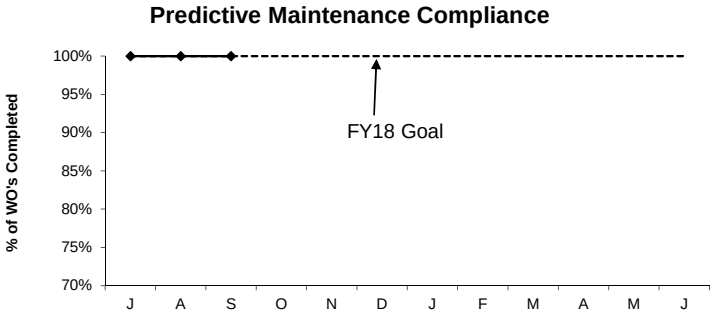
In September 2016, the Massachusetts Type I biosolids standard for molybdenum (Mo) was changed by the MaDEP to 40 mg/kg from the previous standard of 25 mg/kg. This change was approved following a complete technical review and assessment of risk by the Office of Research & Standards. The Federal standard for Mo is 75 mg/kg. Discharge of molybdenum-based cooling tower water is a significant source of Mo in the sludge fertilizer pellets. The Mo level in the Fore River sludge fertilizer pellets during the 1st Quarter of FY18 averaged 28.5 mg/kg, 8% lower than the 3 year average, 29% below the MA State Limit, and 62% below the Federal Limit.

Deer Island Maintenance

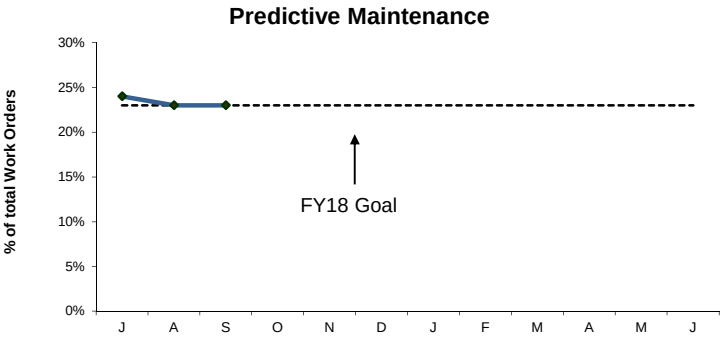
1st Quarter FY18

Productivity Initiatives

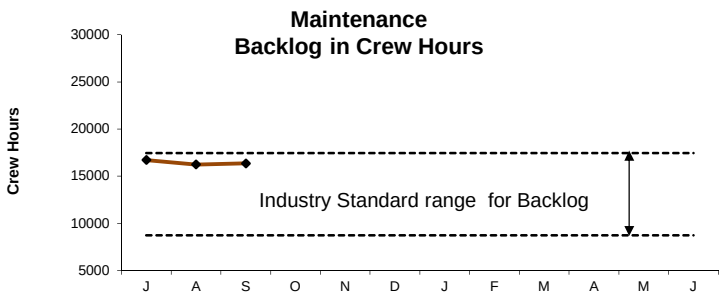
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.



Deer Island's FY18 predictive maintenance goal is 100%. DITP completed 100% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program.



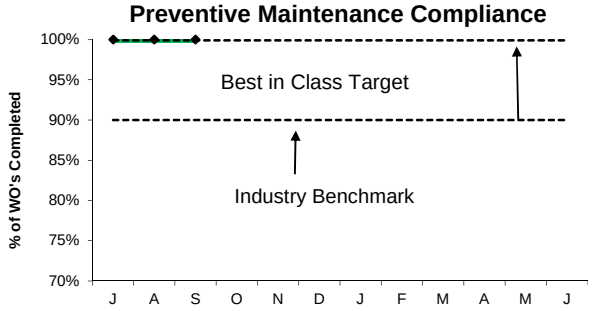
Deer Island's FY18 predictive maintenance goal is 23% of all work orders to be predictive. 23% of all work orders were predictive maintenance this quarter. The industry is moving toward increasing predictive maintenance work to reduce downtime and better predict when repairs are needed.



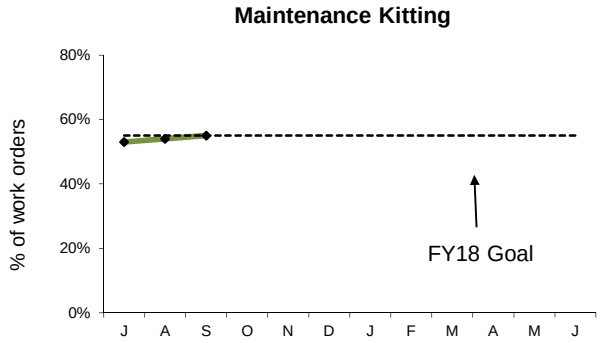
DITP's maintenance backlog at Deer Island is 16,436 hours this quarter. DITP is within the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by three vacancies; two M&O Specialists and a Pipe/Plumber. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

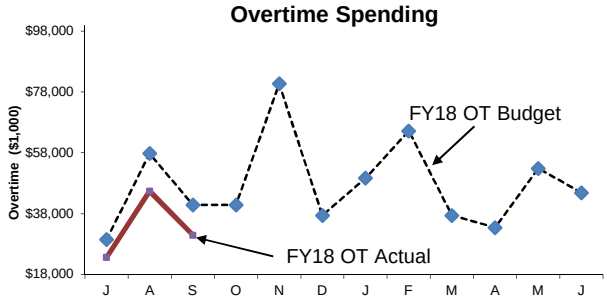
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.



Deer Island's FY18 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 100% of all PM work orders this quarter.



Deer Island's FY18 maintenance kitting goal is 55% of all work orders to be kitted. 54% of all work orders were kitted this quarter. Kitting is staging of parts or material necessary to complete maintenance work. This has resulted in more wrench time and increased productivity.



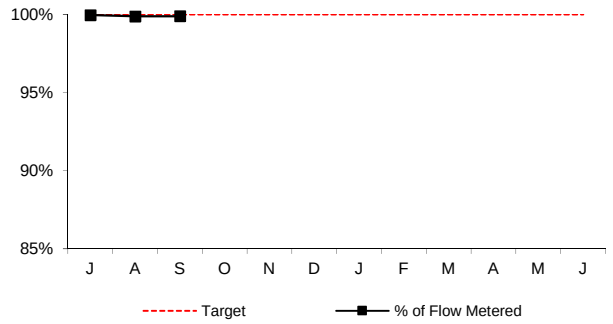
Maintenance overtime was under budget by $41K this quarter and $41k under for the year. Management continues to monitor backlog and to ensure all critical equipment and systems are available. This quarters overtime was predominately used for Storm Coverage/High Flows, Secondary Battery 'B' Valve Replacement Project, Clinton Electrical Upgrade Project and Eversource Cable Outage/Combustion Turbine Start Up Assistance.

Operations Division Metering & Reliability

1st Quarter - FY18

WATER METERS

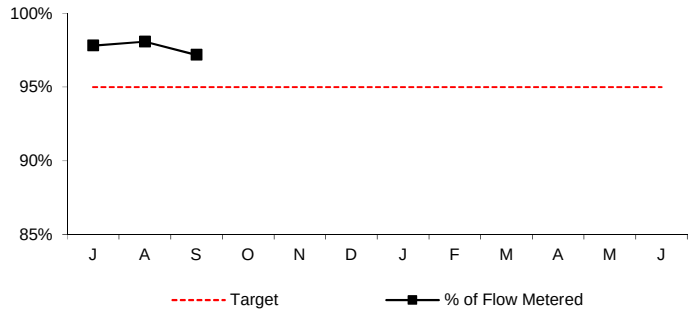
Percent of Total Revenue Water Deliveries Calculated Using Meters



The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During the 1st Quarter of FY18, meter actuals accounted for 99.91% of flow; only 0.09% of total revenue water deliveries were estimated. The following is the breakdown of reasons for estimations:
In-house and Capital Construction Projects - 0.01%
Instrumentation Failure - 0.08%

WASTEWATER METERS

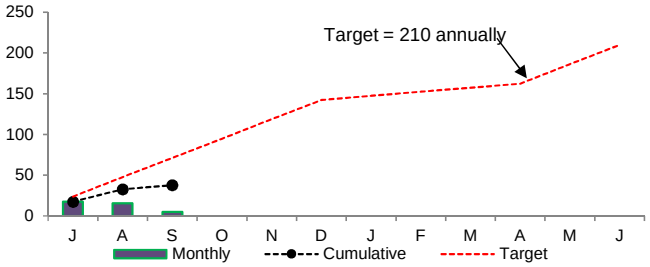
Percent of Total Wastewater Transport Calculated Using Meters



The target for revenue wastewater transport calculated using meters is 95%. Estimates are generated for meters missing data due to instrument failure and/or erratic meter behavior. Estimates are produced using data from previous time periods under similar flow conditions. During the 1st Quarter of FY18, meter actuals accounted for 97.69% of flow; only 2.31% of wastewater transport was estimated.

WATER DISTRIBUTION SYSTEM PIPELINES

Miles Surveyed for Leaks



During the 1st Quarter of FY18, 37.73 miles of water mains were inspected. Surveyed below target due to staff training and availability. Metering staff provided assistance to Malden, Quincy and Revere on higher than normal water usage.

Leak Backlog Summary

Month	J	A	S	O	N	D	J	F	M	A	M	J
Leaks Detected	4	2	4									
Leaks Repaired	2	1	3									
Backlog	8	9	10									

During the 1st Quarter of FY18, ten new leaks were detected and six were repaired. Refer to Leak Report below. Also, community service ranging from individual leak location to hydrant surveys were conducted for: Arlington, Chelsea, Malden, Medford, Newton, Somerville and Winchester.

FY18 Leak Report as of September 2017

Date Detected	Location of Leaks	Repaired
07/13/17	General Edwards Bridge, Medford	07/26/17
07/28/17	W. Roxbury Parkway, West Roxbury	07/28/17
08/28/17	#425 Riverside Ave., Medford. SEC-57	08/28/17
07/27/17	#1 Woodland Road @ Pond Street, Stoneham	09/01/17
09/15/17	Columbus St., @ Fenno Street, Chelsea	09/18/17
09/28/17	#436 Riverside Ave., Medford. Section-57	09/28/17

Date Detected	Location of Leaks/Unrepaired
06/08/15	Allandale Rd. @ Grove St., Brookline, Sect 78, located acoustically. Not surfacing.
06/17/15	Washington St at East St., Dedham; Sect 77, located acoustically, not surfacing, need redundant SEH pipeline to enable isolation.
07/01/16	241 Forest St. Winchester, Sect 89, leaking blow off valve, not surfacing. Need redundant NIH pipeline to enable isolation.
07/26/16	Reservoir Playground, Cleveland Circle, in softball outfield, Fisher Hill main leaking into drain, not surfacing, need to repair in Winter.
12/04/16	1025 W Roxbury Pkwy, Brookline, Sect 95, located acoustically, not surfacing, leaking blow off valve.
12/04/16	710 Ashland St/Summer St. Lynn, Sect 91, not surfacing. Leaking emergency connection valve between MWRA and LWSC systems. LWSC has difficulty isolating 16" main.
07/20/17	Mystic Valley Parkway, Medford. Not surfacing.
08/13/17	River Road @ Loring Rd, Weston. WASM-4; Not surfacing.
09/24/17	#215 Common Street, Watertown (will be repaired in October)
09/26/17	#1 Bellevue Street, Waltham (will be repaired in October)

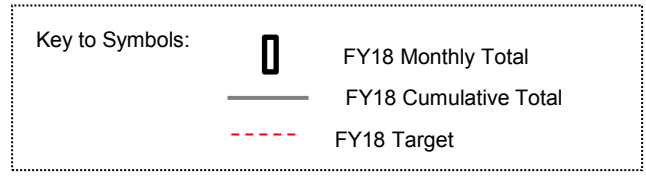
Water Distribution System Valves

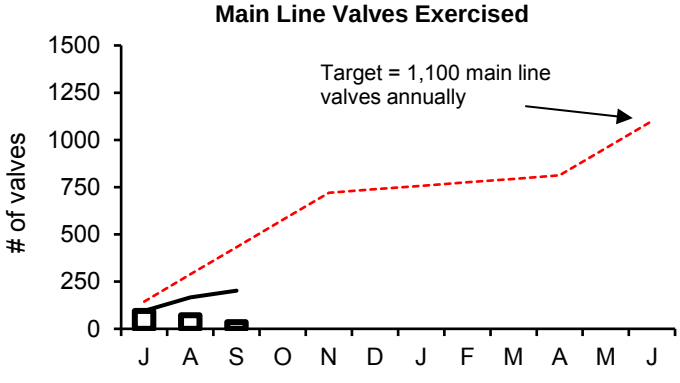
1st Quarter - FY18

Background

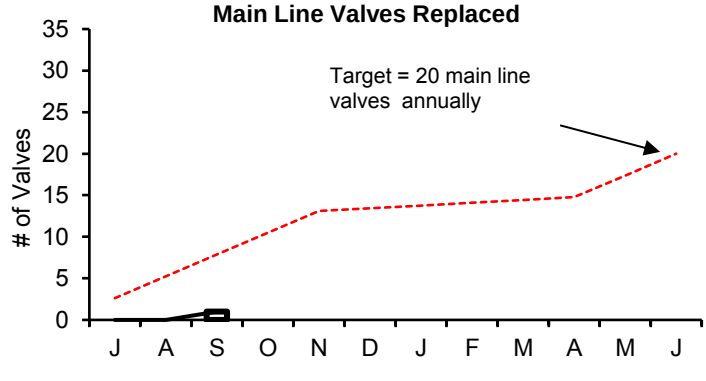
Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but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

Type of Valve	Inventory #	Operable Percentage	
		FY18 to Date	FY18 Targets
Main Line Valves	2,159	98.0%	95%
Blow-Off Valves	1,317	97.6%	95%
Air Release Valves	1,380	94.9%	95%
Control Valves	49	100.0%	95%

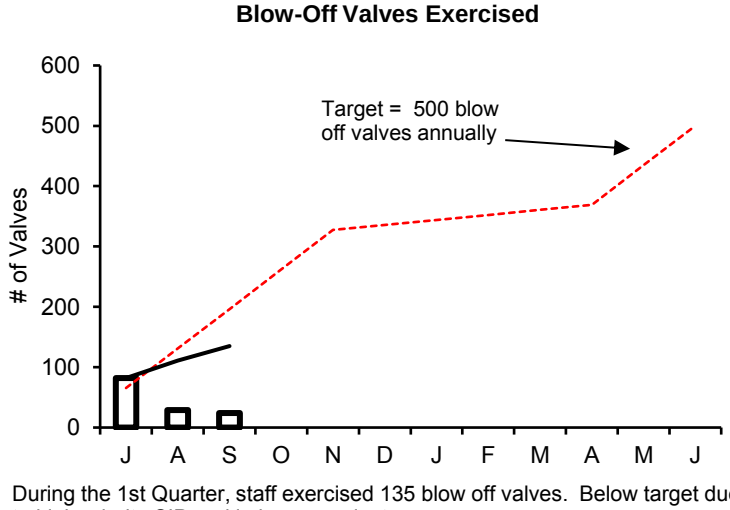




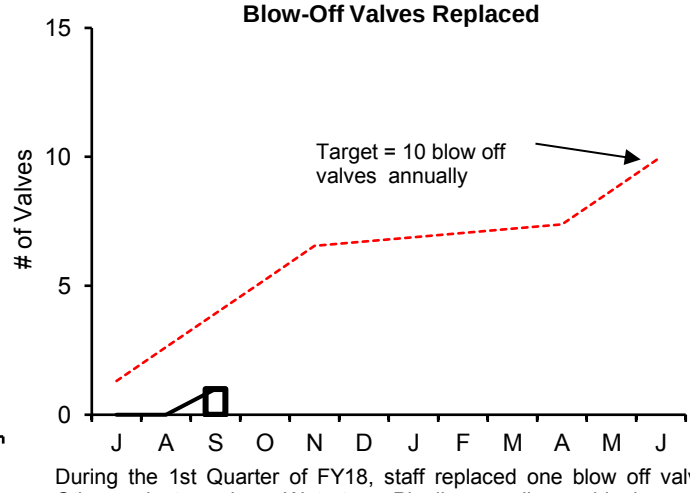
During the 1st Quarter of FY18, staff exercised 202 main line valves. Below target due to high priority CIP and in house projects.



During the 1st Quarter of FY18, staff replaced one main line valve. Other projects such as; Watertown Pipeline coupling and leak repairs are taking priority.



During the 1st Quarter, staff exercised 135 blow off valves. Below target due to high priority CIP and in house projects.

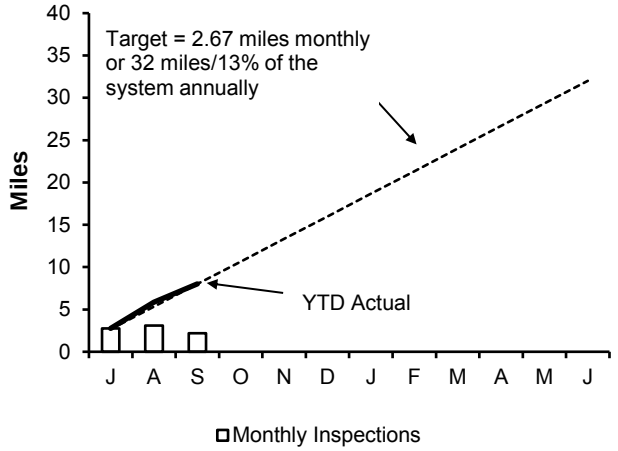


During the 1st Quarter of FY18, staff replaced one blow off valve. Other projects such as; Watertown Pipeline coupling and leak repairs are taking priority.

Wastewater Pipeline and Structure Inspections and Maintenance
1st Quarter - FY 18

Inspections

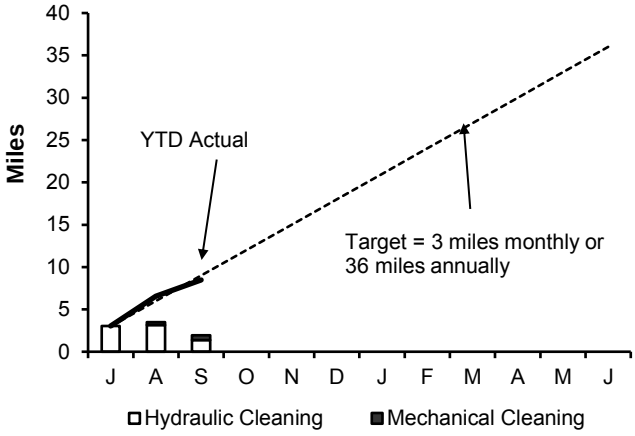
Pipeline Inspections



Staff internally inspected 8.02 miles of MWRA sewer pipeline during the first quarter. Community Assistance was provided to the city of Somerville and Cambridge this quarter. Staff inspected 100'of 24" sewer and 1,000' of 12" sewer respectively.

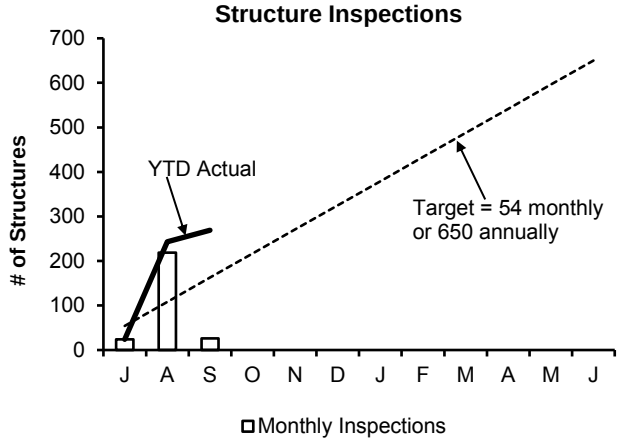
Maintenance

Pipeline Cleaning



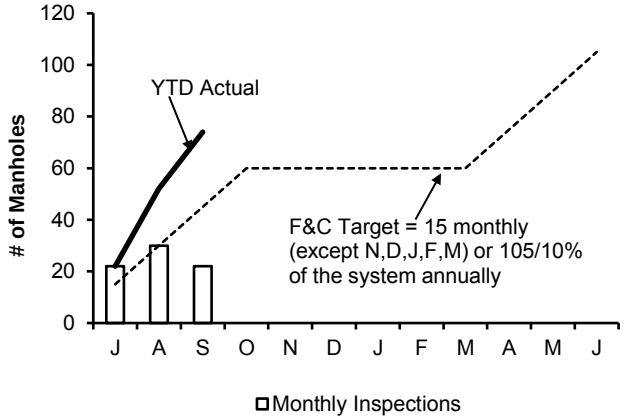
Staff cleaned 8.48 miles of MWRA's sewer system and removed 34 yards of grit and debris during this quarter. No Community Assistance was provided this quarter.

Structure Inspections



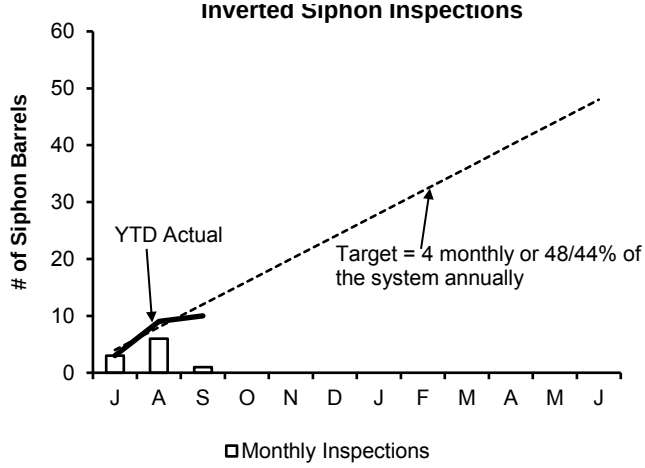
Staff inspected the 36 CSO structures and performed 233 additional manhole/structure inspections during this quarter.

Manhole Rehabilitation



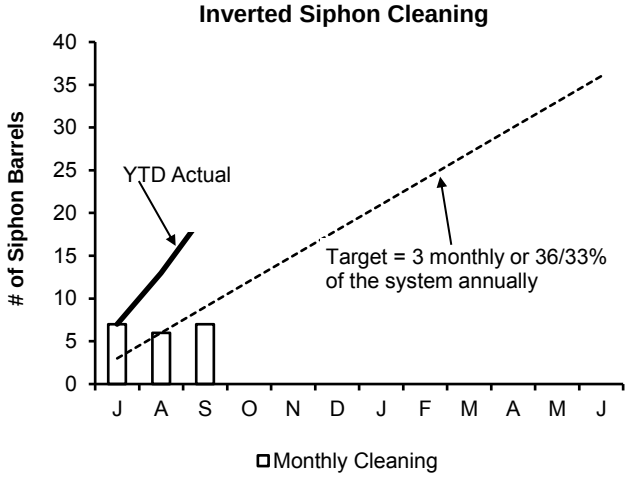
Staff replaced 74 frames & cover during this quarter.

Inverted Siphon Inspections



Staff inspected 10 siphon barrels this quarter.

Inverted Siphon Cleaning

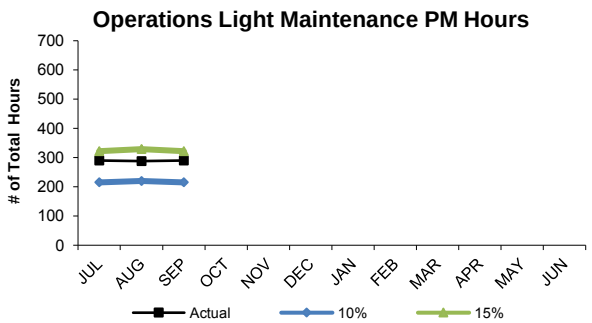


Staff cleaned 20 siphon barrels during this quarter.

