MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

for

Third Quarter FY2018

Q1	Q2	Q3	Q4
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Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
May 30, 2018

Board of Directors Report on Key Indicators of MWRA Performance

3rd 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.

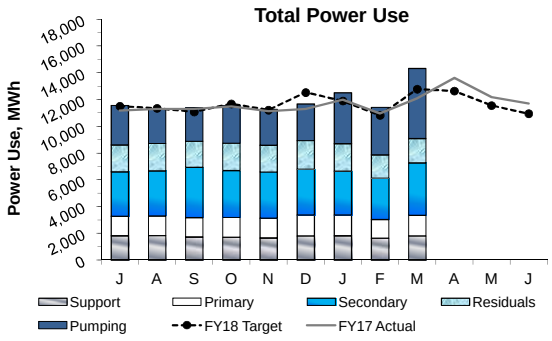
Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer

May 30, 2018

OPERATIONS AND MAINTENANCE

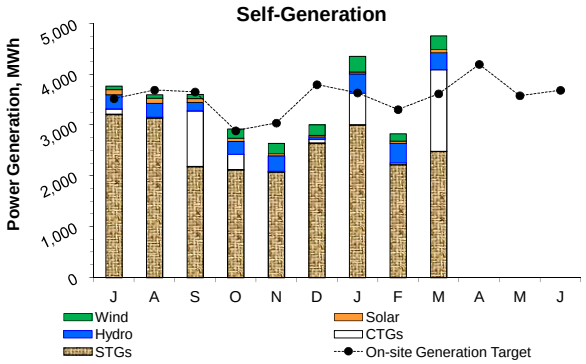
Deer Island Operations

3rd Quarter - FY18

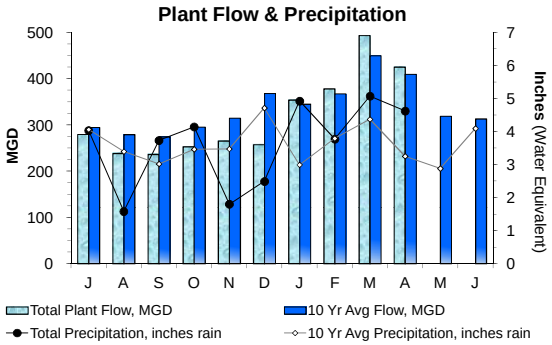


Total power usage in the 3rd Quarter was 7.8% above target as Total Plant Flow was 17.8% above target with the 3 year average plant flow. While power used in most areas of the plant were similar to target, power used for wastewater pumping was 17.3% higher than expected due to the higher plant flow and was13.4% higher for secondary treatment due to a greater oxygen demand in the secondary aeration process, also as a result of the higher plant flow.

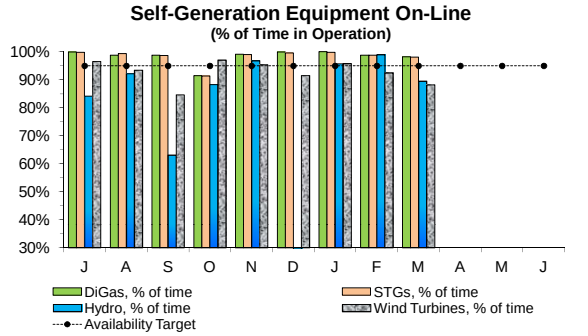
Note: Power usage projections are based on 3 year averages.



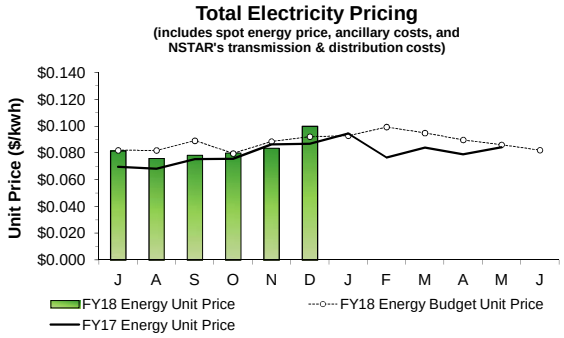
Power generated on-site during the 3rd Quarter was 13.1% above target. Power generation by the CTGs, STGs, Wind Turbines, and Solar Panels all met or exceeded their generation target. The CTGs were operated during six (6) storm events in the 3rd Quarter, as well as following a plant-wide power loss, in addition to operating for routine maintenance and checkout purposes. Power generated from CTG operation was more than three times the target. Generation by the Hydro Turbines was 32% below target as Hydro Turbine #1 remains out of service pending repair of the rotating assembly.



Total Plant Flow for the 3rd Quarter was 5.5% above target with the 10 year average plant flow (408.5 MGD actual vs. 387.3 MGD expected) as precipitation for the quarter was 23.4% higher than target (13.76 inches actual vs. 11.15 inches expected).

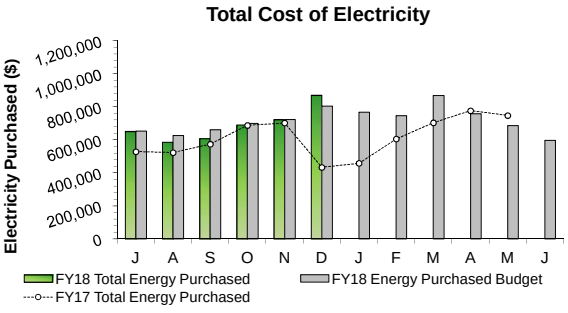


The DiGas system, STGs, and Hydro Turbines met or exceeded the 95% availability target for the 3rd Quarter. Hydro Turbine availability in March fell below target due in part to high plant flow events causing the turbine to trip offline and a sudden plant-wide power outage on March 14 which generated alarm conditions that prevented the turbine from restarting until the next day. Wind Turbine availability fell below target due to routine preventative maintenance this quarter, excessive and turbulent winds during a number of nor'easter storms, as well as issues that were also caused by the power outage.



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 prices in January, February, and March (Quarter 3) are not yet available as the complete invoices have not been received. The actual Total Energy Unit Price in the 2nd Quarter, through December (the most current invoice available) was 2.7% below target with budgetary estimates. 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 three (3) months due to the timing of invoice receipt and review.

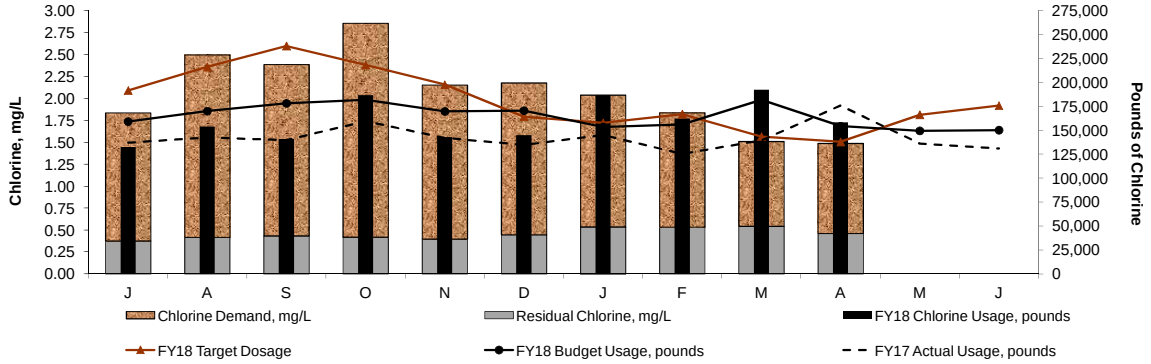


The invoices for the total cost of Electricity Purchased for January, February, and March (Quarter 3) have not been received as of reporting time. Year-to-date Total Cost of Electricity is $39,704 (1.0%) lower than budgeted through December as the Total Energy Unit Price is lower than budgeted by 2.7%, while the Total Electricity Purchased is 1.5% higher than target through December.

Note: Only the actual energy prices are reported. Therefore, the dataset lags by three (3) months due to the timing of invoice receipt and review.

Deer Island Sodium Hypochlorite Use

Disinfection Dosage and



The disinfection dosing rate in the 3rd Quarter was 5.4% above the target. DITP maintained an average disinfection chlorine residual of 0.54 mg/L this quarter with an average dosing rate of 1.79 mg/L (as chlorine demand was 1.26 mg/L). Actual sodium hypochlorite usage in pounds of chlorine was 10.1% above target this quarter as the overall plant flow was 17.8% higher than target and included several heavy rain events in combination with significant snow melt.

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	1	1	0	98.4%	12.30
N	0	0	0	100.0%	0.00
D	0	0	0	100.0%	0.00
J	2	2	0	97.8%	27.94
F	0	0	0	100.0%	0.00
M	3	2	1	97.8%	38.98
A					
M					
J					
Total	9	8	1	99.1%	88.10

98.5% of all flows were treated at full secondary during the 3rd Quarter. There were four (4) secondary blending events due to high plant flow resulting from heavy rain combined with melting snow. These blending events resulted in a total of 66.41 hours of blending and 564.24 MGal of primary-only treated effluent with secondary effluent. A fifth secondary blending/bypass event lasting 0.52 hours occurred on March 14. This event followed an unanticipated plant-wide power outage and subsequent communications failure on the centralized process information and control system ("PICS") resulting in 9.74 MGal of primary-only treated effluent bypassing the secondary treatment process. Of the 9.74 MGal, 6.15 MGal was blended with secondary effluent, and an estimated 3.59 MGal was discharged without blending. All effluent was fully disinfected and then dechlorinated. The average daily flow was 550.2 MGD on March 14. Therefore, 1.12% is estimated to have been blended with effluent that received secondary treatment and 0.65% of the flow was discharged without blending during the event. The Maximum Secondary Capacity for the entire quarter was 700 MGD.

Secondary permit limits were met at all times during the 3rd Quarter.

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved an instantaneous peak flow rate of 1,202.9 MGD during the morning of January 13. This peak flow occurred during a rain event that produced a total of 1.86 inches of precipitation combined with significant snow melt. Overall, Total Plant Flow in the 3rd Quarter was 5.5% higher than target with the 10 year average plant flow target for the quarter.

A number of significant storm events occurred during the 3rd Quarter, including a powerful nor'easter storm system that hit Massachusetts and the entire northeast coast in the form of a historic blizzard a few days into the new calendar year, a storm that surpassed the meteorological criteria to be considered a "bomb cyclone" due to the rapid nature of the barometric pressure drop. This blizzard dropped a total of 13.4 inches of snow on Boston on January 4, but also brought along high winds and frigid temperatures. The resulting surge produced by the storm was the highest tide ever recorded for Boston when the tide reached 15.16 feet, breaking the previous record of 15.1 feet measured during the Blizzard of 1978. Significant flooding was observed in many areas along the coast including in Winthrop. Nevertheless, pumping and treatment processes continued without incident during and following the storm. The CTGs were operated in parallel with utility power for a combined total of 22.17 hours during the height of the storm from noon on January 4 to the morning of January 5 as a precautionary measure.