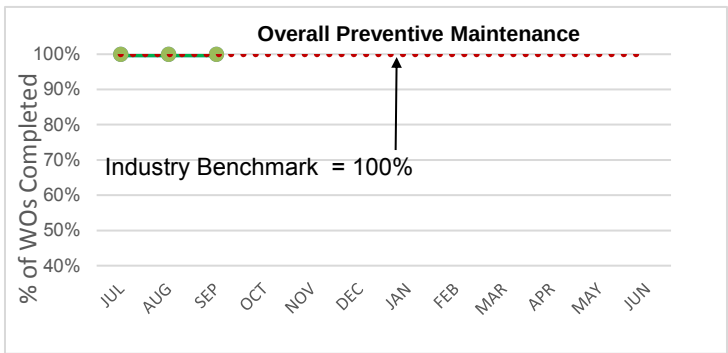
Field Operations' Metropolitan Equipment & Facility Maintenance

1st Quarter - FY18

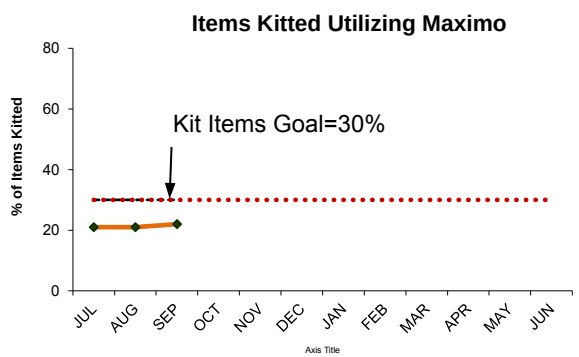
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



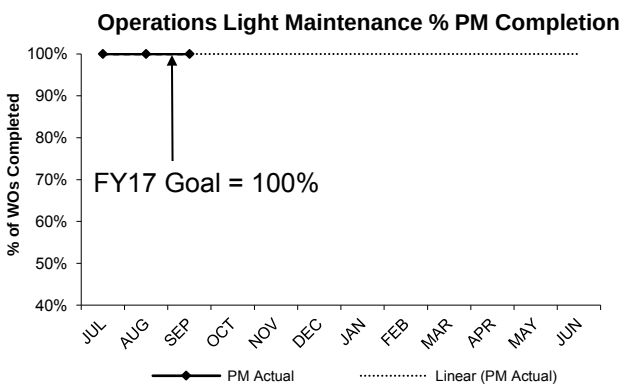
Operations staff averaged 289 hours of preventive maintenance during the 1st Quarter, an average of 14% of the total PM hours for the 1st Quarter, which is within the industry benchmark of 10% to 15%.



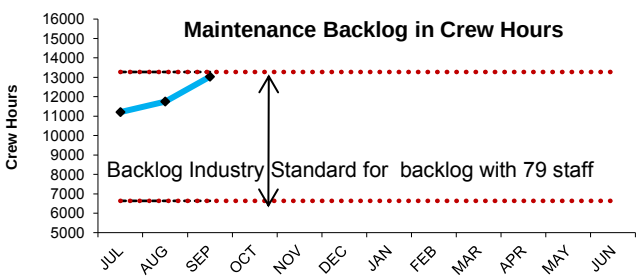
The Field Operations Department (FOD) preventive maintenance goal for FY18 is 100% of all PM work orders. Staff completed an average of 100% of all PM work orders in the 1st Quarter.



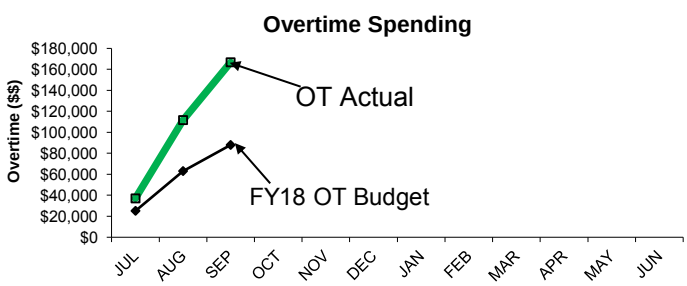
Operation's FY18 maintenance kitting goal has been set at 30% of all work orders to be kitted. Kitting is the staging of parts or material neccesary to complete maintenance work. In the 1st Quarter, 21% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY18 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 1st Quarter.



The 1st Quarter backlog average is 11998 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6450 to 12,940 hours.

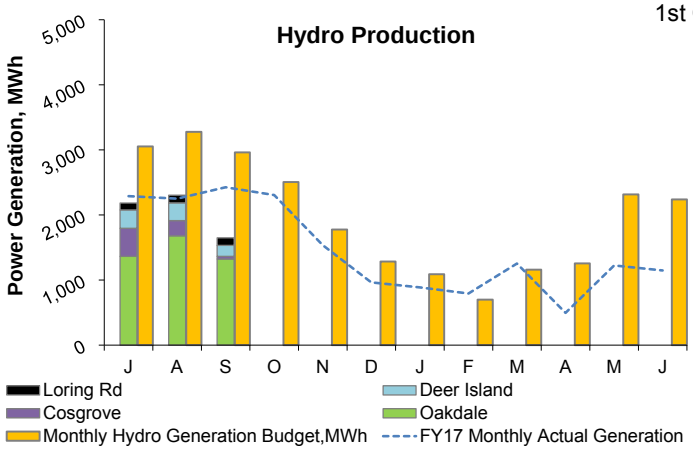


Maintenance overtime was $79k over budget for the 1st Quarter. Overtime was used for critical maintenance repairs.

Renewable Electricity Generation: Savings and Revenue

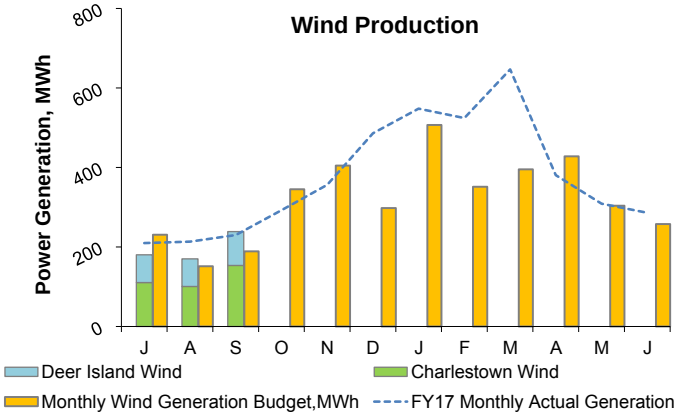
1st Quarter - FY18

Hydro Production



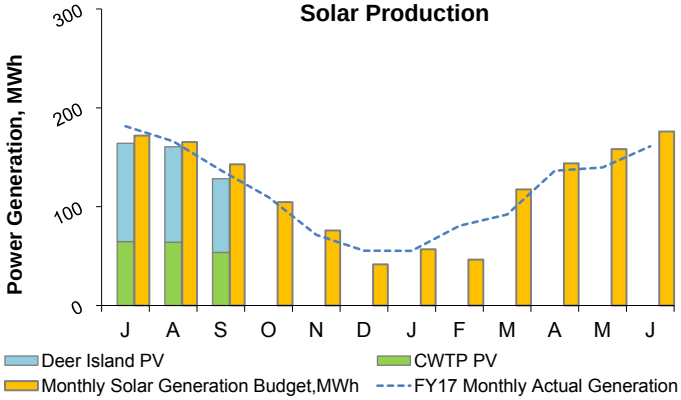
In the first Quarter, the renewable energy recorded as produced from all hydroelectric facilities totaled 6,134 MWh; 34% below budget[3]. This is mostly due to the Cosgrove generation values being highly underestimated by the utility company. The utility data is typically corrected and reconciled in later months of the year. The total savings and revenue[2] to date in FY18 (actuals through August[1]) is $143,546; 50% below budget[3], due to the underestimated Cosgrove generation values from the utility (stated above). The savings and revenue value does not include RPS REC revenue (see next page).

Wind Production



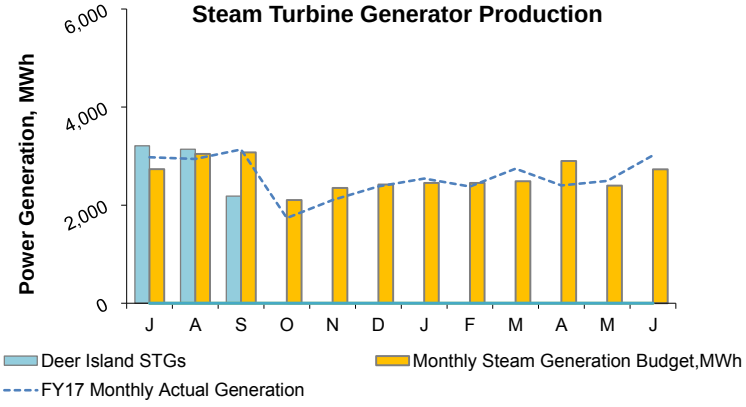
In the first Quarter, the renewable energy produced from all wind turbines totaled 589 MWh; 3% above budget[3].
The total savings and revenue[2] to date in FY18 (actuals through August[1]) is $57,471; 4% above budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

Solar Production



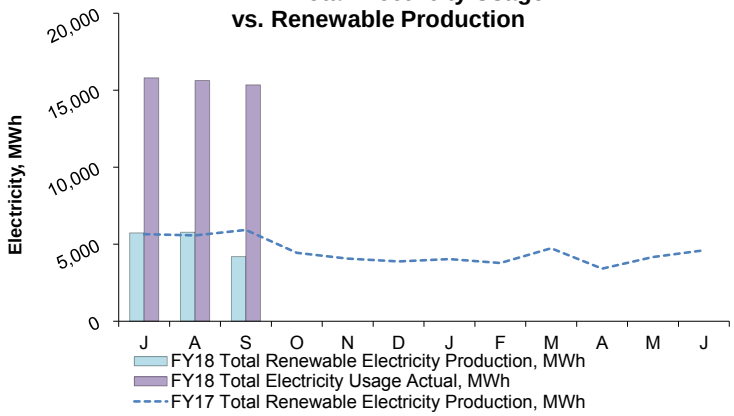
In the first Quarter, the renewable energy produced from all solar PV systems totaled 453 MWh; 6% below budget[3].
The total savings and revenue[2] to date in FY18 (actuals through August[1]) is $36,630; 8% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

Steam Turbine Generator Production

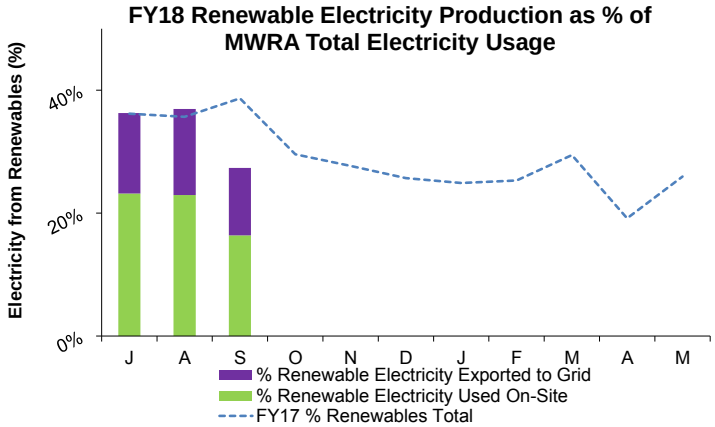


In the first Quarter, the renewable energy produced from all steam turbine generators totaled 8,534 MWh; 4% below budget[3].
The total savings and revenue[2] to date in FY18 (actuals through August[1]) is $499,928; 6% above budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

MWRA Total Electricity Usage vs. Renewable Production



FY18 Renewable Electricity Production as % of MWRA Total Electricity Usage

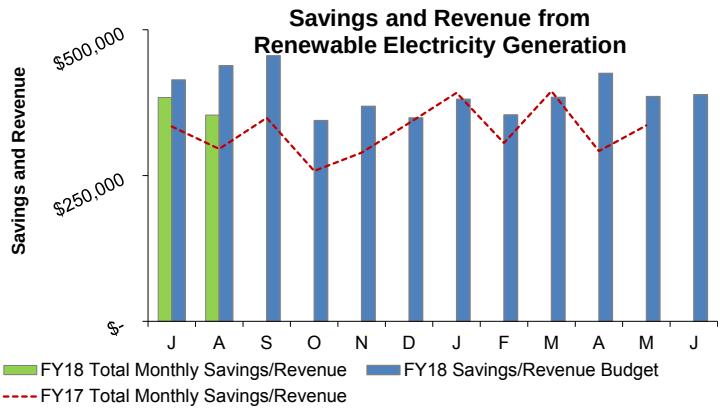


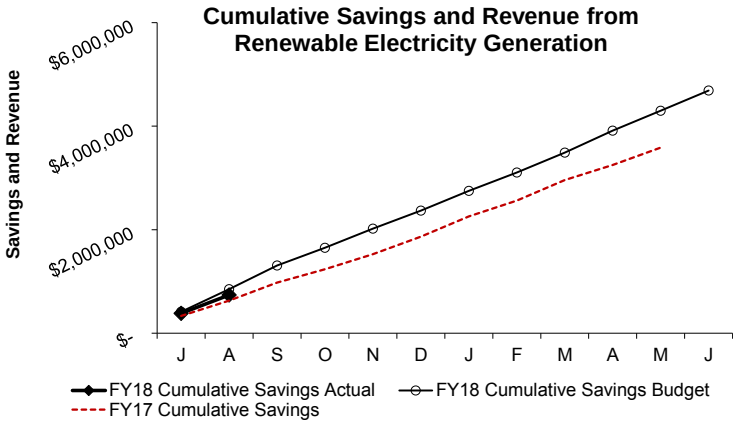
In the first Quarter of FY18, MWRA's electricity generation by renewable resources totaled 15,710 MWh. Cosgrove hydro generation data was underestimated by the utility and will be reconciled in later months; this will be reflected in future reporting. MWRA's total electricity usage was approximately 46,793 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site at these facilities. Approximately 99% of FOD electrical accounts are accounted for by actual billing statements; minor accounts that are not tracked on a monthly basis such as meters and cathodic protection systems are estimated based on this year's budget.
In the first Quarter of FY18, green power generation represented approximately 34% of total electricity usage. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.

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

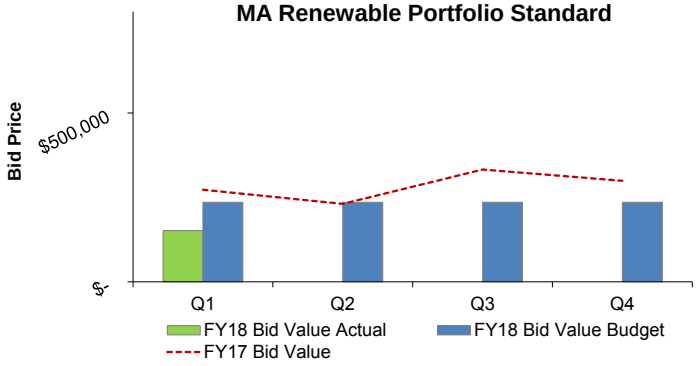
Renewable Electricity Generation: Savings and Revenue

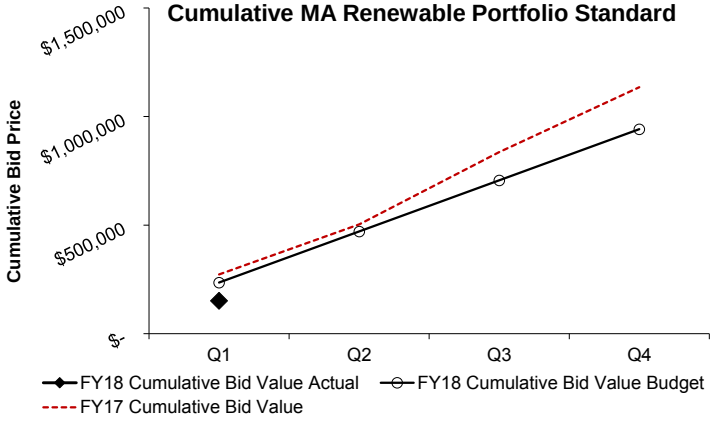
1st Quarter - FY18





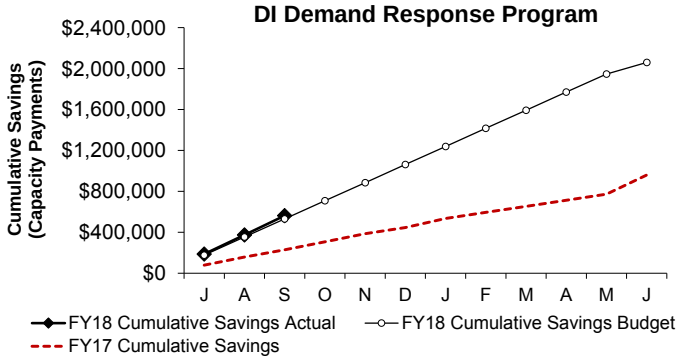
Savings and revenue from MWRA renewable electricity generation in the first 2 months of FY18 (actuals only through August[1]) is $737,575 ; which is 13% below the budget[3], partly due to the Cosgrove hydro generation values being underestimated by the utility (this will be reconciled in later months and will be reflected in future reporting).
Savings and revenue[2] from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).
The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).

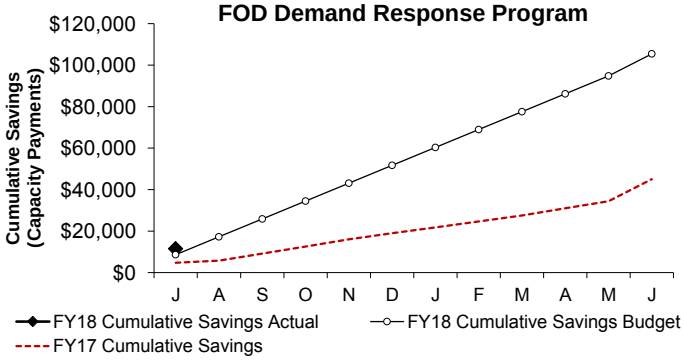




Bids were awarded during the 1st Quarter[1] from MWRA's Class 1 and Solar REC renewable energy assets; 8,449 Q1 CY2017 Class I Renewable Energy Certificates (RECs) and 55 Q1 CY2017 Solar RECs (SRECs) were sold for a total value of $151,291 RPS revenue; which is 36% below budget[3] for the Quarter. 782 Class II RECs were banked during Q1 for future sale.

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



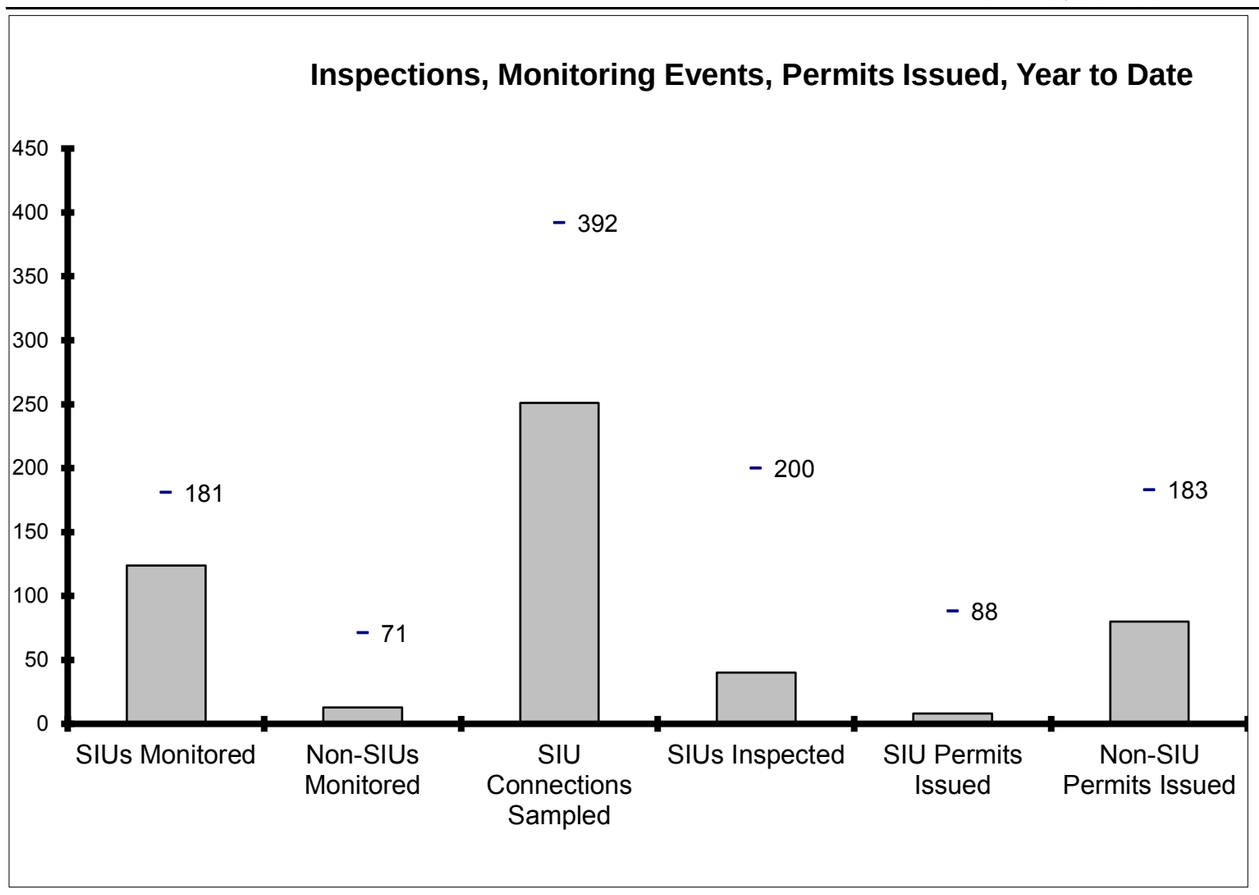


Currently Deer Island, JCWTP, and Loring Rd participate in the ISO-New England Demand Response Programs[4]. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE.
FY18 Cumulative savings (Capacity Payments only) through September[1] total $562,763 for DI and $11,501 for FOD through July[1].

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

Toxic Reduction and Control

1st Quarter - FY18



EPA Required SIU Monitoring Events
for FY18: 181
YTD : **124**

Required Non-SIU Monitoring Events
for FY18: 71
YTD : **13**

SIU Connections to be Sampled
For FY18: 392
YTD: **251**

EPA Required SIU Inspections
for FY18: 200
YTD: **40**

SIU Permits due to Expire
In FY18: 88
YTD: **8**

Non-SIU Permits due to Expire
for FY18: 183
YTD: **80**

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

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

TRAC's annual monitoring and inspection goals are set at the beginning of each fiscal year but they can fluctuate due to the actual number of SIUs at any given time. During the course of the year, some SIUs do not discharge and cannot be monitored
TRAC also monitors one-third of the non-SIUs each year.

SIU and Non-SIU permits are issued with durations of two to five years, depending on the category of industry, varying the number of permits that expire in a given year.

Number of Days to Issue a Permit

	0 to 120		121 to 180		181 or more		Total Permits Issued	
	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU
Jul	5	15	0	1	0	2	5	18
Aug	1	46	0	5	0	0	1	51
Sep	2	8	0	3	0	0	2	11
Oct							0	0
Nov							0	0
Dec							0	0
Jan							0	0
Feb							0	0
Mar							0	0
Apr							0	0
May							0	0
Jun							0	0
% YTD	100%	86%	0%	11%	0%	3%	8	80

In the 1st Quarter of FY18, eighty-eight permits were issued, eight of which were SIUs. The SIU permits were all issued within 120 days- satisfying the EPA requirement. There were eleven non-SIU permits issued beyond the 120-day timeframe with two of them beyond the 180-day timeframe. Delays ranged from i) waiting for sampling data to determine the permit category, ii) waiting for payment of the permit fees, iii) waiting for approval from the municipality in which the industry was operating or intended to operate, and iv) waiting for construction to be completed, including installation of required equiment to facilitate discharge to the sewer.

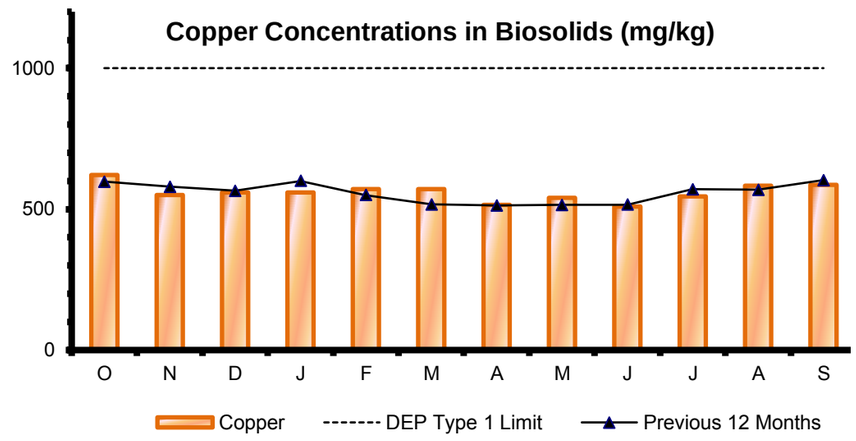
The new Clinton NPDES permit effective March 1, 2017, requires TRAC to issue/renew all industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be an SIU.

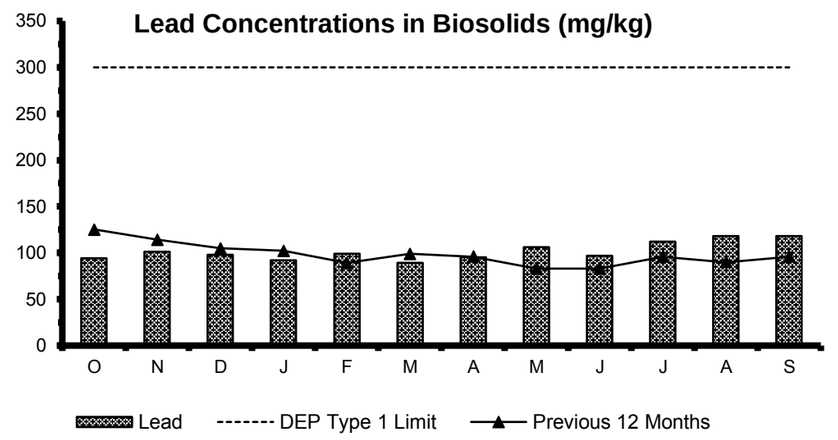
There were no Clinton SIU permits issued during the period.

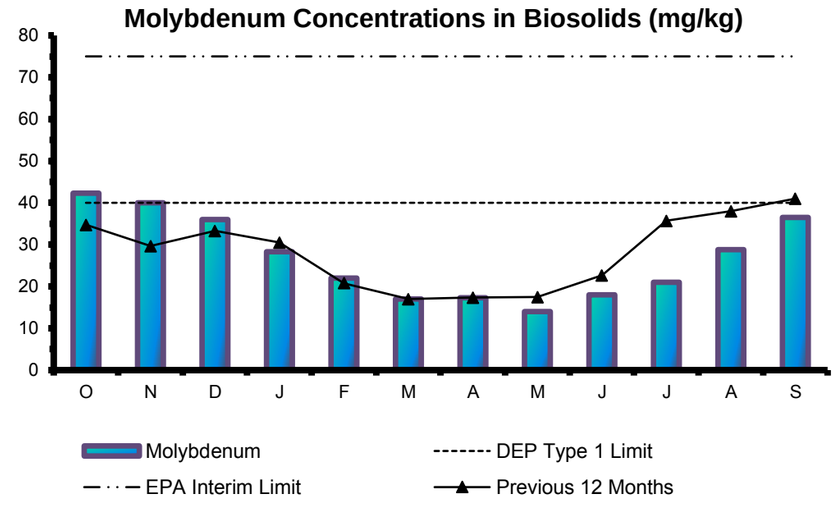
Copper, lead, and molybdenum are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. While the levels are below the DEP Type 1 limit for all three metals, there has been an increase in the lead levels compared with the same period a year ago.

With the September 2016 change in theMassDEP regulations, increasing the molybdenum limits to 40 mg/kg for land use application, the MWRA may more often be able to sell its pellets in-state whereas the previous limits forced several months’ worth of pellets to be shipped out of state. This made it an impractical source of fertilizer for local Massachusetts farms.

In the first three months of this fiscal year, the levels of molybdenum have been below the current DEP limits and even more importantly, below the levels during the same period a year ago. MWRA and its contractor, NEFCO, do not distribute product that does not meet the suitability standards.







Field Operations Highlights
1st Quarter – FY18

Western Water Operations and Maintenance

- Carroll Water Treatment Plant staff participated in the annual demand response drill that requires that the facility be on backup power within 30 minutes of notification. Diving contractor completed the underwater 5-year inspection of the Cosgrove Intake upper and lower intake sluice gates. Staff supported the Traveling Screen Replacement Project at the Winsor Dam Intake. This project replaced both of the traveling screens while keeping the facility.

- Flow tests were performed to determine max flow in the Chicopee Valley Aqueduct based on settings of the Back Pressure Sustaining Valves at Route 21 in Ludlow. These measurements will be utilized to evaluate future flow conditions in the system. Turbine startup and testing was conducted on the Hatchery Supply Line Hydro Turbine in coordination with the hatchery as well as National Grid. These test are necessary for National Grid to accept the power that is generated.

Metro Water Operations and Maintenance

- The Chestnut Hill Emergency Pump Station was run during the early morning hours on September 27th. Three of the four pumps operated well. Pump #2 experienced issues with its Surge Control Valve. The issues are being checked and the pump will be run next quarter.

- WASM 4 Leak on River Road in Weston: While performing routine maintenance on the triple meter vault on River Road, Metering staff heard running water through the concrete chamber wall. This chamber houses three large venturi meters, on WASMs 1, 2 and 4. Leak Detection staff acoustically determined the presence of a leak on the WASM 4 Pipeline. WASM 4 provides service via the Northern High Hydraulic Grade Line to Meter 103 in Watertown, 104 and 105 to Newton, and is the source of water to the Nonantum Road Pressure Reducing Facility in Brighton, the normal source of supply to the Spot Pond Storage Tanks. In order to isolate WASM 4 for the leak repair, several systems changes were necessary, including activating two local PRVs in the Newton water distribution system, and isolating

- Meters 104 and 105. Several attempts were made to activate the Newton PRVs, but they were in need of updated control piping and pilot valves. (The Newton PRVs were repaired and leak repair was completed in early October.)

Operations Engineering

EAP for City, City Extension and the Dorchester Tunnels: Operations Engineering and Planning are currently developing operation plans for the reconfiguration of the system during a tunnel isolation. Training for MWRA staff is scheduled for November.

Water Quality Meetings: Individual meetings are held each month between MWRA Operations Engineering, Planning and Water Quality Assurance and water communities to discuss current DEP Policies, water quality, hydraulics, lead and MWRA Loan Programs. This quarter, staff met: Medford, Somerville, Wakefield, Wilmington, Needham, Wellesley and Weston.

Wastewater Operations & Maintenance

- Nut Island Standard Operating Procedures (SOPs): Operations Staff wrote updated SOPs for putting screening channels and grit vortexes online and offline in remote control (via SCADA) and manual control (local controls). All Operations Staff are being trained on the updated SOPs.

- Back-Up Pump Control: Operations Staff worked with Process Control and SCADA Staff to review and revise Power Loss/Backup Power Pump Control Test Procedures to test backup pump control and ensure proper emergency operation for all wastewater pumping stations. Backup pump control has been tested at Prison Point CSO (dry weather flows only), and the Hayes, DeLauri, Braintree-Weymouth, Hingham, IPS, Hough's Neck, Quincy and Squantum Pump Stations.

Field Operations Highlights
1st Quarter – FY18

- Union Park Facility Generator Fuel Tank: On June 28th, there was an alarm that there was fuel oil in the interstitial space between the primary and secondary containment of the generator fuel oil tank. Staff worked with Woodard & Curran staff to have a temporary tank delivered to the facility, the oil transferred, and the generator tested. Staff are working on a permanent resolution, and have kept Boston Water & Sewer Commission and Woodard & Curran updated on the status.

- Chelsea Creek Headworks Hydrogen Cyanide Incident: On August 8th, the Chelsea and Boston Fire Departments responded to a report of detection of hydrogen cyanide at the Chelsea Creek Headworks. After a thorough investigation, staff are confident that the detection of hydrogen cyanide was, in fact, detection of hydrogen sulfide, a biologically produced byproduct routinely found in wastewater. The incident was covered by major news outlets in the Boston area.

- Tour of South Boston Pump Station for BWSC: Operations Staff conducted a tour for BWSC and Woodard & Curran staff, focused on MWRA's recently installed flood protection. Flood protection will be installed at the Union Park CSO Facility which is operated by Woodard & Curran and jointly managed by the MWRA and BWSC.

TRAC

- On July 20th, TRAC Staff responded to an incident at Ward Street Headworks which received a 30-minute influx of food packages that temporarily blinded the Bar Screens. Staff investigated the tributary interceptors but did not find any residual packages in the lines. The packages were a very specific mix of food products that could be found in secured packaging supplied to prisons. Local facilities were identified and their tributary discharge examined but revealed no connection to Ward Street. Investigations are ongoing.

Environmental Quality-Water

- Throughout the quarter, staff provided onsite sampling and sonde profiling support at the Chestnut Hill Standby Reservoir. In July, efforts focused on monitoring the reservoir during a cyanobacteria bloom. In August, an onsite reservoir assessment and sonde profiling showed improvement in water quality conditions since the cyanobacteria bloom earlier in the summer. In September, sampling was conducted in response to dying yellow perch. Testing results throughout the quarter showed neither detection of algal toxins nor detection of taste and odor compounds.

- In coordination with DEP CERO, staff conducted water quality profiling and sampling at several locations on Sudbury Reservoir on September 26th. Several samples were screened using the Fluid Imaging FlowCam to determine if there was presence of cyanobacteria.

- ENQUAL staff, in coordination with the Reservoir Operations Section and its Contractor, sampled all standby emergency reservoirs in July.

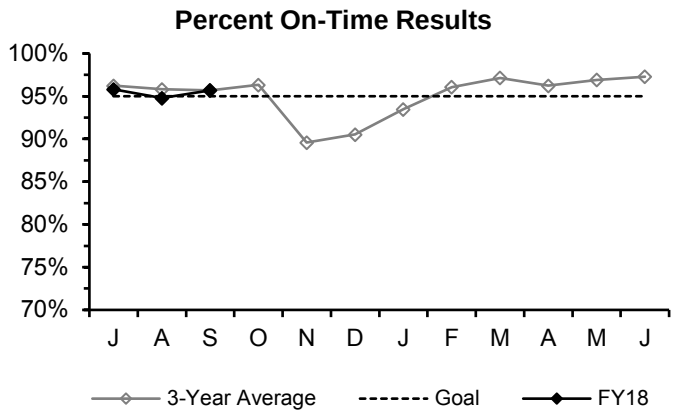
- Staff collected quarterly samples for the Optimum Water Quality Parameters (OWQP) Program on September 6th and 7th, measuring pH and alkalinity at 27 sites across the MWRA service area. All samples met DEP required limits. Staff collected additional samples this quarter for a review of MWRA Corrosion Control Optimization Program.

Environmental Quality-Wastewater

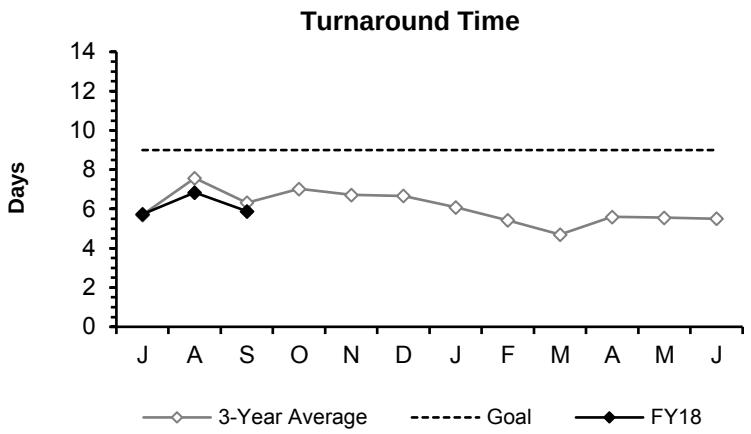
- Harbor/Beach/CSO Monitoring: Submitted 2016 CSO Receiving Water Monitoring Report as required by the variances for the Charles River and Alewife Brook/Upper Mystic River. DCR beach daily results were posted to MWRA.com through Labor Day. Harbor and river monitoring continued including post-storm monitoring of selected weekends.

Laboratory Services

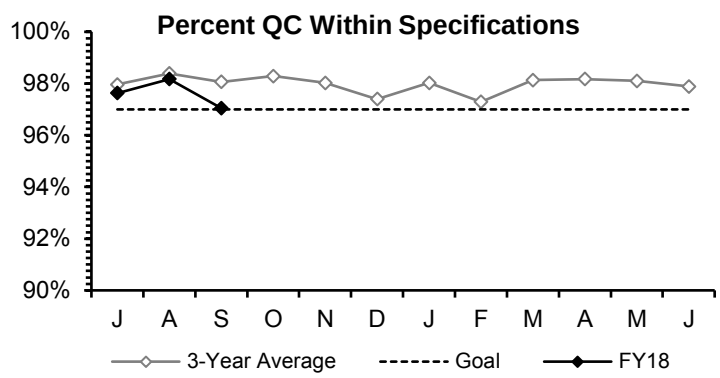
1st Quarter - FY18



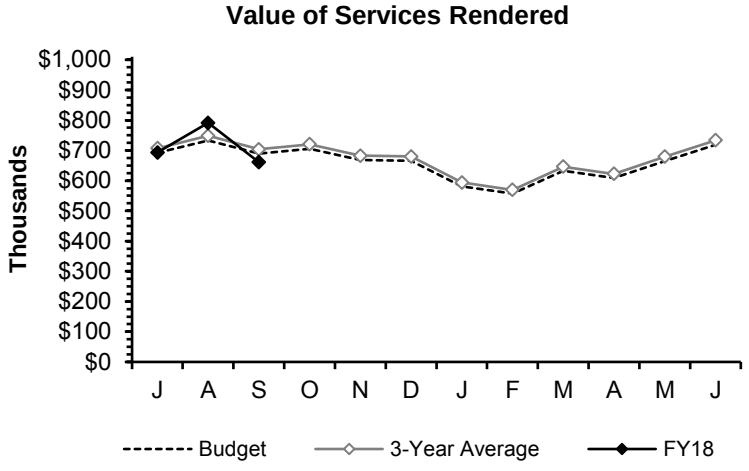
The Percent On-Time measurement was above the 95% goal two months of the quarter. All regulatory reporting deadlines were met.



Turnaround Time was faster than the 9-day goal three months of the quarter.



Percent of QC tests meeting specifications was above the 97% in-house goal three months of the quarter.



Value of Services Rendered was slightly below the seasonally adjusted budget projection two months of the quarter.

Highlights:

Quality Assurance:
On this year's Proficiency Testing samples, required for DEP Certification and the EPA DMR-QA program, we achieved acceptable results on all parameters tested. The quarterly rolling audit was on Data Tracability and found good compliance with procedures. Also, semi-annual supervisor audits on methods and procedures found good compliance and no significant issues. **DITP.** Lab staff briefed DMF and FDA representatives on Mass Bay bacteria sampling and lab testing as part of a DITP tour.

Drinking Water.
In a reponse to the Environmental Laboratory Advisory Board, EPA agreed that cyanide testing in drinking water can be problematic and the required test methods need to be improved to avoid false positives.

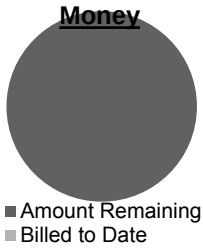
Wastewater Transport.
The Central Lab performed rush testing in support of the Chelsea Creek Headworks "Hydrogen Cyanide" incident.

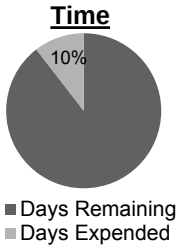
CSO Assessment:
We continued to perform weekend CSO receiving water sampling in the Charles and Mystic Rivers during/after significant wet weather events. This is intended to give additional data for the CSO Assessment to document the recovery of the rivers after it rains. Also, we will begin testing CSO facility influent for bacteria during activations at Cottage Farm and Prison Point as surrogates for untreated CSO discharge.

CONSTRUCTION PROGRAMS

Projects In Construction

1st Quarter– FY18



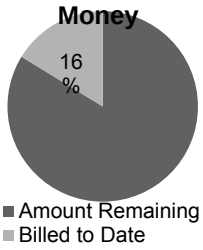


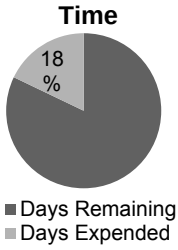
Reading Extension Sewer Rehabilitation

Project Summary: This project involves the rehabilitation of 10,820-linear feet of the Reading Extension Sewer and 2,280-linear feet of the Metropolitan Sewer and 62 associated manholes/structures.

Notice to Proceed: 10-Aug-2017 *Contract Completion:* 10-Dec-2018

Status and Issues: The NTP was issued in August and to date no physical work has taken place. The Contractor has been providing submittals which are being reviewed.



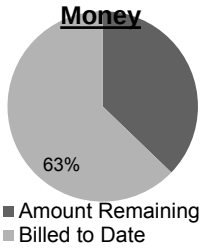


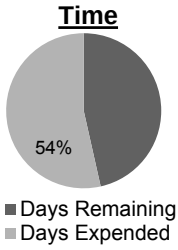
Chelsea Creek Headworks Upgrade

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

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

Status and Issues: As of September, the electrical contractor continued the layout of upcoming work to relocate one of the scrubber VFD's. The painting contractor patched and painted above Channel #4 east end of the bar screen and on the mezzanine.



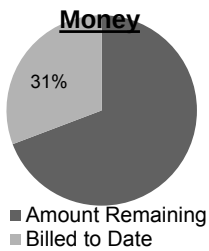


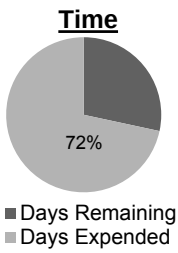
Wachusett Aqueduct Pumping Station

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

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

Status and Issues: As of September, the Contractor installed the metal deck and roof truss system. They secured the 36" pipe train and pedestals associated with Pump's #1 through #7, adjusted the 84" steel piping and installed the bypass at the 84" BFV.





Alewife Brook Pump Station Improvements

Project Summary: This project involves the replacement of wet-weather pumps, motors, gear drives, VFD's, MCC, screens, sluice gates, standby generator, roof, PLC's and HVAC. Also, the remediation of PCB's and asbestos and the installation of a flow meter on the 66-inch downstream Alewife Brook Conduit.

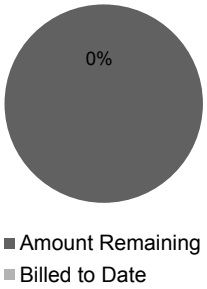
Notice to Proceed: 29-Jan-2016 *Contract Completion: 3*1-May-2018

Status and Issues: As of September the Contractor began fusing the HDPE piping and installed knife gates for the bypass pumping system. The also set the boiler and associated expansion tanks.

Projects In Construction

1st Quarter– FY18

Money



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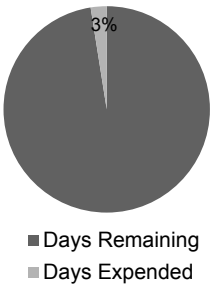


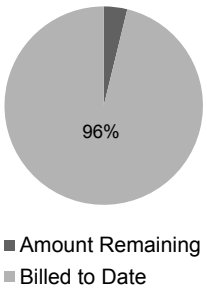
NIH Section 110 - Stoneham

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

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

Status and Issues: The NTP for this project was issued September 5th. Work to date has consisted of the review of submittals.

Money



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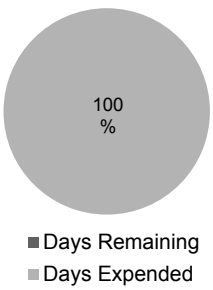


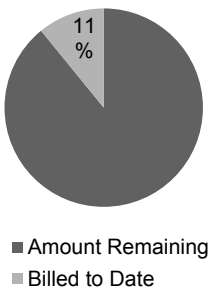
DITP Valves and Piping Replacements

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

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

Status and Issues: As of September, the Contractor removed the temporary dewatering system, including the temporary cap with pump suction piping on the North System Tunnel. The Contractor commenced demobilization and began addressing punchlist items.

Money



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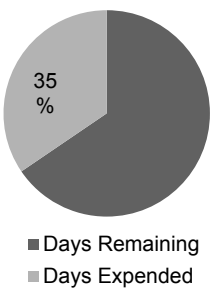


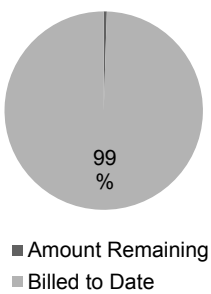
Winthrop Terminal VFD and Motor

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

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

Status and Issues: The Contractor, JFW submitted major equipment submittals. The second transformer was tested in September, with the first VFD/motor to be shop tested in November.

Money



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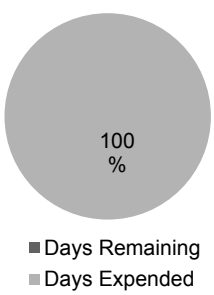


DITP Replacement of Scum Skimmers

Project Summary: This project involves the replacement of the existing carbon steel tip tubes with 316 stainless steel in 48 primary and 54 secondary clarifiers to improve reliability and increase longevity.

Notice to Proceed: 9-Oct-2013 *Contract Completion:* 10-Oct-2016

Status and Issues: This project is complete.

CSO CONTROL PROGRAM
1st Quarter – FY18

All 35 projects in the Long-Term CSO Control Plan are complete, in compliance with Schedule Seven. Of the $910.6 million FY18 CIP budget for the CSO Control Program, approximately $8.4 million remains to be spent through 2021. Remaining work includes Cambridge's completion of surface restoration associated with the Alewife/CAM004 sewer separation contracts ($1.3 million), BWSC's removal of additional inflow from its Dorchester Interceptor system in the South Dorchester Bay sewer separation areas ($3.8 million), the federal court mandated three-year CSO post-construction monitoring and performance assessment, 2018-2020 ($3.0 million) and as-needed technical or regulatory support ($0.3 million).

Project/Item	Status as of September 30, 2017
BWSC Memorandum of Understanding and Financial Assistance Agreement (MOU/FAA)	MWRA staff have completed final eligibility reviews – and MWRA and BWSC have executed final eligibility certifications – for the BWSC construction and ESDC contracts funded through the MOU/FAA since inception in 1996. The MOU/FAA ended on June 30, 2017. Remaining BWSC CSO related work eligible for MWRA funding is limited to the removal of additional stormwater inflow from the BWSC Dorchester Interceptor system. This work has been removed from the MOU/FAA and instead will be funded under a new, separate agreement (see related item, below).
Dorchester Interceptor Inflow Removal	MWRA's CIP and the MOU/FAA with BWSC included $5.4 million for additional inflow removal from the BWSC Dorchester Interceptor system in the South Dorchester Bay Sewer Separation area, of which $1.7 million was transferred to the BWSC MOU/FAA CSO account and $1.6 million of that was withdrawn by BWSC to fund related design and construction work. On May 17, 2017, the MWRA Board of Directors authorized removing the remaining $3.8 million from the BWSC MOU/FAA and instead including this funding amount in a separate, 4-year financial assistance agreement with BWSC effective July 1, 2017.
City of Cambridge Memorandum of Understanding and Financial Assistance Agreement	The City of Cambridge attained substantial completion of its last project, CAM004 Sewer Separation, in December 2015 in compliance with Schedule Seven. Extensive surface restoration work eligible for MWRA funding at a remaining award amount of $1.3 million is scheduled to continue through December 2017, followed by six months of final eligibility review, close-out of the Cambridge construction contracts and close-out of the MOU/FAA in June 2018. Staff plan to transfer the funds in the remaining award amount to the City of Cambridge this fall to cover eligible expenses through the remaining term of the MOU/FAA.
MWRA CSO Performance Assessment	The federal court schedule requires MWRA to commence a 3-year assessment of CSO performance by January 2018. MWRA submitted the Scope of Work for the CSO Post-Construction Monitoring Program and Performance Assessment to EPA and DEP on May 1, 2017, and has incorporated EPA and DEP comments into the Scope. On July 1, MWRA advertised the RFQ/P for a professional services contract, Contract 7572, that includes flow metering, hydraulic modeling, water quality evaluations and system performance assessments. Four responsive proposals were received on August 25, 2017, and staff plan to seek Board authorization on October 18, 2017, to award Contract 7572 to the first ranked firm.

CIP Expenditures

1st Quarter – FY18

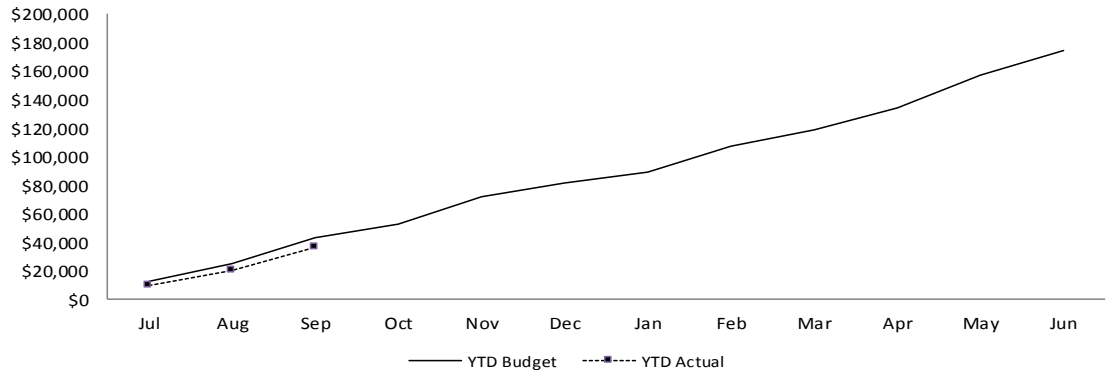
FY18 Capital Improvement Program Expenditure Variances through September by Program ($ in thousands)				
Program	FY18 Budget Through September	FY18 Actual Through September	Variance Amount	Variance Percent
Wastewater	19,573	18,431	(1,142)	-6%
Waterworks	22,214	17,897	(4,317)	-19%
Business and Operations Support	1,404	610	(793)	-57%
Total	$43,191	$36,939	($6,252)	-14%

Project underspending within Wastewater was due to Cambridge Sewer Separation delay in payment for final restoration work, construction delays for the Clinton Phosphorus Reduction contract, as well as work anticipated for FY18 that was completed in FY17 for the North Main Pump Station and Winthrop Terminal Facility Butterfly Valve Replacements, Digester Sludge Pump Replacement Construction Phase 2, and Deer Island Fuel Oil System Upgrades contracts. This was partially offset by greater than anticipated community requests for grants, progress for the Chelsea Creek Upgrades Construction and Study of Sections 186, 4, 5, and 6 contracts. Project underspending in Waterworks was due to less than anticipated requests for community loans, construction issues related to surge tank installation and pipe testing for the Wachusett Aqueduct Pumping Station Construction, work anticipated in FY18 completed in FY17 for the Northern Intermediate High Section 89/29 Redundancy Phase 1B, delay in Notice to Proceed for Southern Extra High Section 111 Construction 2, partially offset by construction progress for the Northern Intermediate High Phase 1C and Southern Extra High Section 111 Construction 1 contracts, and timing of watershed land purchases.