Deer Island Operations & Maintenance Report (continued)

Environmental/Pumping (continued):
Mild and record high temperatures with on target precipitation occured in February, to be replaced with a stormy pattern in March. The plant achieved the second highest instantaneous peak flow rate in the quarter of 1,183.4 MGD during the afternoon of March 2. This peak flow occurred during a nor'easter rain event that produced a single day total precipitation of 2.30 inches and a daily average plant flow of 950.4 MGD. This storm system also caused significant coastal flooding and damage along the mid-Atlantic and Northeastern coastline as a result of unusually high tides and storm surges. Additionally, damage from the high winds, including hurricane-force winds in New England, produced a high of nearly two (2) million power outages at one point. There were four (4) separate nor'easter storm events in March occurring on March 2, March 7, March 13, and on March 22. These nor'easter storm events brought both rain and/or snow, along with high winds, to the region, including 14.5 inches of snow during a blizzard on March 13, setting a new Boston record for one-day snowfall in the month of March.

On January 8, Deer Island electrical contractors completed testing on breakers, cables, and electrical instrumentation on raw wastewater pumps 1, 2, 3, 4, 5, and 6 at the North Main Pump Station (NMPS) as part of regular preventative maintenance. The testing verified that all electrical systems were in working order.

Work on the Winthrop Terminal VFD (Variable Frequency Drive) and Synchronous Motor Replacement project was started by the contractor in January and will entail demolition of existing older obsolete equipment (electrical systems, motors and VFDs on each of the six (6) raw wastewater pumps). Demolition and installation of new equipment is expected to take approximately two (2) months followed by three (3) months of performance testing. The pumps are currently powered by 600 volts service and will be changed to 4,160 volts, consistent with other major pumps in both the South System Pump Station (SSPS) and the North Main Pump Station (NMPS). Construction activities on pump 6 were in process during the quarter.

Odor Control:
Activated carbon in carbon adsorber (CAD) unit #1 in the North Pumping Odor Control (NPOC) Facility, unit #8 in the West Odor Control (WOC) Facility, and unit #4 in the Residuals Odor Control (ROC) Facility was changed out in February as part of routine practice to replace spent carbon.

Energy and Thermal Power Plant:
Overall, total power generated on-site accounted for 31.2% of Deer Island's total power use for the quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 25.3% of Deer Island's total electrical power use for the quarter.

Opacity testing for each CTG unit was successfully completed on January 31 as part of the annual regulatory requirements for emissions reporting on the CTGs and the results of this test demonstrated the units were in compliance. The test requires each CTG to be operated (one at a time) at full load for one (1) hour. During this time a certified "smoke reader" visually observes the condition of the stack exhaust and records the results.

On March 14 at 8:37 am, while recovering from a major nor'easter blizzard that hit the area on March 13, Deer Island experienced an unanticipated complete loss of power as a result of an Eversource regional power outage caused by an electrical fault originating in Andrew Square, South Boston. Backup power to Deer Island was immediately restored by placing both CTG units into operation which allowed raw wastewater pumping to resume by 9:00 am. Five (5) pumps were in operation in the South System Pump Station by 9:28 am. Other plant processes and equipment, including Thermal Power Plant boiler operation, were restored sequentially through the day and into the evening. A secondary blending/bypass event lasting 0.52 hours occurred at 11:07 am while in recovery mode from the power outage, and shortly after also recovering from a communications failure on the centralized process information and control system ("PICS"). Refer to the Secondary Blending graph and comment for details of this secondary blending/bypass event. DITP maintained compliance with its NPDES permit effluent limits at all times. Moreover, no sanitary sewer overflows ("SSOs") or combined sewer overflows ("CSOs") occurred as a result of the loss of power and dead restart of DITP.

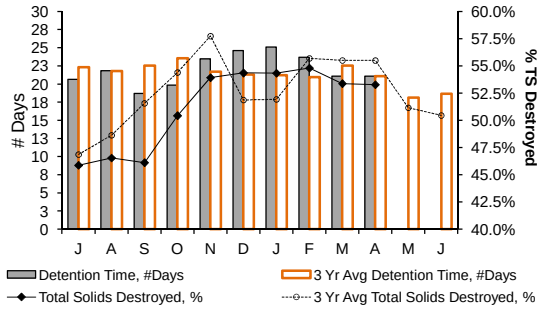
Clinton AWWTP:
Phosphorus Reduction Facility: Work completed or in progress during 3rd Quarter:
Contractor has begun performance testing of the phosphorus removal disc filters. Awning over the main entryway, installed. The 350 KW Backup Generator for the Chemical Building was removed. The boilers in the Headworks and Dewatering building have both been converted from oil to gas burners.

Installed new day tank for 450KW Backup Generator.
Replaced #1 & #3 Primary Sludge Pumps.

Deer Island Operations and Residuals

3rd Quarter - FY18

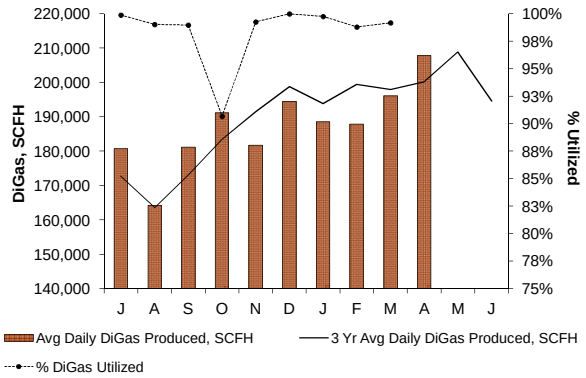
Sludge Detention Time in Digesters and Total Solids Destruction



Total solids (TS) destruction following anaerobic sludge digestion averaged 54.2% during the 3rd Quarter, on target with the 3 year average of 54.4% for the same period, as the sludge detention time in the digesters was 23.3 days. DI operated with an average of 8.0 digesters during the 3rd Quarter, on target with the 3 year average of 8.0 digesters.

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.