Budget vs. Actual CIP Expenditures

($ in thousands)

Total FY18 CIP Budget of $174,539



Construction Fund Management

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

Cash Balance as of 9/23/2017	$79.3 million
Unused capacity under the debt cap:	$1.397 billion
Estimated date for exhausting construction fund without new borrowing:	MAY-18
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding: Commercial paper capacity / Revolving Loan	$178 million $ 350 million
Budgeted FY18 capital spending*:	$160 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

1st Quarter – FY18

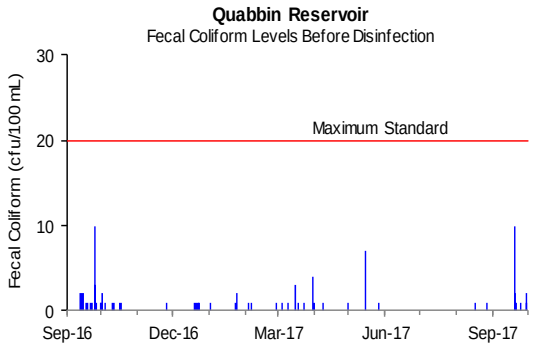
Source Water – Microbial Results

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

Sample Site: Quabbin Reservoir

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

All samples collected during the 1st Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples have exceeded a count of 20 cfu/100mL, compared to the allowable 10%.**

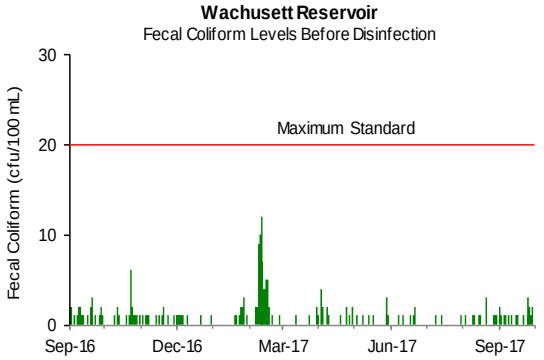


Sample Site: Wachusett Reservoir

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

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

All samples collected during the 1st Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

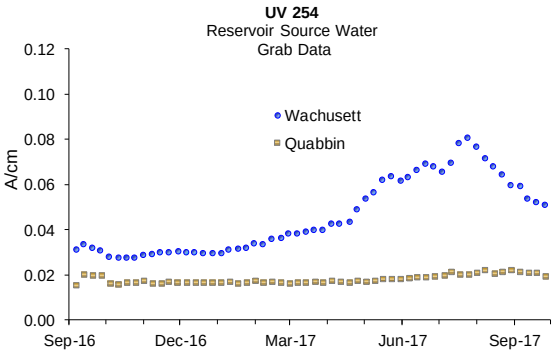


Source Water – UV Absorbance

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

Quabbin Reservoir UV-254 levels are currently around 0.019 A/cm.

Wachusett Reservoir UV-254 levels are currently around 0.051 A/cm.



Source Water – Turbidity

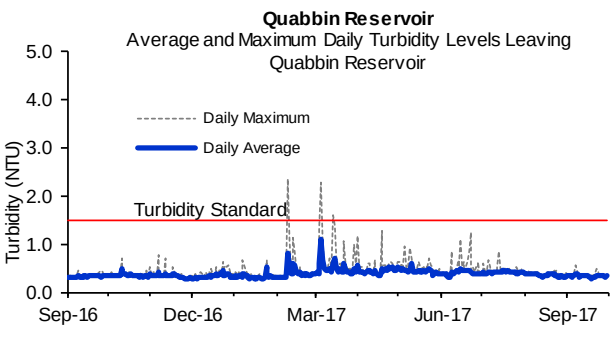
1st Quarter – FY18

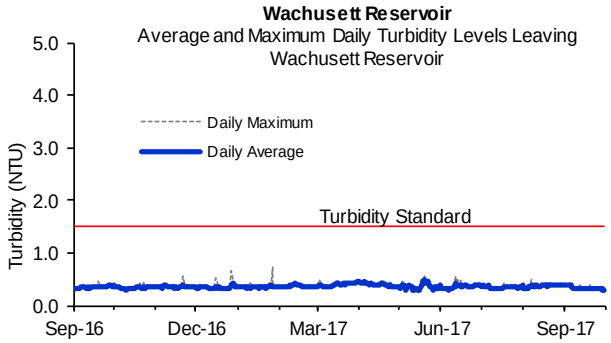
Turbidity is a measure of suspended and colloidal particles including clay, silt, organic and inorganic matter, algae and microorganisms. The effects of turbidity depend on the nature of the matter that causes the turbidity. High levels of particulate matter may have a higher disinfectant demand or may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

There are two standards for turbidity: all water must be below 5 NTU (Nephelometric Turbidity Units), and water only can be above 1 NTU if it does not interfere with effective disinfection.

Turbidity of Quabbin Reservoir water is monitored continuously at the Brutsch Water Treatment Facility (BWTF) before UV and chlorine disinfection. Turbidity of Wachusett Reservoir is monitored continuously at the Carroll Water Treatment Plant (CWTP) before ozonation and UV disinfection.

Maximum turbidity results at Quabbin and Wachusett were within DEP standards for the quarter.



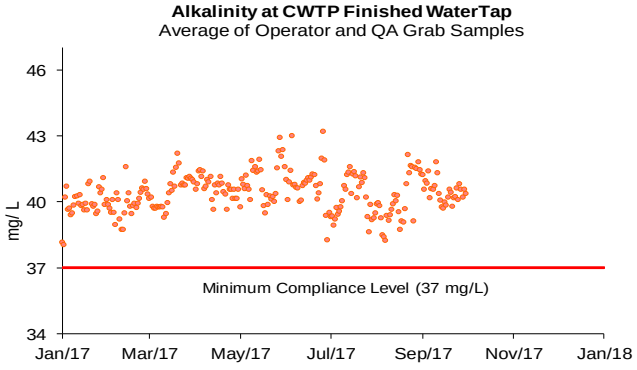


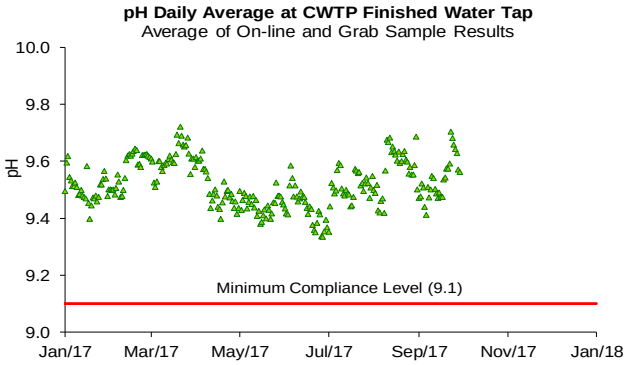
Treated Water – pH and Alkalinity Compliance

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

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

Distribution system samples were collected on September 6 and 7, 2017. Distribution system sample pH ranged from 9.0 to 9.6 and alkalinity ranged from 38 to 42 mg/L. No sample results were below DEP limits for this quarter.





Treated Water – Disinfection Effectiveness

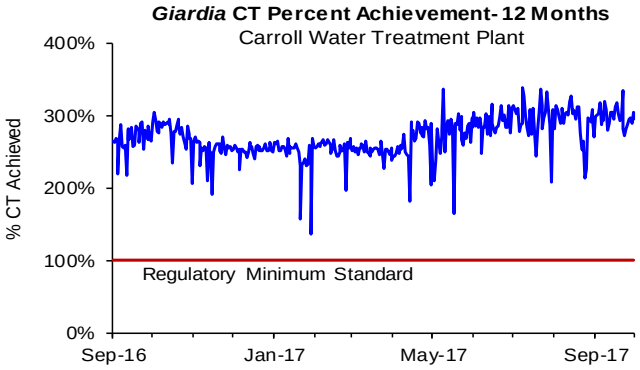
1st Quarter – FY18

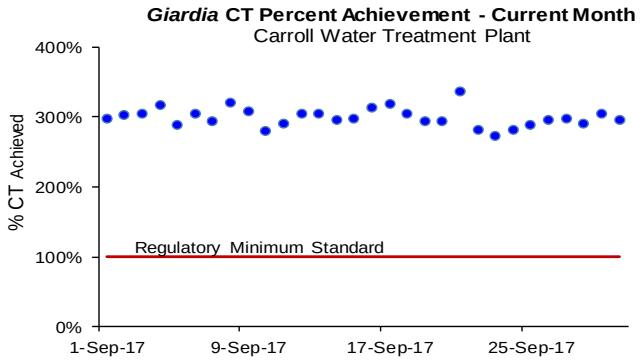
At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA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

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

Wachusett Reservoir – MetroWest/Metro Boston Supply:

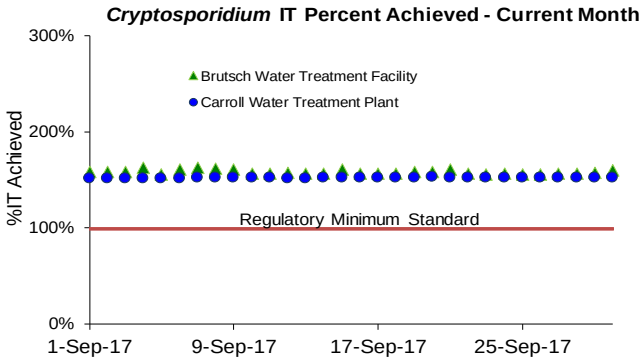
- Ozone dose at the CWTP varied between 1.2 to 2.8 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.

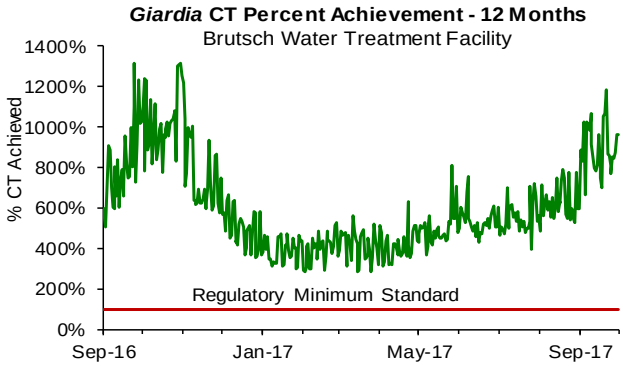


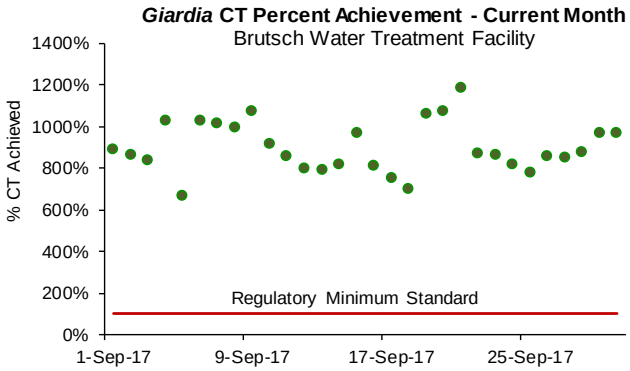


Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal target of >0.75 mg/L (November 01 – May 31) and >1.0 mg/L (June 1– October 31) at Ludlow Monitoring Station.
- The chlorine dose at BWTF ranged from 1.7 to 1.8 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system for the quarter.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.







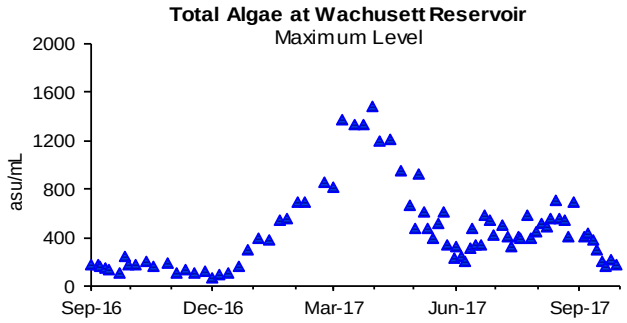
Source Water - Algae

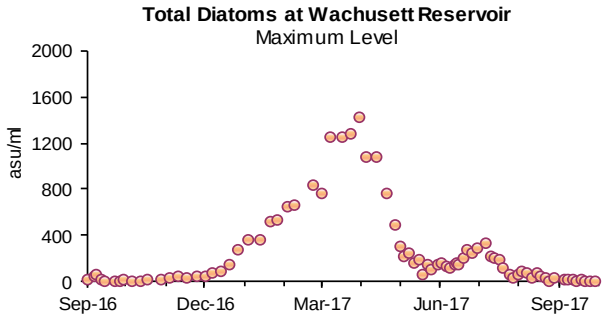
1st Quarter – FY18

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

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

In the 1st Quarter, three complaints which may be related to algae were reported from the local water departments.



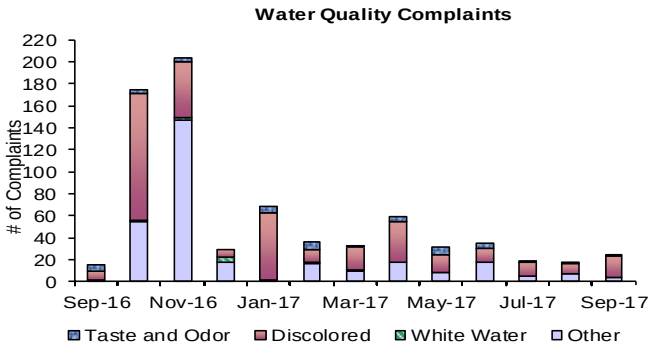


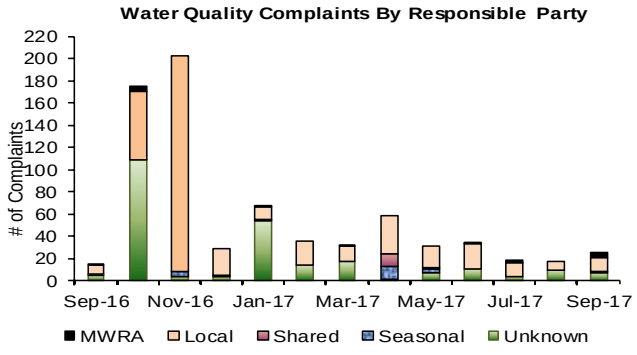
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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

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

Communities reported 61 complaints during the quarter compared to 179 complaints from 1st Quarter of FY17. Of these complaints, 41 were for "discolored water", 4 were for "taste and odor", and 16 were for "other". Of these complaints, 33 were local community issues, 7 were MWRA related, 1 was a community and MWRA shared issue, and 20 were unknown in origin. The complaints were scattered amongst the communities.





Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

1st Quarter – FY18

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

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

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

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

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

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

Highlights

In the 1st Quarter, 66 of the 6,331 community samples submitted to MWRA labs for analysis tested positive for total coliform. Fourteen of the 1,995 MWRA samples tested positive for total coliform. In July, August, and September, Bedford had more than one positive total coliform sample; and therefore, will be required to conduct a Level 2 assessment. In September, Canton had more than one positive total coliform sample; and therefore, will be required to conduct a Level 1 assessment. In September, Somerville had greater than 5.0% of samples that were total coliform positive; and therefore, is required to conduct a Level 1 assessment. No sample tested positive for *E.coli*. Only 3.6% of the samples had a chlorine residual lower than 0.2 mg/L for the quarter. No community violated the TCR.

		# Coliform Samples (a)	Total Coliform # (%) Positive	E.coli # Positive	Assessment Required [e]	Violation [f]	Minimum Chlorine Residual (mg/L)	Average Chlorine Residual (mg/L)
MWRA		MWRA Locations	395	6 (1.52%)	0			1.80	2.63
	d	Shared Community/MWRA sites	1600	8 (0.50)	0			0.03	2.06
		Total: MWRA	1995	14 (0.70%)	0			0.03	2.19
Fully Served		ARLINGTON	159	1 (0.63%)	0			0.02	1.67
		BELMONT	104	0 (0%)	0			0.07	1.40
		BOSTON	786	2 (0.25%)	0			0.47	2.17
		BROOKLINE	224	0 (0%)	0			0.18	2.02
		CHELSEA	172	1 (0.58%)	0			1.16	2.42
		DEER ISLAND	52	0 (0%)	0			1.13	2.00
		EVERETT	169	0 (0%)	0			0.21	1.61
		FRAMINGHAM	237	1 (0.42%)	0			0.44	2.07
		LEXINGTON	115	0 (0%)	0			0.48	2.02
		LYNNFIELD	18	0 (0%)	0			0.07	1.01
		MALDEN	243	3 (1.23%)	0			0.03	1.77
		MARBLEHEAD	72	0 (0%)	0			0.86	2.19
		MEDFORD	221	0 (0%)	0			1.28	1.96
		MELROSE	117	0 (0%)	0			0.39	1.51
		MILTON	105	1 (0.95%)	0			0.35	1.86
		NAHANT	30	0 (0%)	0			0.90	1.72
		NEWTON	276	0 (0%)	0			0.10	1.90
		NORTHBOROUGH	48	0 (0%)	0			0.07	1.89
		NORWOOD	99	0 (0%)	0			0.11	1.50
		QUINCY	302	1 (0.33%)	0			0.07	1.41
		READING	133	1 (0.75%)	0			0.05	1.29
		REVERE	183	1 (0.55%)	0			1.12	2.02
		SAUGUS	104	0 (0%)	0			1.35	1.77
		SOMERVILLE	285	8 (2.81%)	0	Level 1	No	0.63	2.15
		SOUTHBOROUGH	30	0 (0%)	0			0.42	2.00
		STONEHAM	91	0 (0%)	0			1.24	2.19
		SWAMPSCOTT	54	0 (0%)	0			0.50	1.51
		WALTHAM	216	0 (0%)	0			0.59	2.18
		WATERTOWN	133	1 (0.75%)	0			0.63	1.91
		WESTBORO HOSPITAL	15	0 (0%)	0			0.08	0.19
		WESTON	45	0 (0%)	0			1.36	2.62
		WINTHROP	75	1 (1.33%)	0			0.02	1.42
		Total: Fully Served	*4913*	*22 (0.45%)*					
CVA & Partially Served	b	BEDFORD	87	25 (28.47%)	0	Level 2	No	0.02	1.34
		CANTON	115	11 (9.57%)	0	Level 1	No	0.01	0.84
		HANSCOM AFB	33	0 (0%)	0			0.26	1.26
		MARLBOROUGH	129	1 (0.78%)	0			0.03	2.34
		NEEDHAM	123	0 (0%)	0			0.08	0.81
		PEABODY	226	2 (0.88%)	0			0.47	1.74
		WAKEFIELD	144	0 (0%)	0			0.89	1.66
		WELLESLEY	119	2 (1.68%)	0			0.04	0.91
		WILMINGTON	87	0 (0%)	0			0.13	1.70
		WINCHESTER	91	0 (0%)	0			0.10	1.72
		WOBURN	201	2 (1.00%)	0			0.02	1.08
	c	SOUTH HADLEY FD1	63	1 (1.59%)	0			0.13	0.63
		Total: CVA & Partially Served	*1418*	*44 (3.10%)*					
		Total: Community Samples	*6331*	*66 (1.04%)*					

(a) The number of samples collected depends on the population served and the number of repeat samples required.
(b) These communities are partially supplied, and may mix their chlorinated supply with MWRA chloraminated supply.
(c) Part of the Chicopee Valley Aqueduct System. Free chlorine system.
(d) MWRA total coliform and chlorine residual results include data from 125 community pipe locations as described above. In most cases these community results are accurately indicative of MWRA water as it enters the community system; however, some are clearly strongly influenced by local pipe conditions. Residuals in the MWRA system are typically between 1.0 and 2.8 mg/L.
(e) The TCR requires an assesment be completed if more than 5% of all samples in a month are total coliform positive (or two or more samples are positive when fewer than 40 samples are collected each month).
(f) Some reasons a violation may occur: the required # of TCR samples is not collected; failure to report; an E.coli MCL violation; coliform treatment technique not followed properly; failure to conduct a level 1 or level 2 assessment within 30 days of trigger.

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

1st Quarter – FY18

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

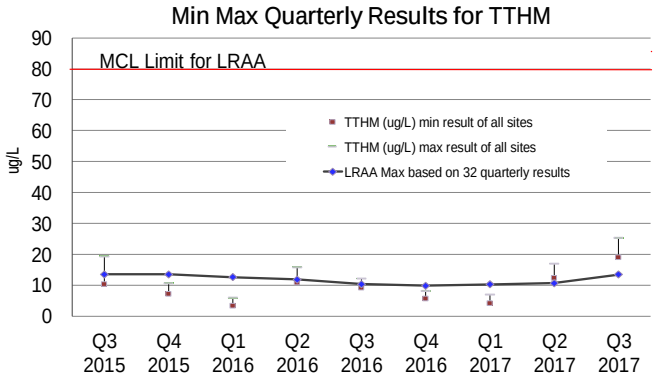
The locational running annual average at each individual sampling location must be below the standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

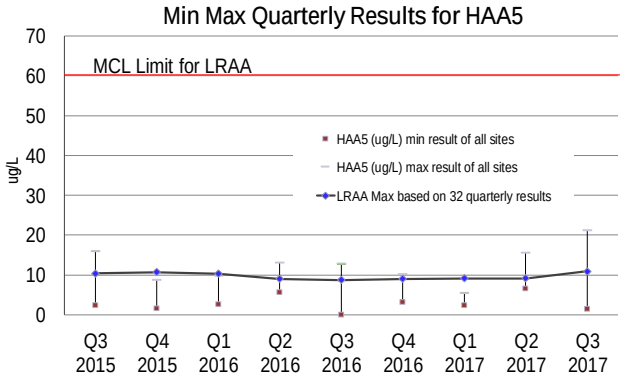
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1).

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

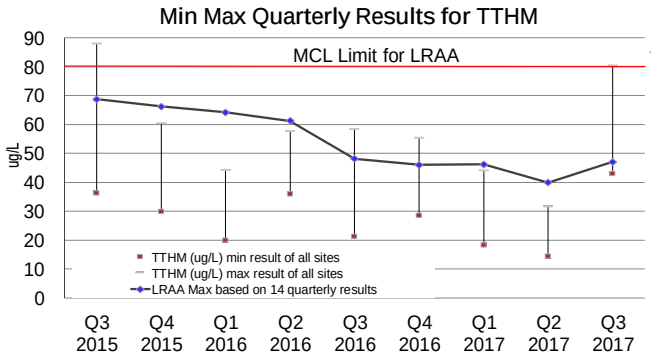
The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 13.4 ug/L; HAA5s = 10.9 ug/L. The current RAA for Bromate = 0.0 ug/L. CVA's DBP levels continue to be below current standards.

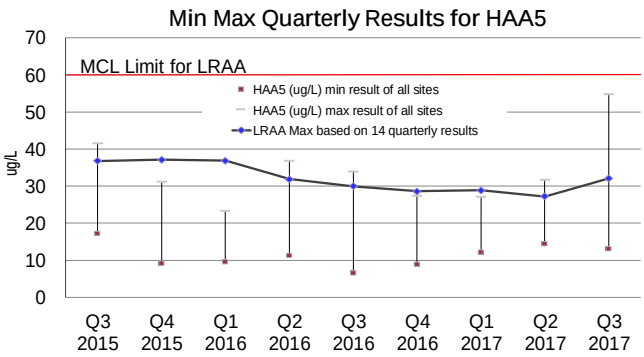
MetroBoston Disinfection By-Products





CVA Disinfection By-Products (Combined Results)





Water Supply and Source Water Management

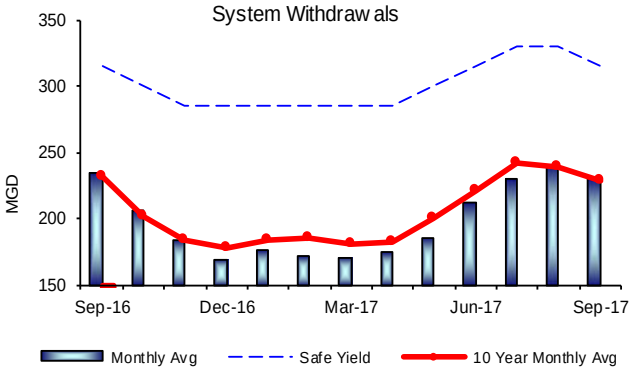
1st Quarter – FY18

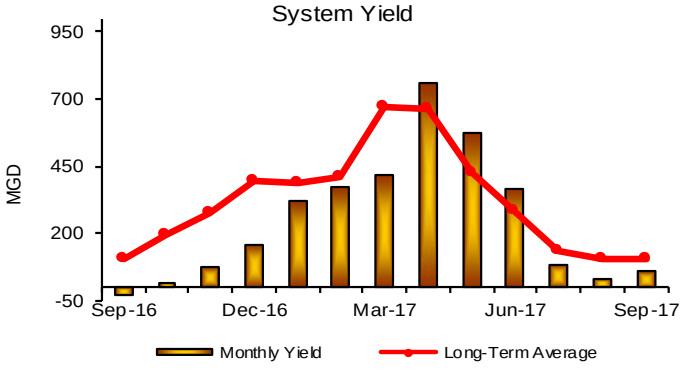
Background

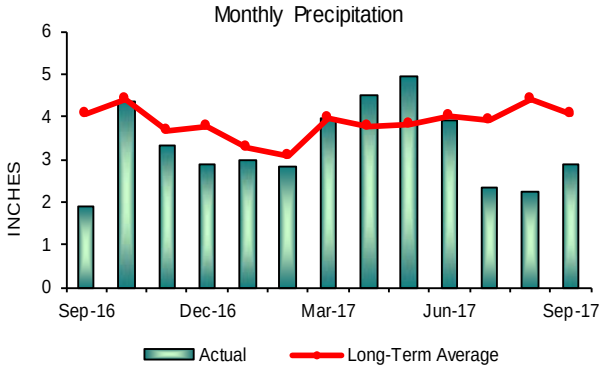
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir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

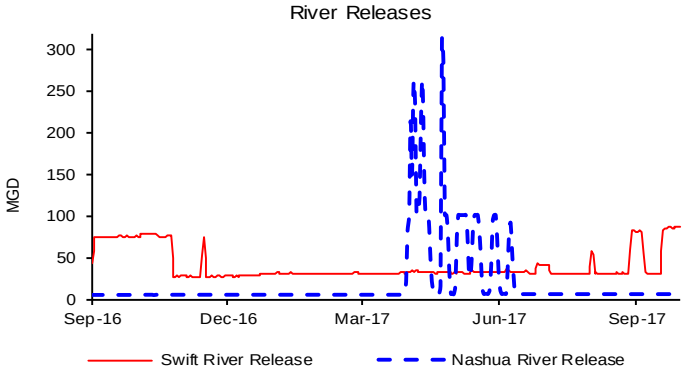
Outcome

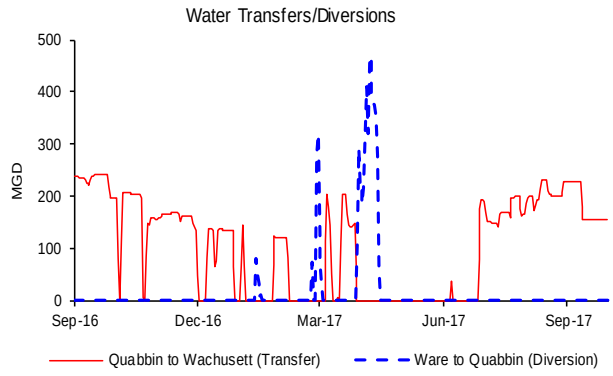
The volume of the Quabbin Reservoir was at 84.5% as of September 30, 2017; a 4.8% decrease for the quarter, which represents a loss of 20.1 billion gallons of storage. Precipitation and Yield for the quarter were below their respective quarterly long term averages. System withdrawal for the quarter was below the 10 year monthly average.

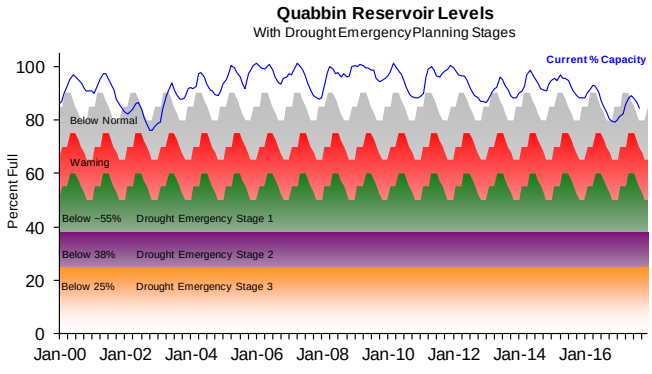












WASTEWATER QUALITY

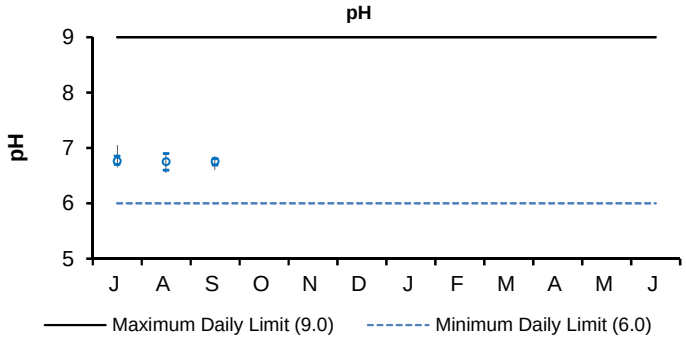
NPDES Permit Compliance: Deer Island Treatment Plant

1st Quarter - FY18

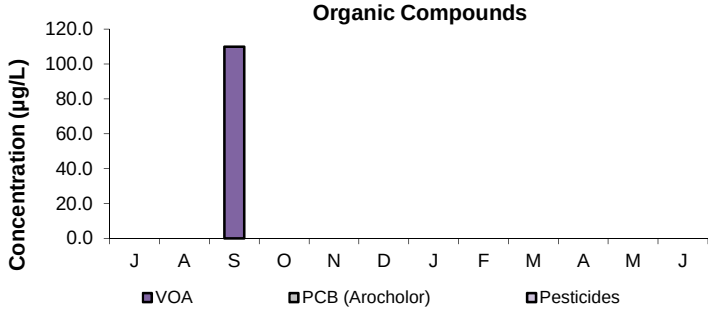
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*July*	*August*	*September*	*1st Quarter Violations*	*FY18 YTD Violations*
Dry Day Flow:		mgd	436	276.7	279.5	281.3	0	0
cBOD:	Monthly Average	mg/L	25	4.2	5.2	4.4	0	0
	Weekly Average	mg/L	40	5.3	5.8	7.0	0	0
TSS:	Monthly Average	mg/L	30	7.9	9.6	6.5	0	0
	Weekly Average	mg/L	45	10.2	12.4	10.9	0	0
TCR:	Monthly Average	ug/L	456	0	0	0	0	0
	Daily Maximum	ug/L	631	0	0	0	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	7	6	7	0	0
	Weekly Geometric Mean	col/100mL	14000	19	10	18	0	0
	% of Samples >14000	%	10	0	0	0	0	0
	Consecutive Samples >14000	#	3	0	0	0	0	0
pH:		SU	6.0-9.0	6.7-7.1	6.6-6.9	6.6-6.9	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	50	100	100	0	0
	Inland Silverside	%	≥1.5	100	50	50	0	0

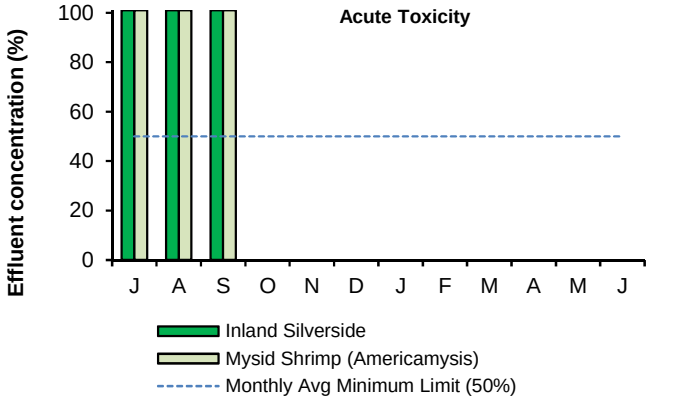
There have been no permit violations in FY18 to date at the Deer Island Treatment Plant (DITP).



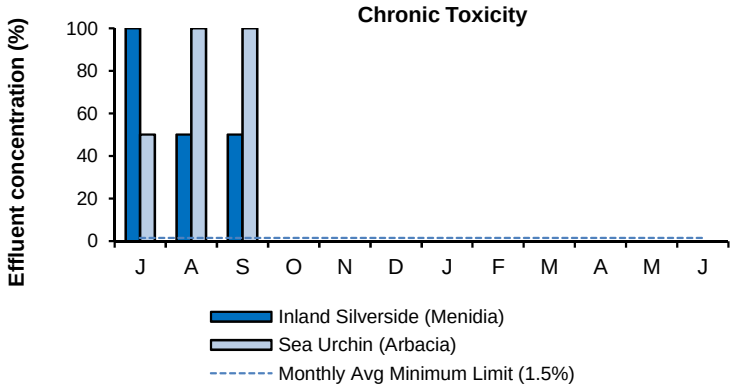
pH is a measure of alkalinity or acidity. Fluctuations in effluent pH are unlikely to impact on marine environments, which have significant buffering capacity. Because of the pure oxygen used in the activated sludge process, effluent pH tends to be at the lower end of the permit-required range. All pH measurements for the 1st Quarter were within the daily permit limits.



An important wastewater component monitored in the effluent is organic compounds, such as volatile organic acids (VOAs), pesticides, and polychlorinated biphenyls, which are all sampled monthly. The secondary treatment process significantly reduces organic compounds in the effluent stream. In the 1st Quarter, some VOAs (acetone and toluene) were detected in the effluent in September. However, VOAs do not have discharge limitations in the DITP NPDES permit; they are to be reported only. Though September had the highest measured VOAs since FY00, DITP has seen similar results before. Looking ahead, results from the October sampling showed the VOAs were again non-detect. All other organic compounds were below the detection limit for the quarter.



The acute toxicity test simulates the short-term toxic effects of chemicals in wastewater effluent on marine animals. The test measures the concentration (percent) of effluent that kills half the test organisms within four days. The higher the concentration of effluent required, the less toxic the effluent. For permit compliance, the effluent concentration that causes mortality to mysid shrimp and inland silverside must be at least 50%. Acute toxicity permit limits were met for the 1st Quarter for both the inland silverside and mysid shrimp.



Typically, effects of chronic exposures differ from those of acute exposures. Because of this, chronic toxicity responses are not necessarily related to acute toxicity. The chronic toxicity test simulates the long-term toxic effects of chemicals in wastewater effluent on marine animals. To meet permit limits, a solution of 1.5% effluent and 98.5% dillution water must show no observed effect on the growth and reproduction of the test species. Chronic toxicity permit limits were met for the 1st Quarter for both the inland silverside and sea urchin.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant

1st Quarter - FY18

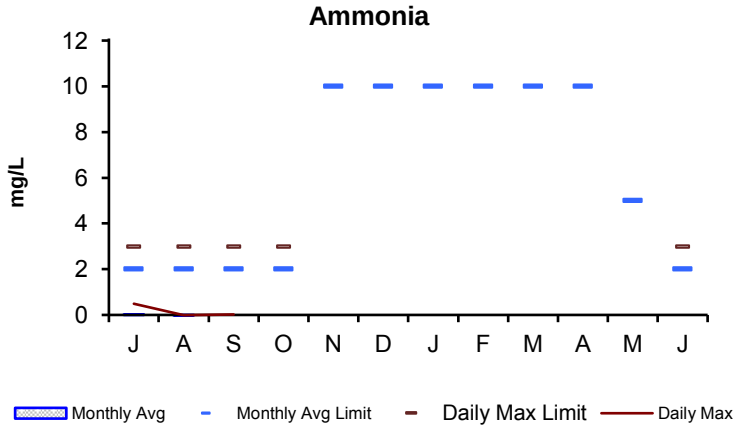
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*July*	*August*	*September*	*4th Quarter Violations*	*FY18 YTD Violations*
Flow:		mgd	3.01	2.40	2.40	2.42	0	0
BOD:	Monthly Average:	mg/L	20	2.5	3.3	3.4	0	0
	Weekly Average:	mg/L	20	3.9	3.6	3.9	0	0
TSS:	Monthly Average:	mg/L	20	3.1	3.0	3.7	0	0
	Weekly Average:	mg/L	20	5.4	3.5	4.5	0	0
pH:		SU	6.5-8.3	7.4-7.7	7.3-7.7	7.3-7.8	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	7.5	7.4	7.9	0	0
E. Coli:	Daily Geometric Mean:	cfu/100mL	409	15.0	8.7	29.0	0	0
	Monthly Geometric Mean:	cfu/100mL	126	5.6	5.4	6.0	0	0
TCR:	Monthly Average:	ug/L	17.6	0.0	0.0	0.0	0	0
	Daily Maximum:	ug/L	30.4	0.0	0.0	0.0	0	0
Total Ammonia Nitrogen:	June 1st - October 31st							
	Monthly Average:	mg/L	10.0	0.04	0.00	0.01	0	0
	Daily Maximum:	mg/L	35.2	0.50	0.00	0.04	0	0
Copper:	Monthly Average:	ug/L	11.6	10.2	10.1	8.4	0	0
	Daily Maximum:	ug/L	14.0	10.2	10.1	10.0	0	0
Phosphorus:	April 1st - October 31st							
	Monthly Average:	mg/L	1.0	0.57	0.45	0.56	0	0
Acute Toxicity:	Daily Minimum:	%	≥100	*N/A	*N/A	>100	0	0
Chronic Toxicity:	Daily Minimum:	%	≥62.5	*N/A	*N/A	100	0	0

There have been no permit violations in FY18 at the Clinton Treatment Plant.
1st Quarter: There were no permit violations in the first quarter.

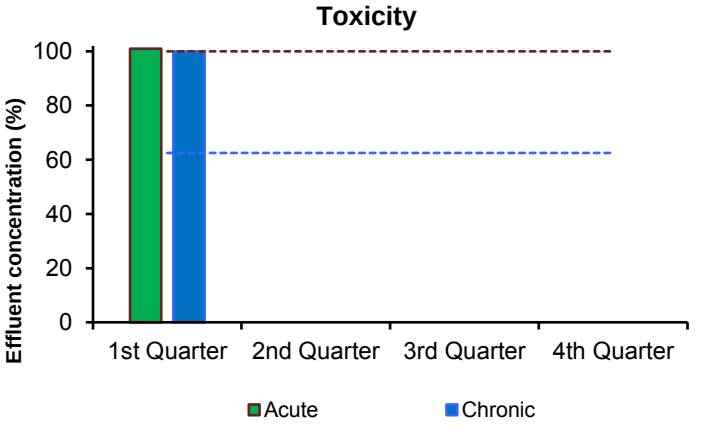
*Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.

Ammonia

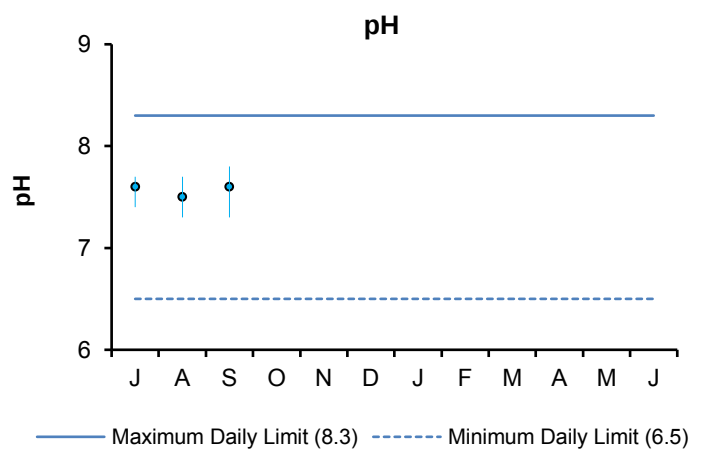


The 4th Quarter's monthly average and daily maximum concentrations were below the permit limits. The monthly average and daily maximum limits for the 1st Quarter are 2 mg/L and 3 mg/L, respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.

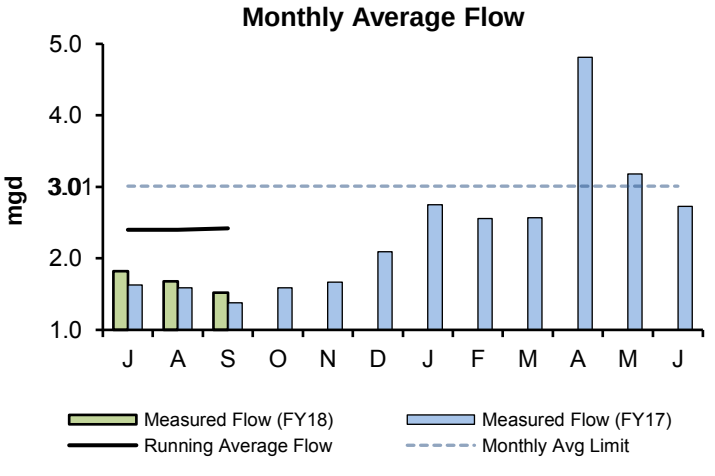
Toxicity



Acute and chronic toxicity testing simulates the short- and long-term toxic effects of chemicals in wastewater effluent on aquatic animals. For permit compliance, the effluent concentration that causes mortality to the daphnid in acute and chronic testing must be at least >100% and 62.5%, respectively. There were no violations in the 1st Quarter.



pH is a measure of the alkalinity or acidity of the effluent. All daily pH results for the 1st Quarter were within the range set by the permit.



The graph depicts the running annual average monthly flow, measured in million gallons per day, exiting the plant. The average monthly flows during the first quarter were below the NPDES permit limit.

COMMUNITY FLOWS AND PROGRAMS

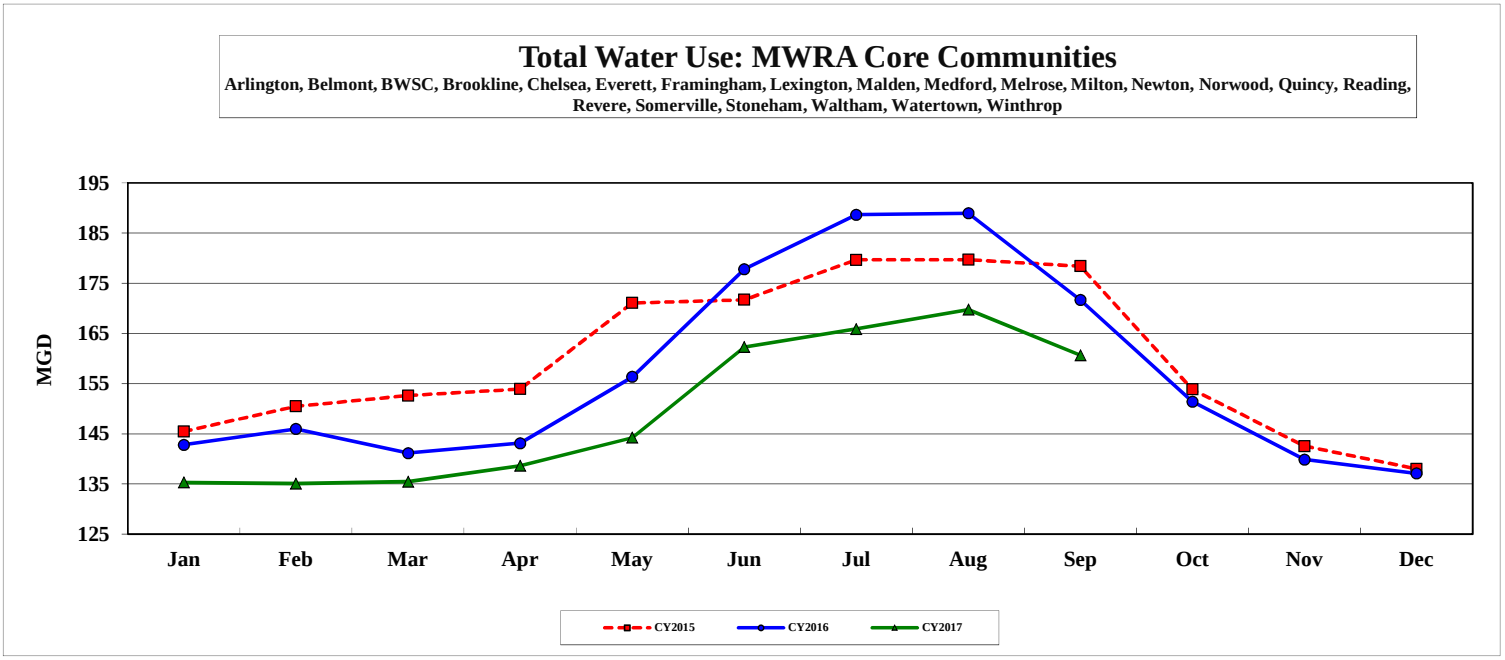
Total Water Use
MWRA Core Customers
1st Quarter - FY18

Water Use: MWRA Fully Served Communities*

*** Receive 100% MWRA Water Service**

MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Average
CY2015	145.466	150.488	152.603	153.932	171.068	171.693	179.652	179.689	178.407	153.846	142.547	138.005	159.839	159.839
CY2016	142.802	145.930	141.117	143.104	156.336	177.803	188.652	188.959	171.633	151.405	139.847	137.094	161.905	157.106
CY2017	135.309	135.085	135.461	138.599	144.237	162.273	165.876	169.746	160.650				149.808	149.808

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Total	Total
CY2015	4,509.447	4,213.655	4,730.692	4,617.960	5,303.114	5,150.793	5,569.210	5,570.350	5,352.198	4,769.225	4,276.398	4,278.141	58,341.183	58,341.183
CY2016	4,426.874	4,231.969	4,374.642	4,293.123	4,846.430	5,334.082	5,848.205	5,857.743	5,148.989	4,693.548	4,195.395	4,249.903	44,362.055	57,500.901
CY2017	4,194.586	3,782.379	4,199.303	4,157.984	4,471.359	4,868.181	5,142.169	5,262.132	4,819.512				40,897.604	40,897.604



The September 2017 Community Water Use Report recently distributed to communities served by the MWRA waterworks systems. Each community's annual water use relative to the system as a whole is the primary factor in allocating the annual water rate revenue requirement to MWRA water communities. Calendar year 2017 water use will be used to allocate the FY19 water utility rate revenue requirement.

September 2017 water supplied of 205.8 mgd (for revenue generating users) is down 24.8 mgd or 10.8% compared to September 2016.

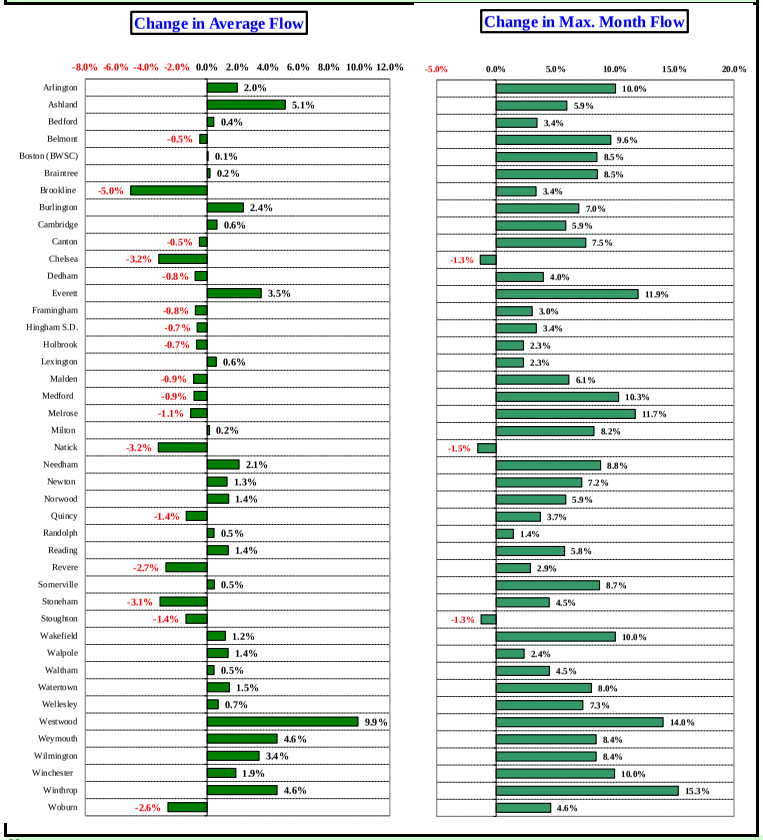
System-wide year to date consumption for CY17 remains lower than CY16 with 186.8 mgd being supplied to MWRA customers **through September**. This is 19.4 mgd lower than CY16, and is a decrease of 9.4%.