Digester Gas Production and % Utilized

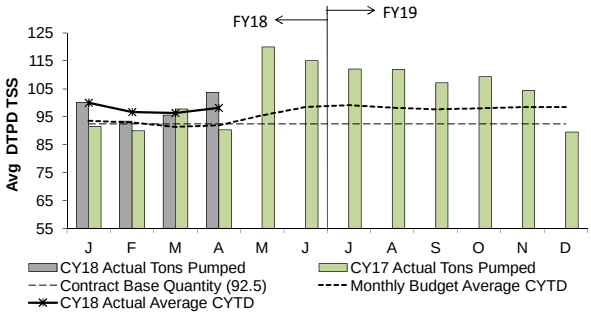


The Avg Daily DiGas Production in the 3rd Quarter was 3.2% below target with the 3 Year Avg Daily DiGas Production. On average, 99.2% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant.

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 (FY18's budget is 99.5 DTPD/TSS and FY19's budget is 98.9 DTPD/TSS).

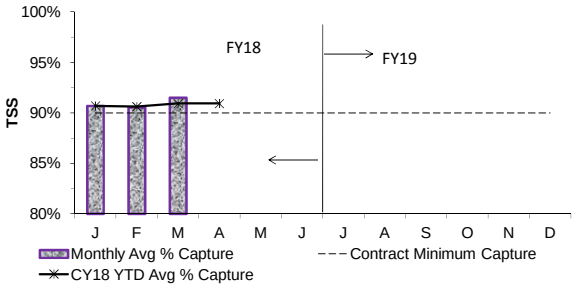
Sludge Pumped From Deer Island



The average quantity of sludge pumped to the FRSA Pellet Plant in the 3rd Quarter of FY18 was 96.4 DTPD - above target with the FY18 budget of 91.3 DTPD for the same period. Sludge delivered to FRSA was higher than expected due to higher than expected total sludge production as a result of higher than expected primary sludge and secondary waste sludge for the quarter.

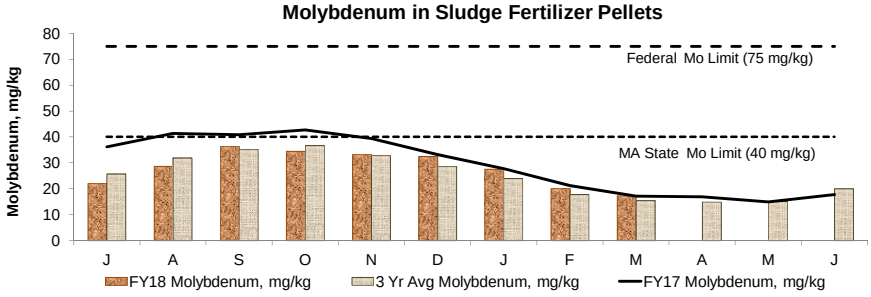
The CY18 average quantity of sludge pumped through March is 96.4 DTPD - 5.5% above target, compared with the CY18 average budget of 91.3 DTPD for the same time period.

Monthly Average % Capture of Processed Sludge



The contract requires NEFCo to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility in Quincy. The CY18 average capture is 90.92%.

Molybdenum in Sludge Fertilizer Pellets



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

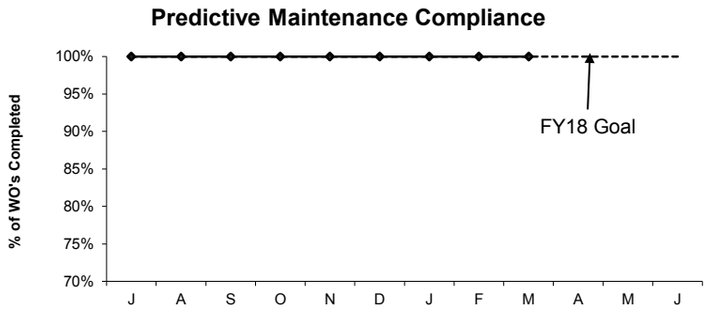
The levels have been below the DEP Type 1 limit for all three metals. For Mo, levels in the Fore River sludge fertilizer pellets during the 3rd Quarter of FY18 averaged 21.7 mg/kg, 14% higher than the 3 year average, but 46% below the MA State Limit, and 71% below the Federal Limit.

Deer Island Maintenance

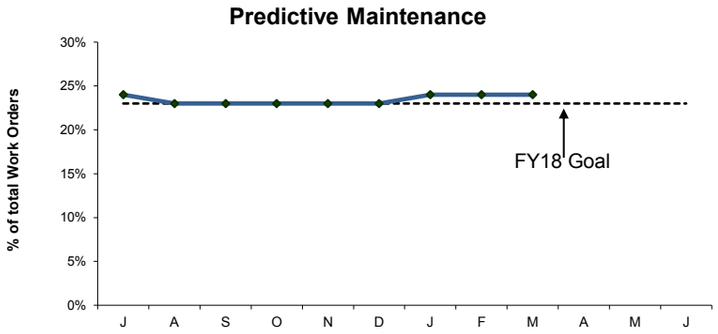
3rd Quarter - FY18

Productivity Initiatives

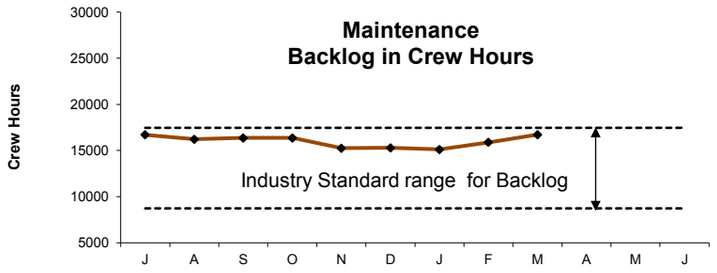
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.