Community Wastewater Flows

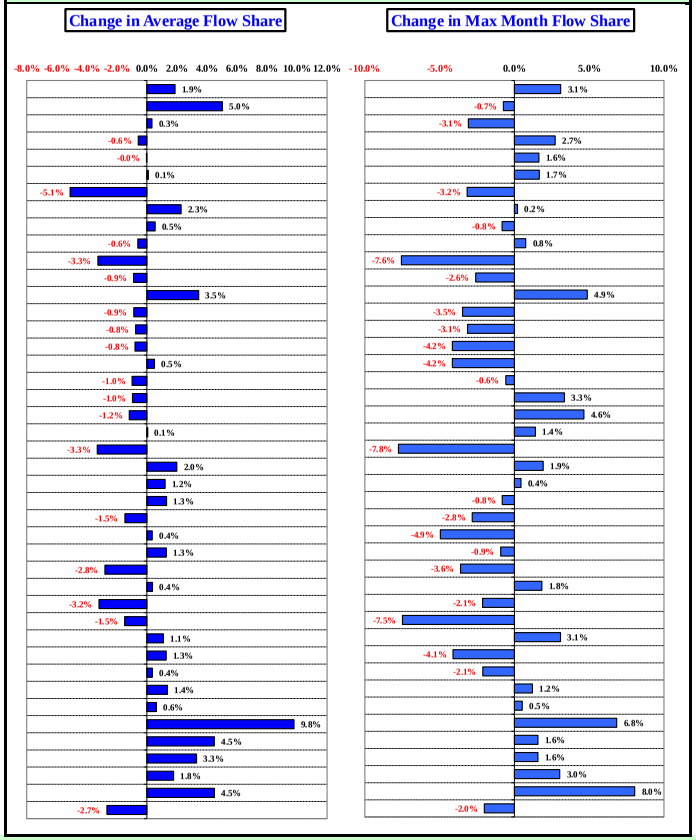
1st Quarter - FY18

How Projected CY2017 Community Wastewater Flows Could Effect FY2019 Sewer Assessments [1,2,3]

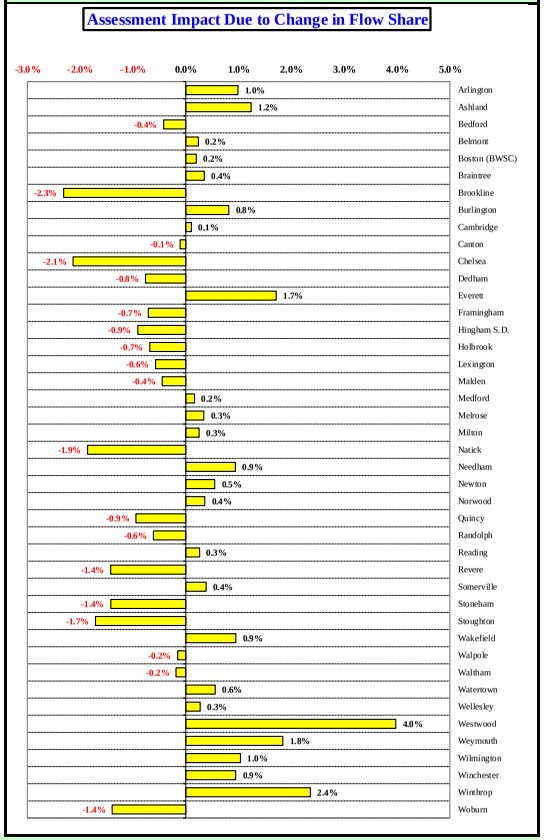
The flow components of FY2019 sewer assessments will be calculated using a 3-year average of CY2015 to CY2017 wastewater flows compared to FY2018 assessments that used a 3-year average of CY2014 to CY2016 wastewater flows.



But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2015 to CY2017 flow share compared to CY2014 to CY2016 flow share, compared to all other communities in the system.



The chart below illustrates the change in the TOTAL BASE assessment due to FLOW SHARE CHANGES. [4]



Notes:

[1] MWRA uses a 3-year flow average to calculate sewer assessments. Three-year averaging smoothes the impact of year-to-year changes in community flow share, but does not eliminate the long-term impact of changes in each community's relative contribution to the total flow.

[2] Based on CY2014 to CY2017 average wastewater flows as of 10/12/17. Flow data is preliminary and subject to change pending additional MWRA and community review.

[3] CY2014 to August CY2017 wastewater flows based on actual meter data. September-December CY2017 based on the average of the three prior years.

[4] Represents ONLY the impact on the total BASE assessment resulting from the changes in average and maximum wastewater FLOW SHARES.

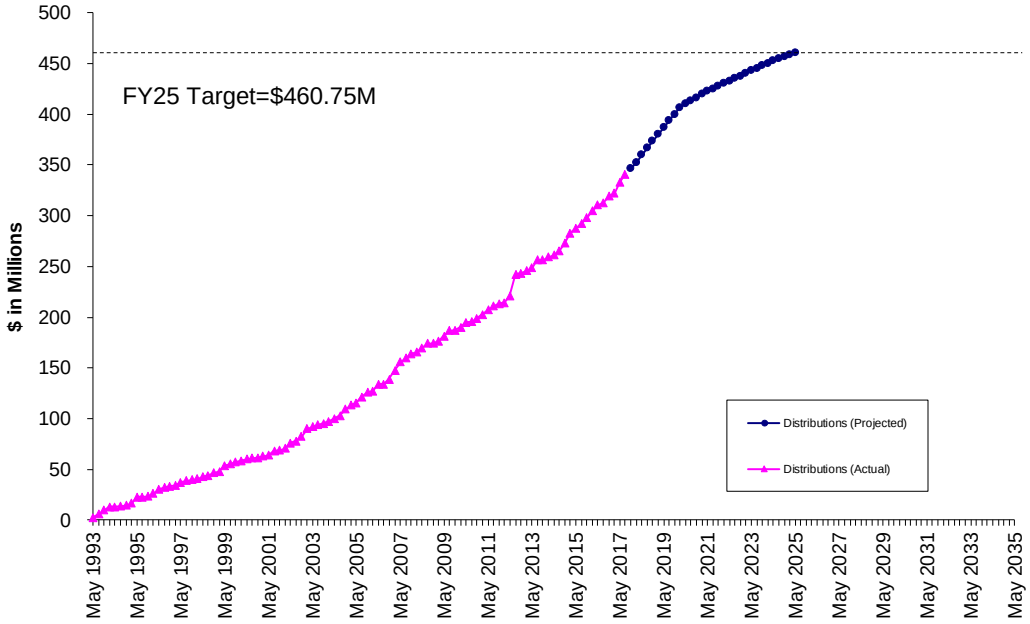
Community Support Programs

1st Quarter – FY18

Infiltration/Inflow Local Financial Assistance Program

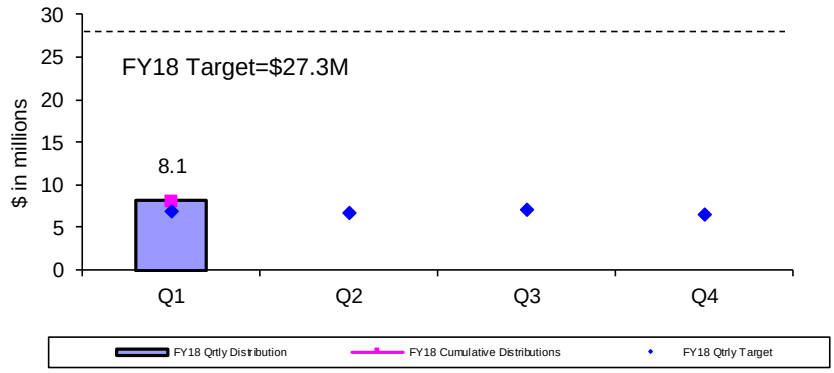
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides $460.75 million in grants and interest-free loans (average of about $14 million per year from FY93 through FY25) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Eligible project costs include: sewer rehabilitation construction, pipeline replacement, removal of public and private inflow sources, I/I reduction planning, engineering design, engineering services during construction, etc. I/I Local Financial Assistance Program funds are allocated to member sewer communities based on their percent share of MWRA's wholesale sewer charge. Phase 1-8 funds (total $300.75 million) were distributed as 45% grants and 55% loans with interest-free loans repaid to MWRA over a five-year period. Phase 9 and 10 funds (total $160 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period.

I/I Local Financial Assistance Program Distribution FY93-FY25



During the 1st Quarter of FY18, $8.1 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Milton, Norwood, Quincy, Reading and Winchester. Total grant/loan distribution for FY18 is $8.1 million. From FY93 through the 1st Quarter of FY18, all 43 member sewer communities have participated in the program and more than $340 million has been distributed to fund 533 local I/I reduction and sewer system rehabilitation projects. Distribution of the remaining funds has been approved through FY25 and community loan repayments will be made through FY36. All scheduled community loan repayments have been made.

FY18 Quarterly Distributions of Sewer Grant/Loans



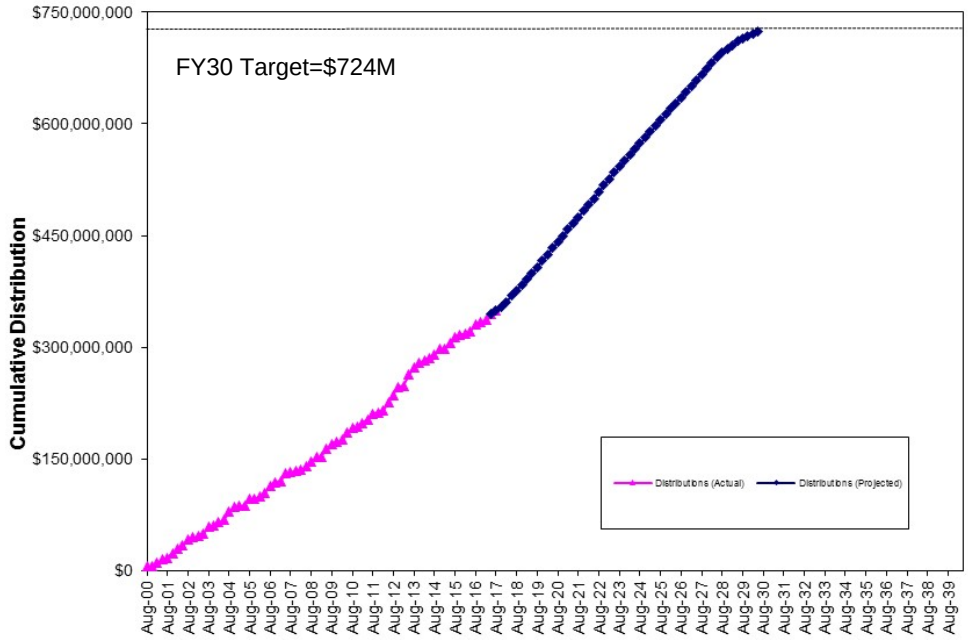
Community Support Programs

1st Quarter – FY18

Local Water System Assistance Program

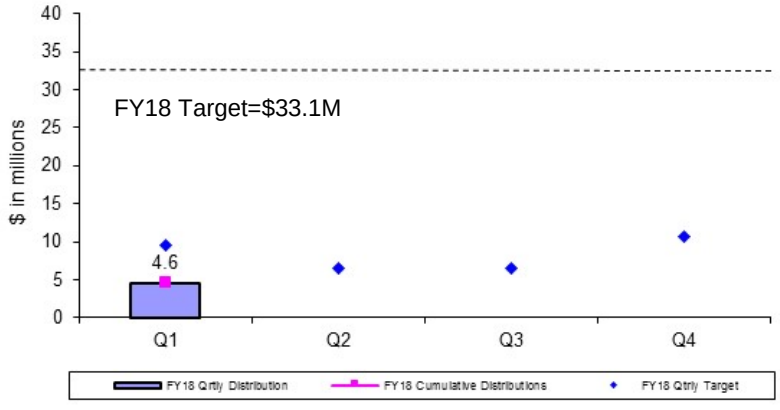
MWRA's Local Water System Assistance Programs (LWSAP) provides $724 million in interest-free loans (an average of about $24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have been 3 phases: Phase 1 at $222 Million, Phase 2 at $210 Million, and Phase 3 at $292 Million. Eligible project costs include: water main cleaning/lining, replacement of unlined water mains, lead service replacements, valve, hydrant, water meter, tank work, engineering design, engineering services during construction, etc. MWRA partially-supplied communities receive pro-rated funding allocations based on their percentage use of MWRA water. Interest-free loans are repaid to MWRA over a ten-year period beginning one year after distribution of the funds. The Phase 1 water loan program concluded in FY13 with $222 million in loan distributions. The Phase 2 - LWSAP continues distributions through FY23. The Phase 3 Water Loan Program is authorized for distributions FY18 through FY30.

Local Water System Assistance Program Distribution FY01-FY30



During the 1st Quarter of FY18, $4.6 million in interest-free loans was distributed to fund local water projects in Belmont, Medford, Melrose, Norwood and Wilmington. Total loan distribution for FY18 is $4.6 million. From FY01 through the 1st Quarter of FY18, more than $349 million has been distributed to fund 391 local water system rehabilitation projects in 39 MWRA member water communities. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY18 Quarterly Distributions of Water Loans



Community Support Programs

1st Quarter – FY18

Lead Service Line Replacement Loan Program

By its vote on March 16, 2016, the Board approved an enhancement to the Local Water System Assistance Program to provide up to $100 million in 10-year zero-interest loans to communities solely for efforts to fully replace lead service lines. The Lead Service Line Replacement Loan Program is also referenced as the Lead Loan Program or LLP. Each community can develop its own program, tailored to their local circumstances. MWRA's goal in providing financial assistance to member communities is to improve local water systems so that the high quality water MWRA delivers can make it all the way to the consumer's tap. The presence of a lead service line connecting a home to the main in the street can lead to elevated lead levels in tap water, especially if that water sits stagnant for an extended period. MWRA's stable water quality and effective corrosion control treatment reduce the risk that a lead service line will cause elevated lead levels, and measured lead levels in high risk homes have decreased by 90 percent since corrosion control was brought on-line in 1996. However, the risk of elevated levels remains as long as lead service lines are in use.

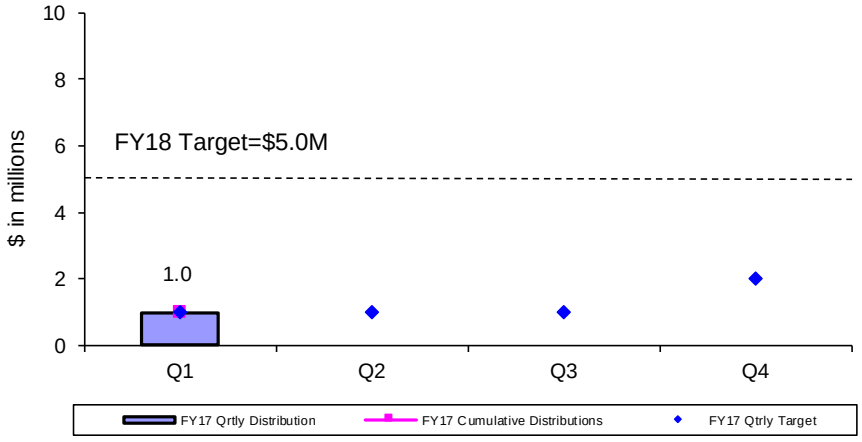
FY17 was the first year of the Lead Service Line Replacement Loan Program. During FY17, MWRA made three Lead Loan Program distributions to Newton for $4.0 Million, Quincy for $1.5 Million, and Winchester for $0.5 Million.

FY18 is the second year of the Lead Loan Program. During the 1st Quarter of FY18, one Lead Loan Program distribution was made to Marlborough for $1.0 Million

Summary of Lead Loans:

Marlborough in FY18	$1.0 Million
Newton in FY17	$4.0 Million
Quincy in FY17	$1.5 Million
Winchester in FY17	$0.5 Million
TOTAL	$7.0 Million

FY18 Quarterly Distributions of Lead Service Line Replacement Loans

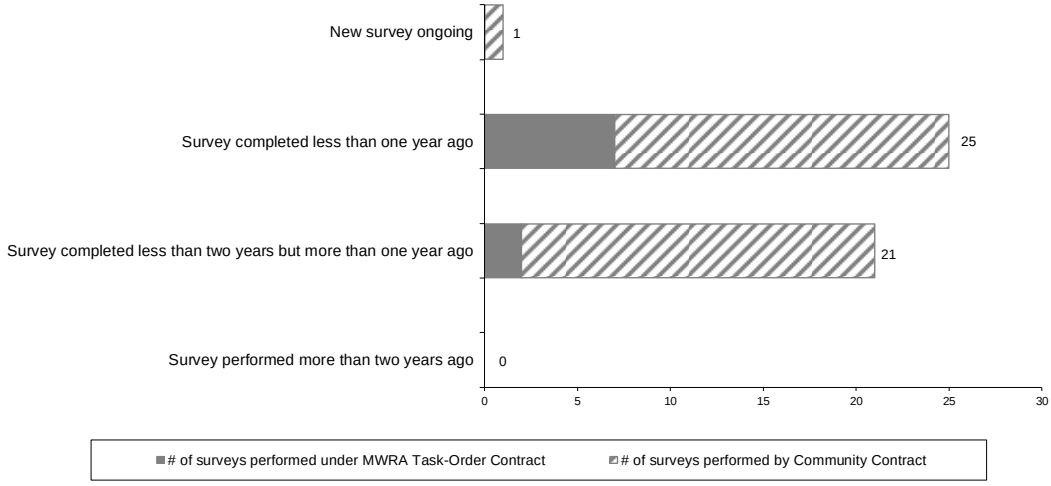


Community Support Programs

1st Quarter – FY18

Community Water System Leak Detection

To ensure member water communities identify and repair leaks in locally-owned distribution systems, MWRA developed leak detection regulations that went into effect in July 1991. Communities purchasing water from MWRA are required to complete a leak detection survey of their entire distribution system at least once every two years. Communities can accomplish the survey using their own contractors or municipal crews; or alternatively, using MWRA's task order leak detection contract. MWRA's task order contract provides leak detection services at a reasonable cost that has been competitively procured (3-year, low-bid contract) taking advantage of the large volume of work anticipated throughout the regional system. Leak detection services performed under the task order contract are paid for by MWRA and the costs are billed to the community the following year. During the 1st Quarter of FY18, all member water communities were in compliance with MWRA's Leak Detection Regulation.



Community Water Conservation Outreach

MWRA's Community Water Conservation Program helps to maintain average water demand below the regional water system's safe yield of 300 mgd. Current 5-year average water demand is less than 205 mgd. The local Water Conservation Program includes distribution of water conservation education brochures (indoor and outdoor bill-stuffers) and low-flow water fixtures and related materials (shower heads, faucet aerators, toilet leak detection dye tabs, and instructions), all at no cost to member communities or individual customers. The Program's annual budget is $25,000 for printing and purchase of materials. Annual distribution targets and totals are provided in the table below. Distributions of water conservation materials are made based on requests from member communities and individual customers.

	Annual Target	Q1	Q2	Q3	Q4	Annual Total
Educational Brochures	100,000	1,770				1,770
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	2,018				2,018
Toilet Leak Detection Dye Tablets	------	6,126				6,126

BUSINESS SERVICES

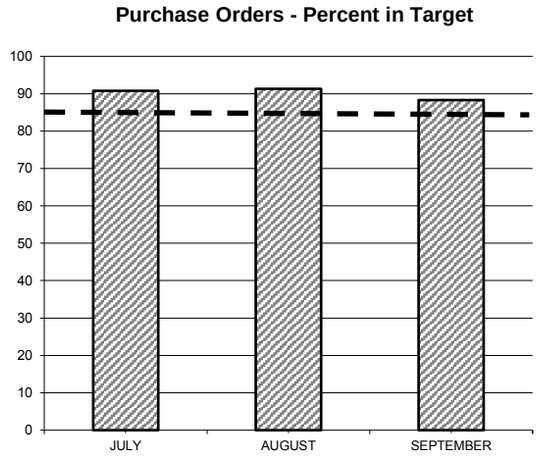
Procurement: Purchasing and Contracts

1st Quarter - FY18

Background: Goal is to process 85% of Purchase Orders and 80% of Contracts within Target timeframes.

Outcome: Processed 89.3% of purchase orders within target; Average Processing Time was 4.68 days vs. 4.69 days in Qtr 1 of FY17. Processed 62% (13 of 21) of contracts within target timeframes; Average Processing Time was 154 days vs. 101 days in Qtr 1 of FY17.

Purchasing



	No.	TARGET	PERCENT IN TARGET
$0 - $500	765	3 DAYS	83.9%
$500 - $2K	716	7 DAYS	93.8%
$2K - $5K	423	10 DAYS	93.1%
$5K - $10K	40	25 DAYS	85.0%
$10K - $25K	47	30 DAYS	87.2%
$25K - $50K	12	60 DAYS	66.6%
Over $50K	18	90 DAYS	77.7%

The Purchasing Unit processed 2021 purchase orders, 74 less than the 1947 processed in Qtr 1 of FY17 for a total value of $7,865,723 versus a dollar value of $2,639,781 in Qtr 1 of FY17.

The purchase order processing target was not met for the $0-$500 category due to item clarification and vendor sourcing; and the $25k- $50k and over $50k categories due to end user approvals and staff summary requirements.

Contracts, Change Orders and Amendments

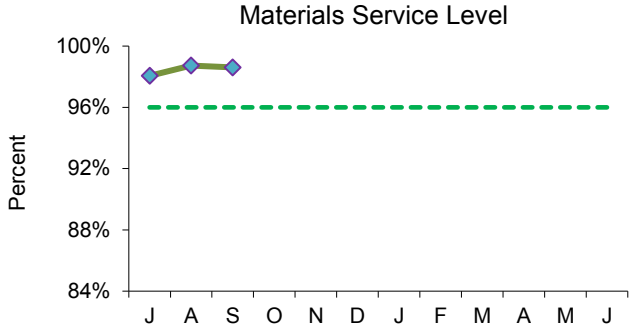
Eight contracts were not processed within the target timeframes. In two cases, the procurement process began in advance of the current contract expiration. The new contracts were in place according to schedule and budget needs. Another contract (Insurance Program Renewal FY18) was delayed due to additional procurement requirements necessary for insurance services. Insurance for all categories of coverage was obtained timely and according to schedule. A fourth contract was delayed due to an extended review of the contractor's qualifications; and another due to the addition and prioritization of an associated contract. A sixth contract was delayed due to compensation table and scope revisions. Another required re-evaluation of the submitted proposals, resulting in a delay of the contract award. The final contract was delayed due to the additional time required to respond to bidder questions, extensive revisions of the contract documents and later than anticipated issuance of third party construction permits.

Procurement processed twenty one contracts with a value of $40,513,676 and nine amendments with a value of $1,020,892. Twenty eight change orders were executed during the period. The dollar value of all non-credit change orders during Q1 FY18 was $3,265,831 and the value of credit change orders was ($586,703).

Staff reviewed 38 proposed change orders and 33 draft change orders.

Materials Management

1st Quarter - FY18



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,035 (98.5%) of the 7,140 items requested in Q1 from the inventory locations for a total dollar value of $958,972.

Inventory Value - All Sites

Inventory goals focus on:

- Maintaining optimum levels of consumables and spare parts inventory
- Adding new items to inventory to meet changing business needs
- Reviewing consumables and spare parts for obsolescence
- Managing and controlling valuable equipment and tools via the Property Pass Program

The FY18 goal is to reduce consumable inventory from the July '17 base level ($8.29 million) by 2.0% (approximately $165,849), to $8.12 million by June 30, 2018 (see chart below).

Items added to inventory this quarter include:

- Deer Island – thermostats and anti-vibration pads for HVAC; tig torches, plasma torches, drag shields, gouge tips and gouge shields for Welding Shop; locksets for Facilities; elbows, cables, housing brackets and housing for I&C; isolation rings and expansion joints for Liquid Train
- Chelsea – a/c filters, oil filters, fuel filters, gaskets, seals, fuel stabilizers and grease guns for Fleet Services; pump assembly and motor, HVAC timer and limit switches for Work Coordination; stove for warehouse; battery packs for Metering.
- Southboro – v-belts, filter cartridges and couplings for Equipment Maintenance; oil filters for Fleet Services and bearing guides and drive nut wipers for Carroll Water Treatment Plant.

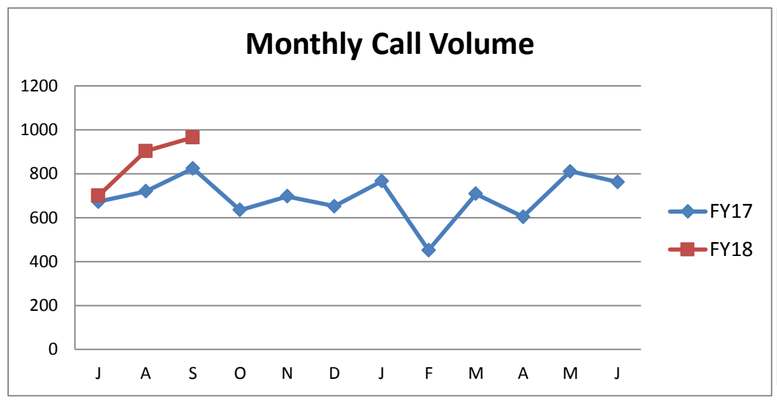
Property Pass Program:

- Five audits were conducted during Q1.
- Scrap revenue received for Q1 amounted to $11,191. Year to date revenue received amounted to $11,191.
- Revenue received from online auctions held during Q1 amounted to $58,390. Year to date revenue received amounted to $58,390.