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.



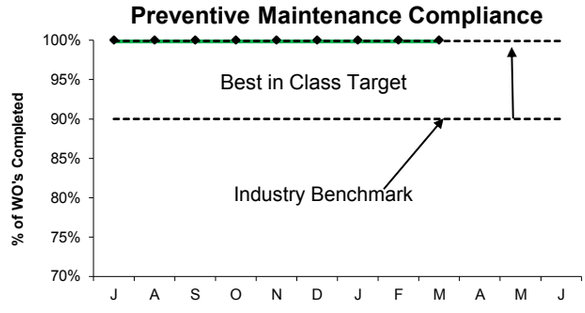
Deer Island's FY18 predictive maintenance goal is 23% of all work orders to be predictive. 24% of all work orders were predictive maintenance this quarter. The industry is moving toward increasing predictive maintenance work to reduce downtime and better predict when repairs are needed.



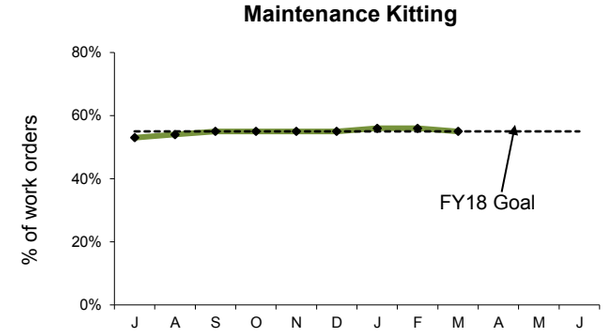
DITP's maintenance backlog at Deer Island is 16,762 hours this quarter. DITP is within the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by three vacancies; two M&O Specialists and one Electrician. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

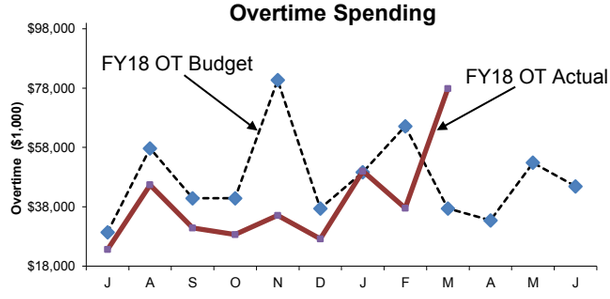
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.



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. 55% 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.



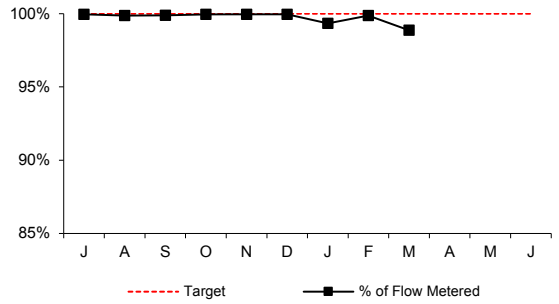
Maintenance overtime was over budget by $14K this quarter and $86k under for the year. Management continues to monitor backlog and to ensure all critical equipment and systems are available. This quarters overtime was predominately used for Three Nor'easter Storms, Isolating/Cleaning/Inspecting Gravity Thickeners #5 and #6, Rebuilding of Scum Hopper #1, HVAC Heating Issues due to Extreme Cold and Thermal Power Plant Boiler Start-Up,

Operations Division Metering & Reliability

3rd Quarter - FY18

WATER METERS

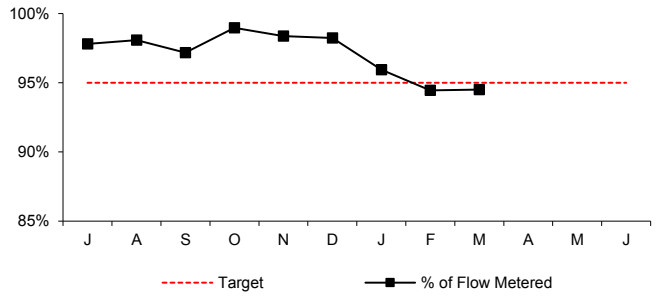
Percent of Total Revenue Water Deliveries Calculated Using Meters



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 3rd quarter of FY18, meter actuals accounted for 99.36% of flow; only 0.64% of total revenue water deliveries were estimated. The following is the breakdown of reasons for estimations:
In-house and Capital Construction Projects - 0.32%
Instrumentation Failure - 0.32%

WASTEWATER METERS

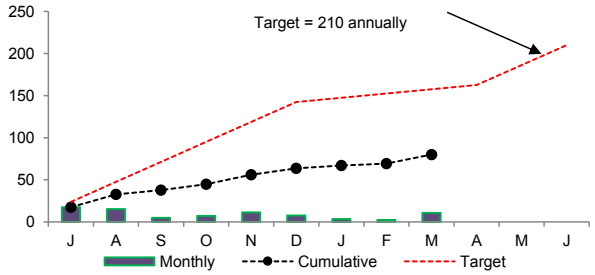
Percent of Total Wastewater Transport Calculated Using Meters



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 3rd quarter of FY18, meter actuals accounted for 94.96% of flow; only 5.04% of wastewater transport was estimated.

WATER DISTRIBUTION SYSTEM PIPELINES

Miles Surveyed for Leaks



During the 3rd Quarter, 16.4 miles of water mains were inspected. The total inspected for the fiscal year to date is 80.03 miles.

Leak Backlog Summary

Month	J	A	S	O	N	D	J	F	M	A	M	J	Totals
Leaks Detected	4	2	4	6	5	2	1	0	3				27
Leaks Repaired	2	1	3	7	2	3	2	1	2				23
Backlog	8	9	10	9	12	11	10	9	10				88

During the 3rd Quarter, four new leaks were detected. Five leaks were repaired in the 3rdQ; refer to FY18 Leak Report below for details. Also, community service ranging from individual leak location to hydrant surveys were conducted for: Arlington, Chelsea, Chicopee, Lexington, Lynn, Medford, Milton, Revere, Somerville, Stoneham, Wakefield, Weston and Woburn.

FY18 Leak Report as of 3rd Quarter

Date Detecte	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
08/13/17	River Road @ Loring Rd, Weston. WASM-4	10/20/17
09/24/17	#215 Common Street, Watertown	10/02/17
09/26/17	#1 Bellevue Street, Waltham	10/10/17
10/16/17	Lynnway (SouthBound) @ Sheppard St.	10/27/17
10/18/17	Hyde Park Ave. @ Hyde Park Pump Station	10/18/17
10/22/17	Vose Ave., Hyde Park	10/22/17
10/23/17	Riverside Ave. @Hall Street - Medford	10/23/17
10/19/17	1062 Hyde Park Ave., Hyde Park, Boston	11/13/17
10/31/17	Revere Beach Pkwy @ Suffolk Downs	11/08/17
11/20/17	Off Ramp 128 Mass Pike-Weston.	12/18/17
11/27/17	#93 Worcester St. Sec-80, Wellesley.	12/13/17
12/29/17	Chelsea Creek Headworks. Chelsea	12/29/17
12/12/17	#352 Norfolk St. Cambridge.	01/23/18
01/09/18	Madison @ Main Street, Malden	01/22/18
07/26/16	Reservoir Playground, Cleveland Circle	02/28/18
03/20/18	Frontage Rd. @Veneer St, Arlington (main break)	03/21/18
03/28/17	50 Sherman St., Sec-85 Revere	03/30/18

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 of valve, not surfacing. Need redundant NIH pipeline to enable isolation.
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.
11/02/17	Frontage Rd. @ Veneer St., Arlington. Leaking blowoff valve; not surfacing.
11/20/17	Peabody St., @ Washington St., Newton. Air Valve leak, not surfacing.
11/26/17	Nonantum Rd. @ Maple St., Newton. Air valve leak, not surfacing.
3/25/18	Second St. @ Market St, Everett (main leak-night work)

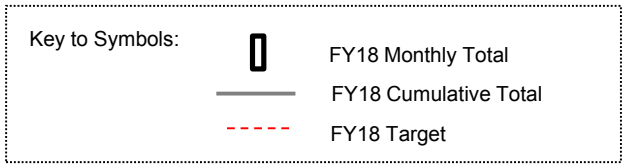
Water Distribution System Valves

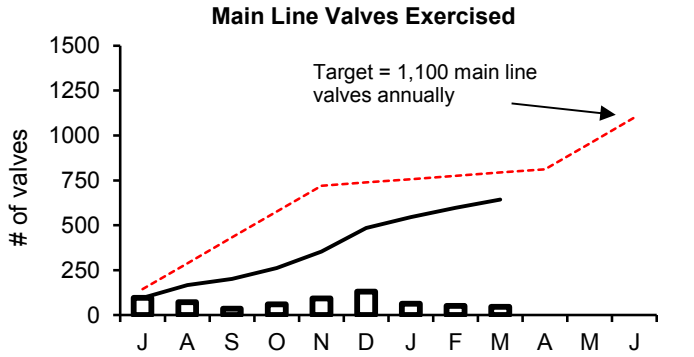
3rd Quarter - FY18

Background

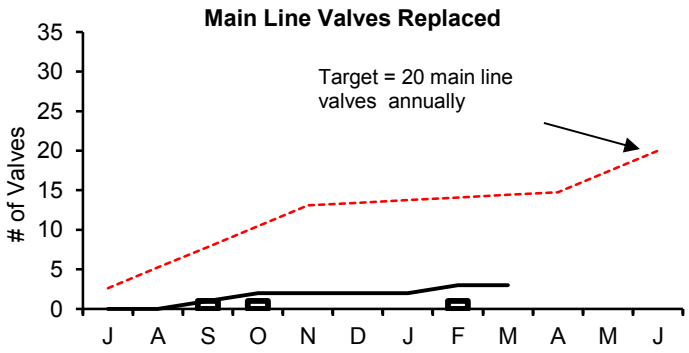
Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but 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	96.5%	95%
Blow-Off Valves	1,317	97.9%	95%
Air Release Valves	1,380	94.8%	95%
Control Valves	49	100.0%	95%