Items	Base Value July-17	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,292,452	8,471,461	179,009
Spare Parts Inventory Value	8,939,710	8,888,063	-51,647
Total Inventory Value	17,232,162	17,359,199	127,037

Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

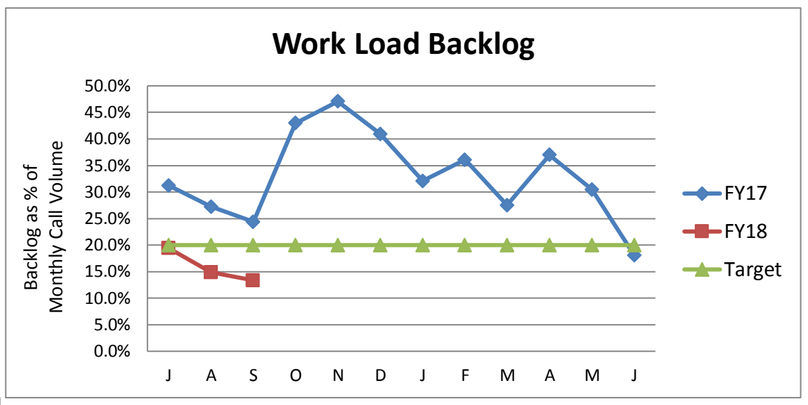
MIS Program
1st Quarter FY18

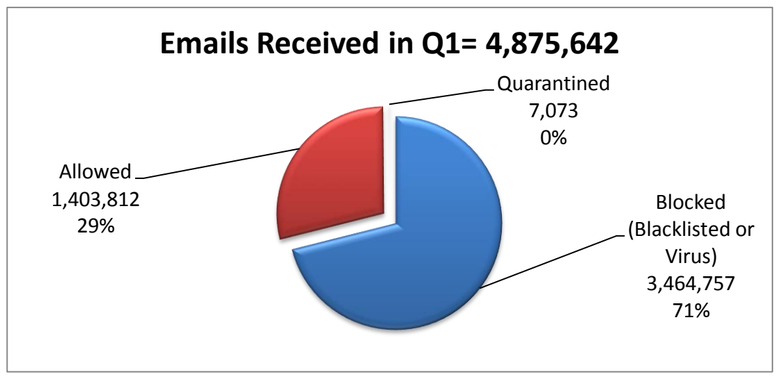


Performance & Backlog

Call Volume: Peaked in September. FY18-Q1 call volume increased by 18% from FY17-Q1.

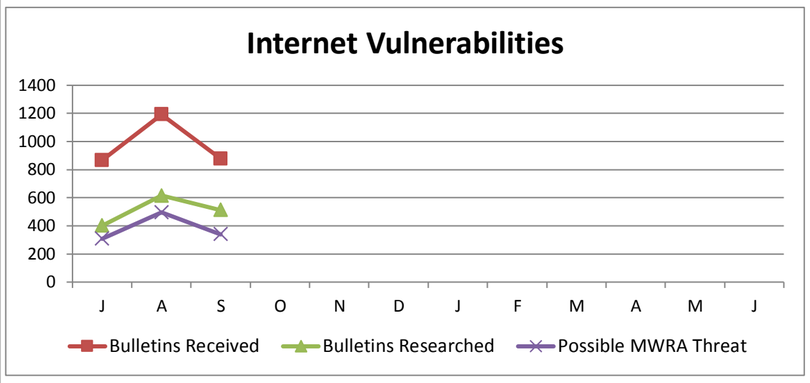
Call Backlog: Peaked in July. FY18-Q1 backlog average is 5% below the targeted benchmark of 20%.





Information Security

In Q1, pushed security fixes/ updates to desktops/servers protecting against 184 vulnerabilities. Landesk Antivirus quarantined 17 distinct viruses from 12 PCs. PCs are current with antivirus signatures for known



Infrastructure:

Office 2016 Upgrade: 91% of staff PCs have been upgraded. Continued supporting the testing of MS Access databases.

Server Virtualization: Completed migration of Management consoles to new hardware. New hardware received to replace individual physical servers with a virtualized host environment in CNY estimated completion date in late November.

Server Backup Solution Replacement: Hardware and software received. Scheduling implementation with vendor. Anticipated start in November.

Information Security Program: 28% of staff has completed the 2017 Security Awareness training; all staff must complete the training by March 2018.

Applications/Library & Records Center/Training:

e-Discovery Project:
Conducted a session with the vendor to configure the application for use at the MWRA. A User Acceptance Test (UAT) Plan was completed and approved. Began user testing using a past legal case as the test scenario. Scheduled a training session in October with Law users and the vendor.

Electronic Content Management (ECM) Project:
Participated in vendor demos of ECM products from two vendors, ranked as leaders by Gartner, to evaluate the products' functions and features and estimated product costs. Key members from the user community also attended the demos. Spoke with customers from several utilities and state agencies to collect feedback on their experiences with the product implementations, use, and vendor support.

Bouy-PI: Existing buoy data collection infrastructure upgraded to latest version of hardware and software. Architecture redesigned to leverage existing MWRA PI system for data storage and visualization.

LIMS:
DEP Auditors audited LIMS system last year provided recommendations to expand Control Chart functionality to include surrogate results for regular samples. Work in response to the audit was broken into two tasks. Task 1 - Control Chart Data Loads is complete. Task 2 - User-defined Specification Limits is in process.

Portia Upgrade: The upgrade to Portia is in production. Portia allows Treasury users to manage fixed investments and tracks interest and holdings on these investments.

Maximo Upgrade: Eleven of the 40 Maximo Crystal reports that were developed in-house have been accepted by users and put into production. The remaining are still being reviewed or have been put on hold.

PIMS:
Installed a new interface that utilizes tables instead of file system for TRAC invoice processing. Installed the Build 10.1.3 in production to resolve fixes to bugs and enhance functionality.

Library & Records Center:
The Library fulfilled 82 research requests, and provided 243 periodicals, standards, books and reports. Research topics included historical Quabbin water quality, aquatic invertebrates, Spot Pond Dam #1 drawings, CVA Redundancy 2008, corrosion control, safety and security, climate change, sea-level rise. The Records Center added 101 boxes, handled 239 boxes, disposed of 5 megabytes of records and attended 1 Records Conservation Board Meeting.

IT Training:
For the quarter, 203 staff attended 24 classes. 16% of the workforce has attended at least one class year-to-date. 155 staff attended the Office 2016 training held in 16 sessions at the Chelsea, Deer Island, Charlestown, Carroll Water Treatment Plant, and Southborough facilities. MAXIMO 7.6 training was offered. Customized quick references for Office 2016 applications for MS Excel, Access, Word, PowerPoint, and Outlook and began offering demos. Developed Lawson Excel Add-Ins application installation instructions for Desktop support or Helpline to use as needed.

Legal Matters
1st Quarter - FY18

PROJECT ASSISTANCE

Court and Administrative Orders:

- **Boston Harbor Litigation and CSO:** Reviewed comments by EPA, DEP, Mystic River Watershed Association, and Charles River Watershed Association on the CSO Post Construction Compliance Monitoring Program Scope of Work which MWRA submitted to DEP on May 1, 2017.

- **Administrative Consent Order (DITP power outages):** Drafted and submitted letter to DEP requesting that it formally close out ACOP-NE-04-1N003-SEP which is related to two DITP power outages in April in 2004.

Real Estate, Contract, Environmental and Other Support:

- **NPDES:** Reviewed and revised letter to EPA and DEP supplementing MWRA's application for renewal of its DITP NPDES Permit relating to CSO permit requirements. Reviewed and revised letter to EPA and DEP supplementing MWRA's application for renewal of its DITP NPDES Permit relating to indicator bacteria limits and dilution at DITP. Drafted letter to EPA and DEP supplementing MWRA's application for renewal of its DITP NPDES Permit relating to blending. Reviewed letter to EPA and DEP supplementing MWRA's application for renewal of its DITP NPDES Permit relating to ambient monitoring and the contingency plan. Reviewed cover letter for Carroll Water Treatment Plant's NPDES permit renewal application.

- **8(m) Permits:** Reviewed and approved sixty-five (65) 8(m) permits and one (1) direct connect permit.

- **Wireless Cell Agreements:** Reviewed and revised final Sprint wireless renewal cell permit agreement related to the installation, operation, maintenance, replacement and removal of communications equipment at MWRA's Turkey Hill water facility and AT&T wireless renewal cell permit agreements related to the installation, operation, maintenance, replacement and removal of communications equipment at MWRA's Turkey Hill and Walnut Hill water facilities.

- **Real Property:** Finalized license for UMass for access to and use of areas at Deer Island Nut Island on the coastal side of the coastal protection and/or seawalls for the purpose of studying the community composition of intertidal communities living on human-engineered shorelines. Drafted cease and desist order for unauthorized use of real property at Brattle Court in Arlington which is under the care, custody, and control of MWRA. Contacted MBTA relative to access by MWRA within its sewer easement on MBTA property in Dorchester to perform work on MWRA's Dorchester Interceptor. Finalized license for Wynn for access to and use of areas at DeLauri Pump Station related to the operation and maintenance of time lapse camera on an adjacent property. Drafted two (2) one day licenses for charitable events at Deer Island. Recorded certificate of compliance for order of conditions DEP 104-0971 related to work in Ware as part of MWRA Contract 7461 – Quabbin Power, Communications, and Security and certificate of compliance for order of conditions DEP 141-0483 related to work in Dedham as part of MWRA Contract 6453 – Southern Extra High Pipeline, Section 111. Drafted license between MWRA and Chelsea Soldier's Home for MWRA's use of a parking area in the event of an emergency. Reviewed and edited letter related to borings by MWRA at Boston Avenue in Medford as part of the WASM3 project.

- **Public Records Request:** Responded to six (6) public records request.

- **Watershed Preservation Restriction:** Reviewed Wachusett Reservoir Watershed Acquisitions W-001055 and W-001056 located at Justice Hill Road in Sterling, MA**.** Reviewed Quabbin Reservoir Watershed Acquisition, W-001178 for two (2) watershed preservation restrictions in Petersham, MA and Quabbin Reservoir Watershed Acquisition, W-001171 for a watershed preservation restriction in Petersham, MA**.**

- **Ogin Assignment for the Benefit of Creditors**: Staff negotiated and completed an agreement with Ogin's successor allowing an inoperable prototype wind turbine on MWRA property to be demolished.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters Two demands for arbitration was filed.

LITIGATION/TRAC --

New Matters There are no New Matters to report.

Significant Claims There are no Significant Claims to report.

Significant Developments

United States v. NSTAR Electric Company, et al., U.S.D.C. Civ. Action No. 16-11470-RGS: On July 12, 2017, a Stipulation and Order was signed by Judge Stearns in this matter staying the claims of the United States asserted on behalf of the Army Corps of Engineers re: Plaintiff's allegations of non-compliance with the Corps' 1989 permit allowing installation of the power cable to Deer Island. Later in July, Judge Stearns issued an order staying all cross-claims of the three defendants pending HEEC's compliance with a schedule to install the new cable and decommission the existing cable. MWRA submitted a letter of support to the Electric Facilities Siting Board in connection with HEEC's petition re: EFSB's lack of jurisdiction over the planned location of the new cable.

A Stipulation of Dismissal was filed in Fall River Electrical Associates Co., Inc. et al. v. Waterline Industries Corporation and MWRA: Suffolk Superior Court Civil Action No. 1584CV02383. This matter involved a 2015 bid protest by plaintiff Fall River Electrical on an MWRA project and was resolved by the Attorney General bid protest unit; dismissal of the court action was more of a formality as Fall River Electrical was ultimately awarded the project and there were no damages for it to claim.

Current Employee v. MWRA: Plaintiff is currently employed as an Environmental Scientist at Southboro. Plaintiff alleges that on February 2012, an arbitrator rendered an award in his favor as to retroactive pay and negotiation of an appropriate pay grade. Plaintiff seeks to confirm the alleged arbitration award and recover alleged lost income. The Complaint served by Plaintiff is devoid of supporting facts and a description of his claims; the summons and complaint are incorrectly headed as a Suffolk Superior Court filing when the case is actually filed in Middlesex County; and the Complaint fails to attach a copy of the alleged arbitration award. The MWRA filed a Motion to Dismiss for Failure to State a Claim on May 18, 2017. On July 31, 2017 the Court allowed MWRA's Motion to Dismiss on the grounds that the employee had no standing to enforce an arbitration award between MWRA and his union. Lastly, the complaint was filed outside the time limits permitted to bring a claim.

During the 1st Quarter of FY 2018, three new subpoenas were received and one subpoena was pending at the end of the 1st Quarter FY 2018.

During the First Quarter of FY 2018, twenty public records requests were received and fourteen public records requests were closed.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of Sept 2017	As of June 2017	As of Mar 2017
Construction/Contract/Bid Protest (other than BHP)	0	0	2
Tort/Labor/Employment	2	3	2
Environmental/Regulatory/Other	2	2	2
Eminent Domain/Real Estate	0	0	0
total – all defensive cases	**4**	**5**	**6**
Other Litigation matters (restraining orders, etc.) MWRA v. Thomas Mercer MWRA v. NSTAR and HEEC	2	2	2
total – all pending lawsuits	**6**	**7**	**8**
Claims not in suit: Joel Chiet Claim Besnick Lalaj and Violeta Lalaj Claim Thang Viet Vu and Oanh Vu Claim	3	3	3
Bankruptcy	2	2	1
Wage Garnishment	15	15	15
TRAC/Adjudicatory Appeals	1	2	3
Subpoenas	1	1	0
TOTAL – ALL LITIGATION MATTERS	**28**	**30**	**30**

TRAC/MISC.

New Appeals: No new TRAC appeals received.

Settlement by Agreement of Parties No Settlement by Agreement of Parties.

Stipulation of Dismissal One TRAC appeal filed a Joint Stipulation of Dismissal on September 29, 2017.
City Fresh Foods, Inc.; MWRA Docket No. 17-03

Notice of Dismissal Fine paid in full No cases of Notices of Dismissal, Fine paid in full.

Tentative Decision No Tentative Decisions were issued in the 1st Quarter FY 2018.

Decisions No Final Decisions was issued in the 1st Quarter FY 2018.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
1st Quarter FY18

Highlights
During 1st Quarter FY18, Internal Audit (IA) issued reports on the BWSC CSO Financial Assistance Agreement (FAA) for the final period of the agreement and City of Cambridge FAA for 2012 to 2015. Reports were also issued on the NEFCo operations of the Pellet Plant in Quincy and the CNY lease for CY16 operating expenses and FY17 real estate taxes.

IA completed three consultant preliminary reports and six preliminary construction labor burden reviews with contract values totaling $15.2 mill. and $45.9 mill., respectively. A final report on an incurred cost audit was also issued. Management advisory services included the calculations for the FY18 MWRA overhead rate, unemployment compensation review, and continuing support on HEEC.

Status of Recommendations
During 1st Quarter FY18, a total of 12 recommendations from prior fiscal years' audits were closed.

IA follows-up on open recommendations on a continuous basis. All open recommendations have target dates for implementation. When a recommendation has not been implemented within 48 months, the appropriateness of the recommendation is re-evaluated.

Report Title (issue date)	Audit Recommendations		
	Open	Closed	Total
Follow-Up Report on Fleet Services Activities (12/31/13)	1	16	17
Unmatched Receipts and Accruals (6/30/15)	3	7	10
Warehouse Cycle Counts at DITP (11/5/15), Southboro (11/6/15) and Chelsea (12/4/15)	2	23	25
MIS Mobile Equipment Asset Tracking (9/26/16)	1	11	12
Wright Express (WEX) Credit Card Fuel Purchases (11/16/16)	6	7	13
Purchase Card Activity on Deer Island (3/31/17)	4	11	15
Total Recommendations	***17***	***75***	***92***

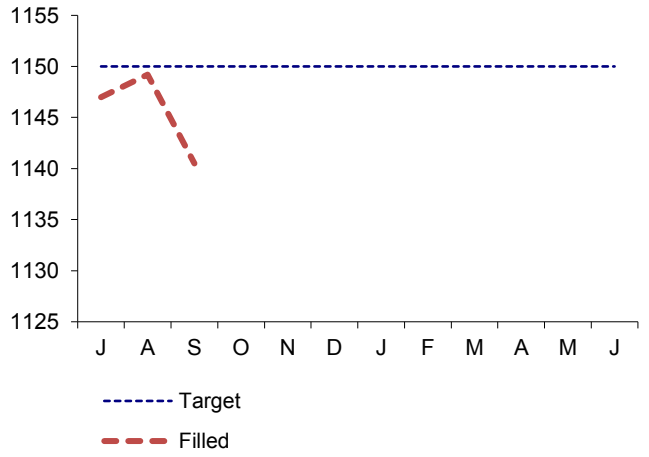
Cost Savings
IA's target is to achieve at least $1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

Cost Savings	FY14	FY15	FY16	FY17	FY18 Q1	TOTAL
Consultants	$294,225	$87,605	$88,312	$272,431	$42,491	$785,064
Contractors & Vendors	$415,931	$1,146,742	$1,772,422	$3,037,712	$692,865	$7,065,672
Internal Audits	$923,370	$543,471	$220,929	$224,178	$45,909	$1,957,857
Total	**$1,633,526**	**$1,777,818**	**$2,081,663**	**$3,534,321**	**$781,265**	**$9,808,593**

OTHER MANAGEMENT

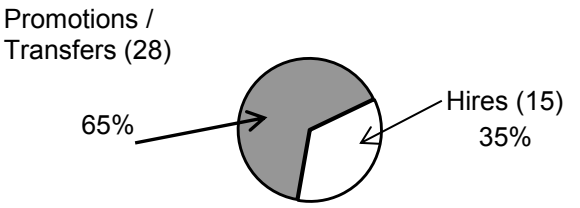
Workforce Management
1st Quarter FY18

FTE Tracking



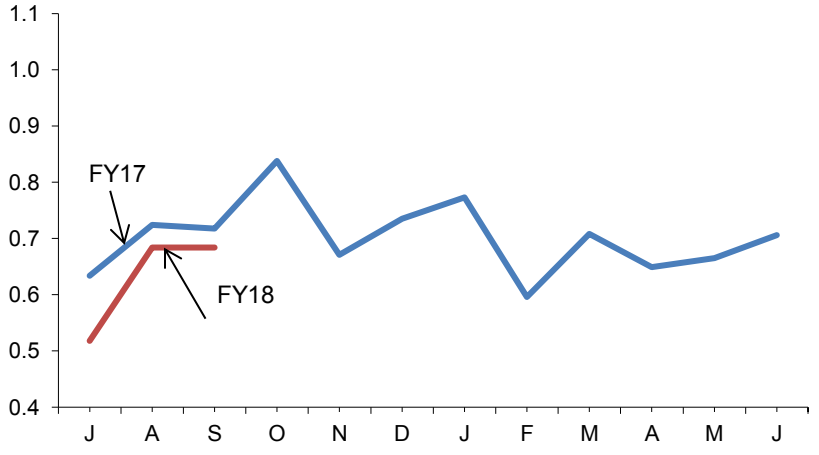
FY18 Target for FTE's = 1150
FTE's as of Sept 2017 = 1140.5

Positions Filled by Hires/Promotions
FY18-YTD



	Pr/Trns	Hires	Total
FY16	99 (62%)	60 (38%)	159
FY17	155 (68%)	72 (32%)	227
FY18-YTD	28 (65%)	15 (35%)	43

Average Monthly Sick Leave Usage
Per Employee



Average monthly sick leave for the 1st Quarter of FY18 decreased as compared to the 1st Quarter of FY17 (7.54 to 8.41 days)

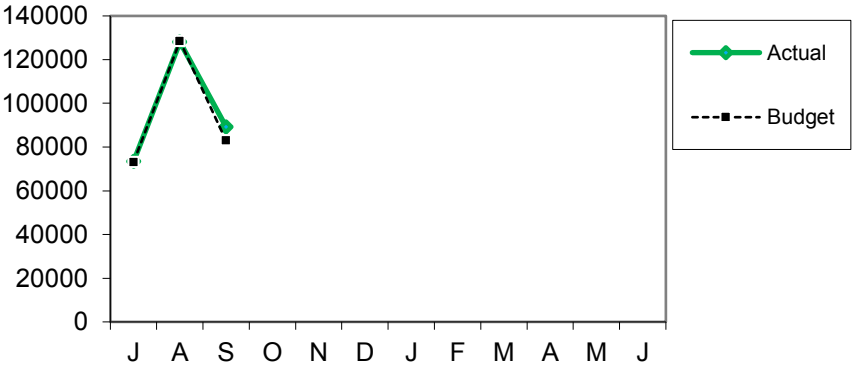
	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY17
Admin	136	1.32	5.29	22.0%	7.75
Aff. Action	6	1.10	4.38	0.0%	6.28
Executive	5	0.59	2.35	0.0%	13.80
Finance	36	1.35	5.40	5.0%	8.50
Int. Audit	7	0.93	3.72	0.0%	6.51
Law	15	1.51	6.05	8.6%	8.98
OEP	8	0.68	2.72	0.0%	5.74
Operations	934	1.74	6.94	17.4%	8.55
Pub. Affs.	14	2.73	10.92	74.7%	6.31
MWRA Avg	**1161**	**1.89**	**7.54**	**18.3%**	**8.42**

Percent of sick leave usage for FY18, attributable to Family and Medical Leave Act (FMLA) is 18.3% .

Field Operations
Current Month Overtime $

Total Overtime for Field Operations for the first quarter of FY 2018 was $822k which is $196k over budget. Planned overtime was $328 or $183k over budget, mainly for maintenance off-hours work to alleviate a project backlog in western ops due to staff vacancies, replacement of manholes in a community prior to a major repaving job, and crane rigging to hoist replacement HVAC units into place at the Chelsea maintenance facility. Emergency overtime was $342k, $35k over budget primarily due to wet weather response and emergency response for leak repair. Coverage overtime was $152k, which was ($22k) under budget, reflecting the month's shift coverage requirements.

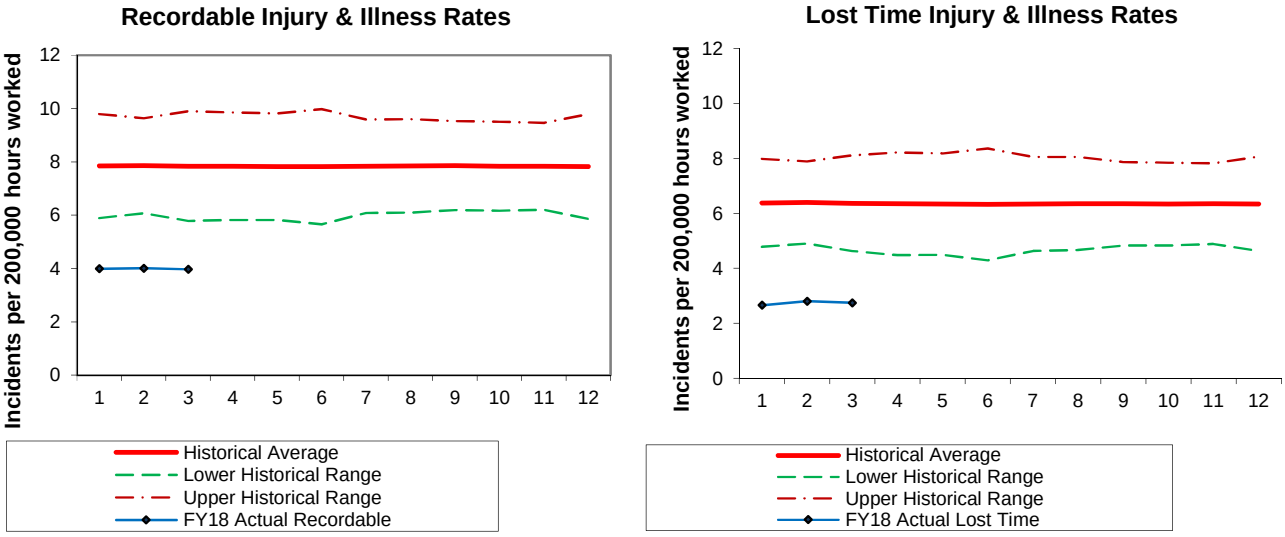
Deer Island Treatment Plant
Current Month Overtime $



Deer Island's total overtime expenditure in the first quarter of FY18 was $291K, which was $6K higher than the budget. Deer Island experienced higher than anticipated shift coverage requirements due a to Thermal Power Plant IA and vacant operator positions,$41k, offset by less than anticipated storm coverage requirements, ($27K) and lower than anticipated planned/unplanned overtime, ($7K). YTD, Deer Island has spent $290,604 on overtime which was $7K over budget.

Workplace Safety

1st Quarter - FY18



1 "Recordable" incidents are all work-related injuries and illnesses which result in death, loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid.

2 "Lost-time" incidents, a subset of the recordable incidents, are only those incidents resulting in any days away from work, days of restricted work activity or both - beyond the first day of injury or onset of illness.

3 The "Historical Average" is computed using the actual MWRA monthly incident rates for FY99 through FY14. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively. FY15 actual incident rates can be expected to fall within this historical range.