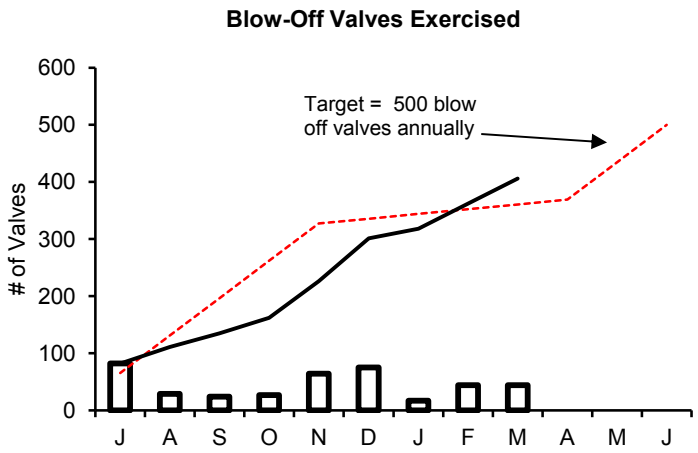




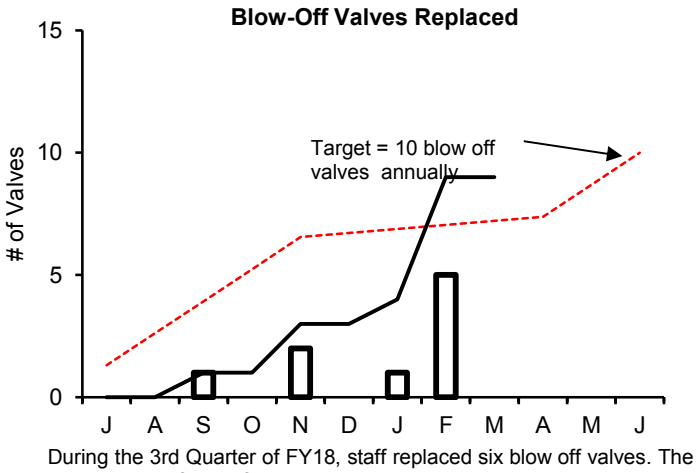
During the 3rd Quarter of FY18, staff exercised 159 main line valves. The total exercised for the fiscal year is 643.



During the 3rd Quarter of FY18, staff replaced one main line valve. The total replaced for the fiscal year is three. Below target due to other projects such as Watertown Pipeline coupling and leak repairs taking priority.



During the 3rd Quarter of FY18, staff exercised 105 blow off valves. The total exercised for the fiscal year is 406.



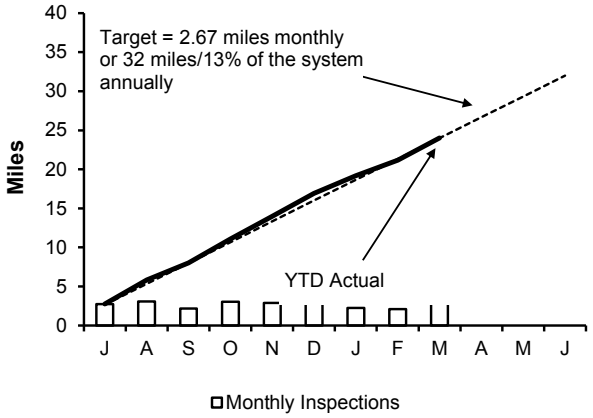
During the 3rd Quarter of FY18, staff replaced six blow off valves. The total replaced for the fiscal year is nine.

Wastewater Pipeline and Structure Inspections and Maintenance

ONB 3rd Quarter - FY18

Inspections

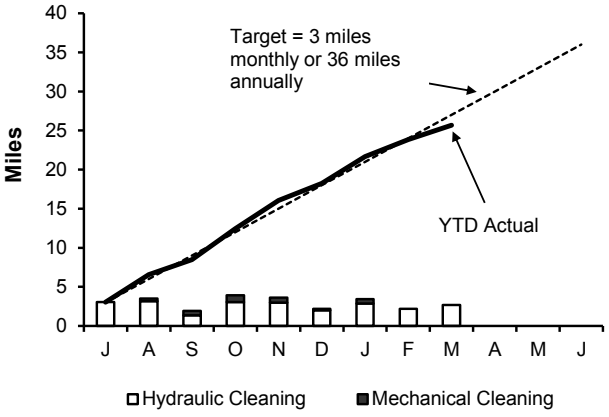
Pipeline Inspections



Staff internally inspected 7.19 miles of MWRA sewer pipeline during this quarter. The year to date total is 24.02 miles. No Community Assistance was provided quarter.

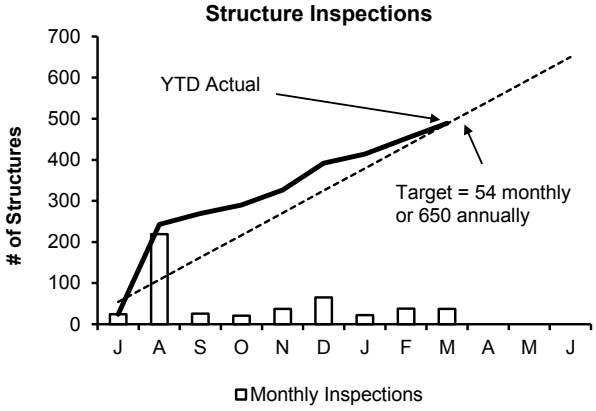
Maintenance

Pipeline Cleaning



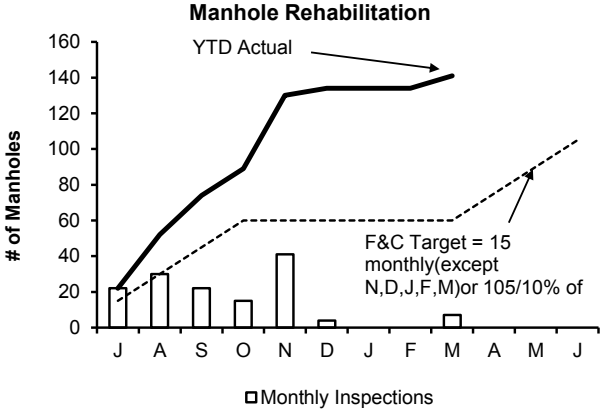
Staff cleaned 8.30 miles of MWRA's sewer system and removed 34 yards of grit and debris during this quarter. The year to date total is 26.53 miles. No Community Assistance was provided this quarter.