WORKERS COMPENSATION HIGHLIGHTS

	1st Quarter Information		
	New	Closed	Open Claims
Lost Time	6	12	64
Medical Only	11	21	16
Report Only	35	35	
	QYTD		FYTD
Regular Duty Returns	9		9
Light Duty Returns	2		2

COMMENTS:

Regular Duty Returns

JULY One Employee returned to full duty/no restrictions
AUG Three Employees returned to full duty/no restrictions
SEPT Five Employees returned to full duty/no restrictions

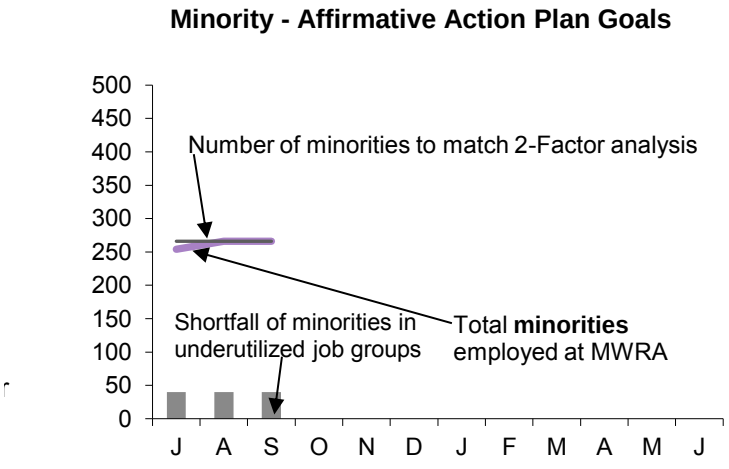
Light Duty Returns

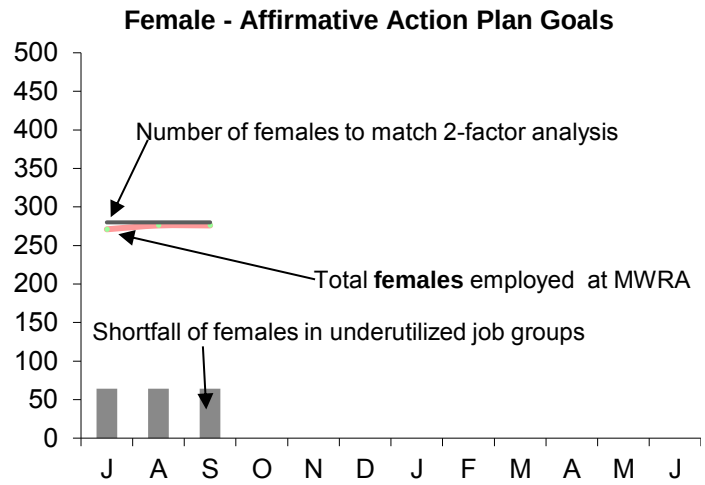
JULY N/A
AUG One employee returned to light duty
SEPT One employee returned to light duty

Note: Claims may initially be counted in one category and changed to another category at a later date. Examples include a medical treatment only claim (no lost time from work) but the employee may require surgery at a later date resulting in the claim becoming a lost time claim. At that time we would only count the claim as opened but not as a new claim.

*Report only claims are closed the month they are filed.

MWRA Job Group Representation
1st Quarter - FY18





Highlights:
At the end of Q1 FY18, 7 job groups or a total of 40 positions are underutilized by minorities as compared to 4 job groups or a total of 111 positions at the end of Q1 FY17; for females 10 job groups or a total of 64 positions are underutilized by females as compared to 8 job groups or a total of 31 positions at the end of Q1 FY17. During Q1, 5 minorities and 6 females were hired. During this same period 3 minorities and 6 females terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 9/30/2017	Minorities as of 9/30/2017	Achievement Level	Minority Over or Under Underutilized	Females As of 9/30/2017	Achievement Level	Female Over or Under Underutilized
Administrator A	21	2	2	0	7	6	1
Administrator B	21	1	4	-3	3	4	-1
Clerical A	35	13	10	3	30	15	15
Clerical B	27	9	7	2	10	8	2
Engineer A	75	21	17	4	16	15	1
Engineer B	62	18	14	4	14	7	7
Craft A	115	18	27	-9	1	8	-7
Craft B	148	27	33	-6	3	8	-5
Laborer	64	22	14	8	2	3	-1
Management A	98	15	24	-9	36	40	-4
Management B	45	8	7	1	9	5	4
Operator A	69	4	11	-7	1	3	-2
Operator B	63	13	12	1	4	18	-14
Professional A	34	5	8	-3	20	16	4
Professional B	161	46	42	4	80	53	27
Para Professional	61	19	22	-3	30	53	-23
Technical A	52	11	11	0	6	12	-6
Technical B	6	1	1	0	1	2	-1
Total	**1157**	**253**	**266**	**27/-40**	**273**	**276**	**61/-64**

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/Transfers	AACU Ref. External	Position Status
Administrator B	Assistant Director, Engineering	1	Int/Ext	Int	0	Trans = WM
Administrator B	Manager, Metering & Monitoring	1	Int/Ext	Int	0	Promo = WM
Craft A	Sr. Medium Electric Specialist	1	Int	Int	0	Promo = WM
Craft A	Valve Maintenance Foreman	1	Int/Ext	Int	0	Promo = WM
Craft B	Instrument Technician	1	Int	Int/Ext	0	NH = HM
Craft B	HVAC Specialist	1	Int	Int/Ext	**1**	In Progress
Clerical B	Inventory Control Specialist	1	Int/Ext	Int	0	Trans = WM
Engineer A	Program Manager, Energy Management	1	Int/Ext	Int/Ext	0	NH = WF
Laborers	Buildings and Grounds Supervisor	1	Int/Ext	Int/Ext	0	Promo = WM
Laborers	Supervisor, T&T Operations	1	Int/Ext	Int	0	Promo = WM
Management A	Manager, SCADA & Process Control	1	Int	Int	0	Promo = WM
Management A	Manager, Energy	1	Int/Ext	Int/Ext	0	NH = WM
Operator B	Operator	1	Int/Ext	Int	0	Promo = WM
Professional B	Chemist III	1	Int/Ext	Int	0	Promo = WF
Professional B	Regional Manager (Inspections)	1	Int/Ext	Int	0	Promo = BM
Professional B	Laboratory Supervisor III	1	Int/Ext	Int	0	Promo = WM

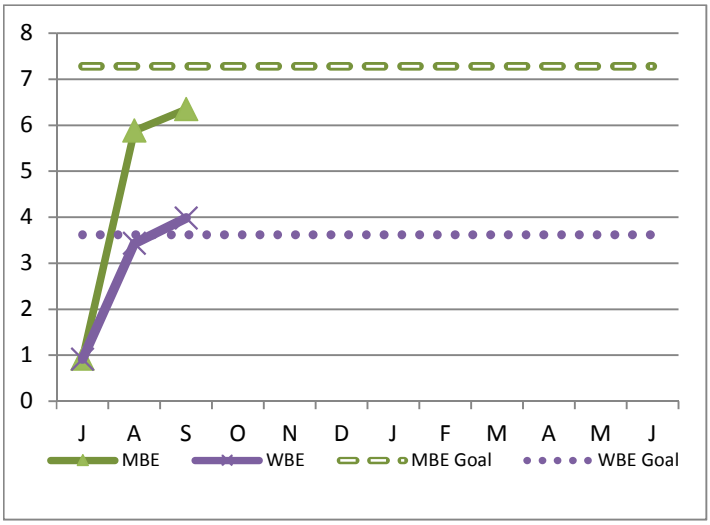
MBE/WBE Expenditures

1st Quarter - FY18

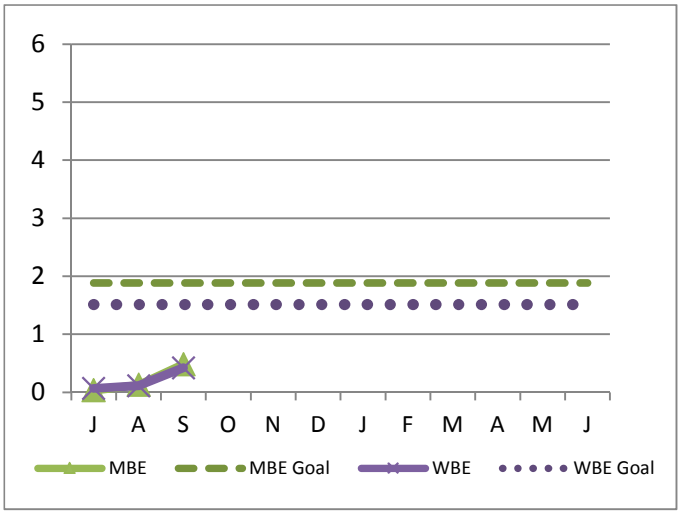
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY18 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they have no MBE/WBE spending goals.

MBE/WBE percentages are the results from a 2002 Availability Analysis, and MassDEP's Availability Analysis. As a result of the Availability Analyses, the category of Non-Professional Services is included in Goods/Services. Consistent with contractor reporting requirements, MBE/WBE expenditure data is available through September.

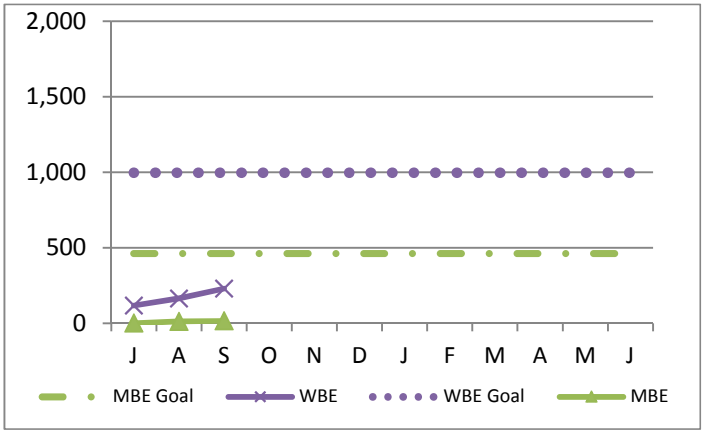
Construction



Professional Services



Goods/Services



FY17 spending and percentage of goals achieved, as well as FY16 performance are as follows:

MBE					WBE			
FY18 YTD		FY17			FY18 YTD		FY17	
Amount	Percent	Amount	Percent		Amount	Percent	Amount	Percent
6,344,419	87.2%	5,628,738	99.5%	Construction	3,986,079	110.1%	3,690,334	131.3%
484,660	25.7%	920,597	162.8%	Prof Svcs	424,071	28.0%	533,917	117.5%
15,625	3.4%	179,359	29.8%	Goods/Svcs	230,018	23.1%	1,553,214	181.6%
6,844,704	71.1%	6,728,694	98.6%	**Totals**	4,640,168	75.7%	5,777,465	140.2%

FY17 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

FY18 MBE/WBE dollar totals include F17 MBE/WBE dollars submitted in FY18.

MWRA - CEB Expenses

1st Quarter – FY18

	September 2017 Year-to-Date ($000)					
	Budget	Actual	Variance	%	FY18 Budget	%
EXPENSES						
WAGES AND SALARIES	$ 21,532	$ 21,894	$ 362	1.7%	$104,286	21.0%
OVERTIME	1,003	1,182	180	17.9%	4,111	28.8%
FRINGE BENEFITS	4,810	4,687	(124)	-2.6%	20,998	22.3%
WORKERS' COMPENSATION	581	218	(362)	-62.4%	2,323	9.4%
CHEMICALS	2,888	2,525	(362)	-12.6%	9,837	25.7%
ENERGY AND UTILITIES	4,622	4,575	(47)	-1.0%	21,735	21.1%
MAINTENANCE	6,542	6,488	(54)	-0.8%	32,201	20.1%
TRAINING AND MEETINGS	80	64	(17)	-20.9%	406	15.7%
PROFESSIONAL SERVICES	1,731	1,667	(64)	-3.7%	7,222	23.1%
OTHER MATERIALS	949	973	25	2.6%	6,693	14.5%
OTHER SERVICES	6,055	5,919	(136)	-2.2%	22,765	26.0%
TOTAL DIRECT EXPENSES	**$ 50,794**	**$ 50,194**	**$ (600)**	**-1.2%**	**$232,576**	**21.6%**
INSURANCE	$ 503	$ 415	$ (89)	-17.6%	$ 2,013	20.6%
WATERSHED/PILOT	6,291	6,005	(286)	-4.5%	25,164	23.9%
BECo PAYMENT	239	199	(40)	-16.9%	957	20.8%
MITIGATION	399	394	(6)	-1.4%	1,597	24.7%
ADDITIONS TO RESERVES	205	205	-	0.0%	821	25.0%
RETIREMENT FUND	3,277	3,277	-	0.0%	3,277	100.0%
POST EMPLOYEE BENEFITS	-	-	-	---	5,035	0.0%
TOTAL INDIRECT EXPENSES	**$ 10,916**	**$ 10,495**	**$ (420)**	**-3.9%**	**$ 38,866**	**27.0%**
STATE REVOLVING FUND	$ 20,159	$ 20,159	$ -	0.0%	$ 84,932	23.7%
SENIOR DEBT	65,265	65,265	-	0.0%	264,560	24.7%
CORD FUND	-	-	-	---	-	---
DEBT SERVICE ASSISTANCE	(392)	(392)	-	0.0%	(392)	100.0%
CURRENT REVENUE/CAPITAL	3,300	3,300	-	0.0%	13,200	25.0%
SUBORDINATE MWRA DEBT	20,767	20,767	-	0.0%	85,443	24.3%
LOCAL WATER PIPELINE CP	949	949	-	0.0%	3,795	25.0%
CAPITAL LEASE	804	804	-	0.0%	3,217	25.0%
DEBT PREYAYMENT	-	-	-	---	10,900	0.0%
VARIABLE DEBT	-	(2,042)	(2,042)	---	-	0.0%
HEEC CABLE CAPACITY RES	-	-	-	---	6,532	---
DEFEASANCE ACCOUNT	-	-	-	---	-	---
TOTAL DEBT SERVICE	**$110,853**	**$108,811**	**$ (2,042)**	**-1.8%**	**$472,188**	**23.0%**
TOTAL EXPENSES	**$172,562**	**$169,501**	**$ (3,062)**	**-1.8%**	**$743,630**	**22.8%**
REVENUE & INCOME						
RATE REVENUE	$179,264	$179,264	$ -	0.0%	$717,054	25.0%
OTHER USER CHARGES	2,420	2,409	(11)	-0.5%	9,011	26.7%
OTHER REVENUE	1,252	5,827	4,575	365.3%	7,359	79.2%
RATE STABILIZATION	-	-	-	---	-	---
INVESTMENT INCOME	2,266	2,511	245	10.8%	10,206	24.6%
TOTAL REVENUE & INCOME	**$185,201**	**$190,011**	**$ 4,809**	**2.6%**	**$743,630**	**25.6%**

As of September 2017, total expenses are $169.5 million, $3.1 million or 1.8% lower than budget, and total revenue is $190.0 million, $4.8 million or 2.6% over budget, for a net variance of $7.9 million.

Expenses –

Direct Expenses are $50.2 million, $600k or 1.2% below budget.

- **Chemicals** are underspent by $363k or 12.6% under budget due to lower flows at DI and CWTP and timing of deliveries: Sodium Hypochlorite by $152k due to lower flows at DI, Soda Ash by $144k reflecting lower flows and higher natural pH at CWTP, and Activated Carbon by $49k, partially offset by over spending of $158k for Hydrogen Peroxide again due to lower flows.
- **Worker's Compensation** expenses are $362k under budget or 62.4%, primarily due to timing of compensation reserves adjustments and lower medical payments.
- **Wages & Salaries** are over budget by $362k or 1.7%, regular pay was $386k over budget, primarily due to vacation and sick pay leave accrual. After netting out the leave accrual, Regular Pay was $642k under budget. At the end of September, the average Full Time Equivalent (FTE) positions were 1,148, two fewer than the 1,150 FTE's budgeted.
- **Other Services** expenses are $136k, or 2.2%, under budget primarily due to timing of payment of membership dues budgeted in the first quarter but not invoiced yet.
- **Overtime** expenses are $180k over budget or 17.9% due to recent wet weather events and off-hours maintenance.
- **Fringe Benefits** expenses are $124k, or 2.6%, under budget, primarily for lower Health Insurance costs of $78k due to fewer employees and retirees than budgeted participating in health insurance plans, and the shift from family to individual plans.

Indirect Expenses are $10.5 million, $420k under budget or 3.9%. Watershed reimbursement is $286k under budget due to a year-end over accrual, Insurance Claims/Premiums are under budget by $89k, and lower than budgeted HEEC O&M of $40k.

Debt Service Expenses totaled $108.9 million, $2.0 million under budget due to variable rate debt savings of $2.0 million reflecting lower than budgeted interest rates.

Revenue and Income –

Total Revenue / Income is $190.0 million, $4.8 million higher than budget, primarily due to a $4.2 million LIBOR settlement from Baclays Bank PLC. Revenues were also over budget by $245,000 for favorable returns on investment income, $228,000 for the final payment of a class action lawsuit settlement for derivative agreements, $100,000 for revenue attributable to renewable energy credits and energy rebates, and $66,000 for disposal of surplus material.

Cost of Debt
1st Quarter – FY18

MWRA borrowing costs are a function of the fixed and variable tax exempt interest rate environment, the level of MWRA's variable interest rate exposure and the perceived creditworthiness of MWRA. Each of these factors has contributed to decreased MWRA borrowing costs since 1990.

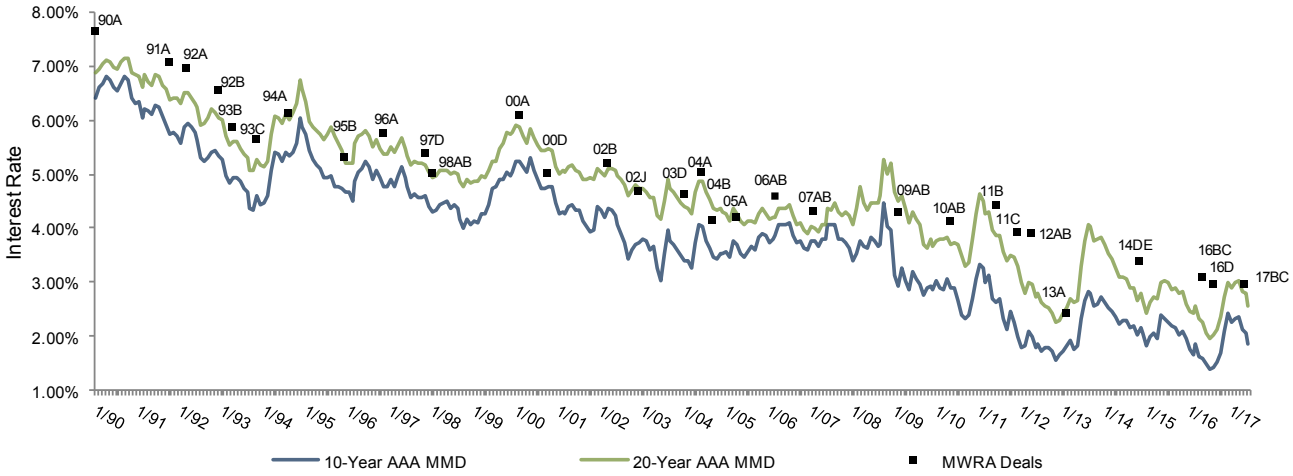
Average Cost of MWRA Debt FYTD

Fixed Debt ($3,511)	3.82%
Variable Debt ($470.9)	1.26%
SRF Debt ($951.0)	1.43%
Weighted Average Debt Cost ($5,093)	3.11%

Most Recent Senior Fixed Debt Issue
May 2017

2017 Series B &C ($322.9)	2.98%

MWRA Fixed Rate Debt vs. 10 and 20 Year MMD Rates

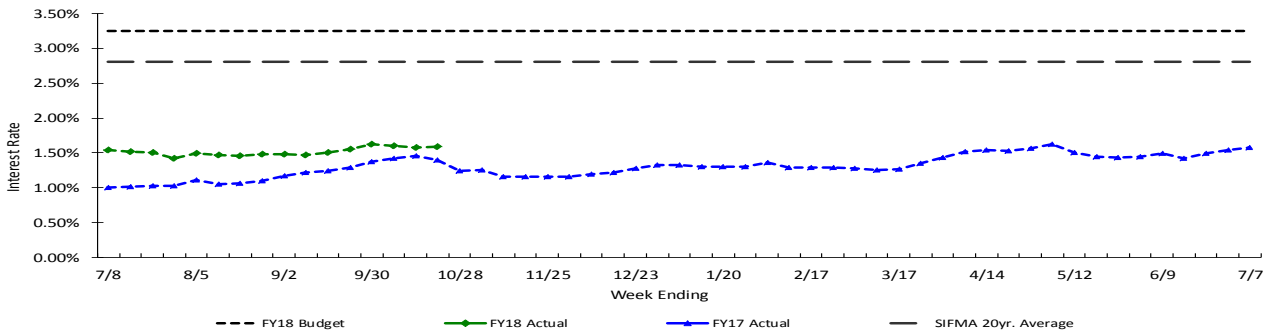


Bond Deal	1992B	1993B	1993C	1994A	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A
Rate	6.58%	5.89%	5.66%	6.15%	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%
Avg Life	6.3 yrs	19.8 yrs	19.1 yrs	19.5 yrs	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs

Bond Deal	2004B	2005A	2006AB	2007AB	2009AB	2010AB	2011B	2011C	2012AB	2013A	2014DEF	2016BC	2016D	2017BC
Rate	4.17%	4.22%	4.61%	4.34%	4.32%	4.14%	4.45%	3.95%	3.93%	2.45%	3.41%	3.12%	2.99%	2.98%
Avg Life	13.5 yrs	18.4 yrs	25.9 yrs	24.4 yrs	15.4 yrs	16.4 yrs	18.8 yrs	16.5 yrs	17.9 yrs	9.9 yrs	15.1 yrs	17.4 yrs	18.8yrs	11.2 yrs

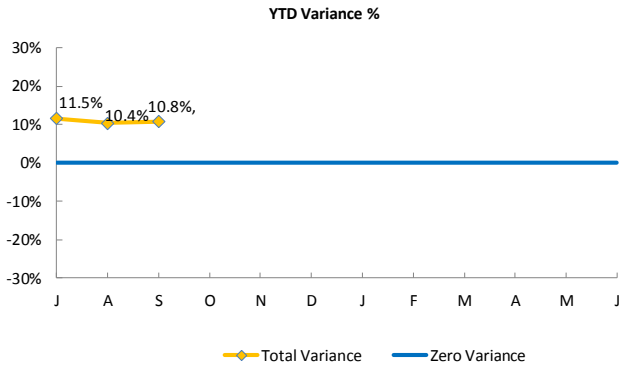
Weekly Average Variable Interest Rates vs. Budget

MWRA currently has ten variable rate debt issues with $835.2 million outstanding, excluding commercial paper. Of the ten outstanding series, five have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In September, SIFMA rates ranged from a high of 0.94% to a low of 0.78% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate risk as compared to fixed rate debt.

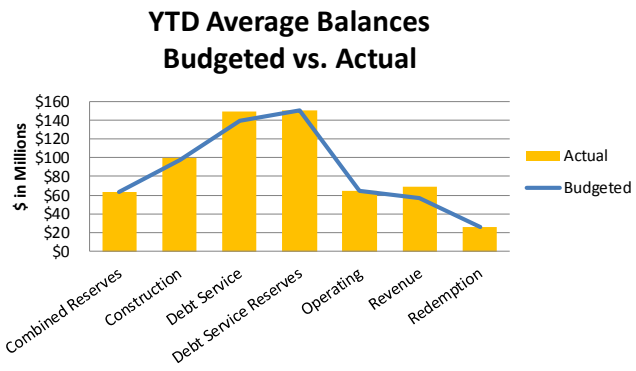


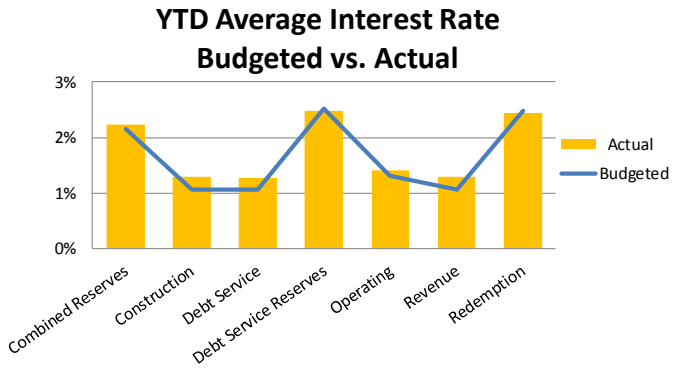
Investment Income
1st Quarter – FY18

Year To Date



	YTD BUDGET VARIANCE ($000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	($0)	$12	11	3.6%
Construction	$5	$54	59	24.7%
Debt Service	$24	$77	101	29.6%
Debt Service Reserves	($1)	($8)	(9)	-1.1%
Operating	($0)	$15	15	7.5%
Revenue	$31	$39	70	50.6%
Redemption	$0	($1)	(1)	-1.0%
Total Variance	$58	$187	$245	10.8%





Monthly