Structure Inspections



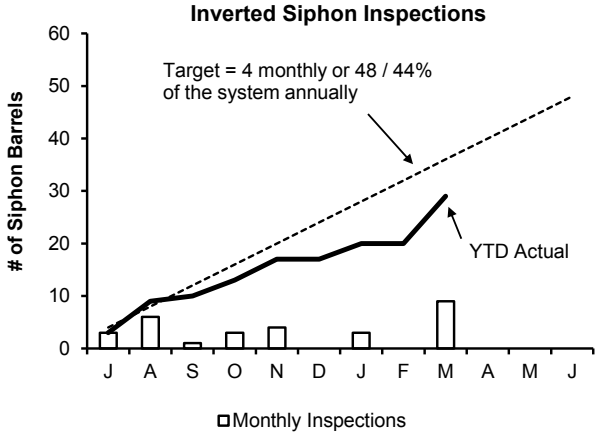
Staff inspected the 36 CSO structures and performed 61 additional manhole/structure inspections during this quarter. The year to date total is 489 inspections.

Manhole Rehabilitation



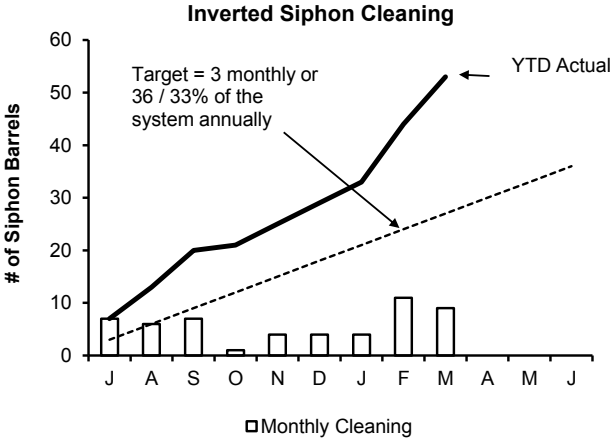
Staff replaced 7 frames & cover during this quarter.The year to date total is 141.

Inverted Siphon Inspections



Staff inspected 12 siphon barrels this quarter. Year to date total is 29 inspections.

Inverted Siphon Cleaning

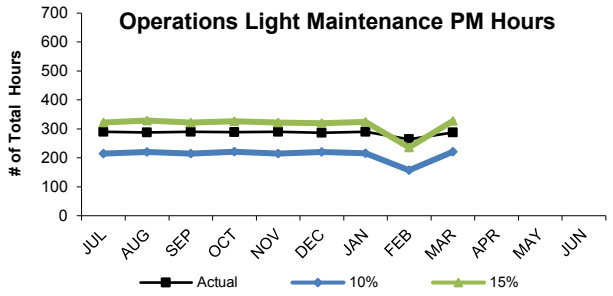


Staff cleaned 9 siphon barrels during this quarter. Year to date total is 53.

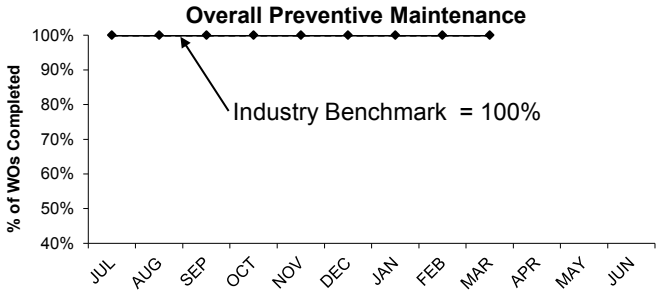
Field Operations' Metropolitan Equipment & Facility Maintenance

3rd Quarter - FY18

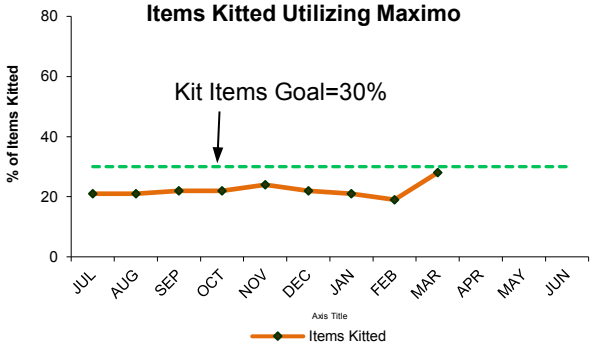
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



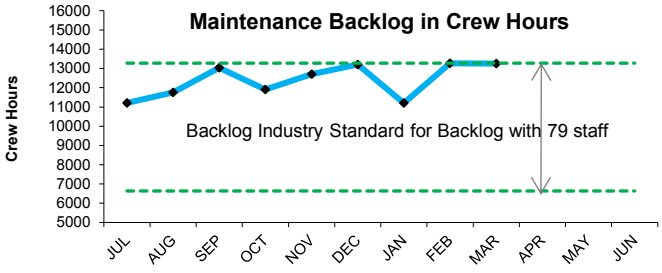
Operations staff averaged 281 hours of preventive maintenance during the 3rd Quarter, an average of 15% of the total PM hours for the 3rd Quarter, which is within the industry benchmark of 10% to 15%.



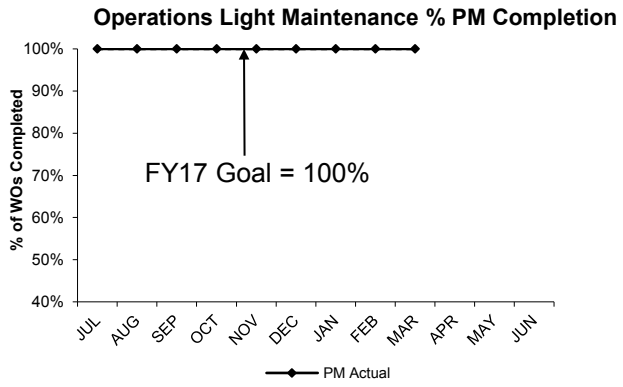
The Field Operations Department (FOD) preventive maintenance goal for FY18 is 100% of all PM work orders. Staff completed an average of 100% of all PM work orders in the 3rd Quarter.



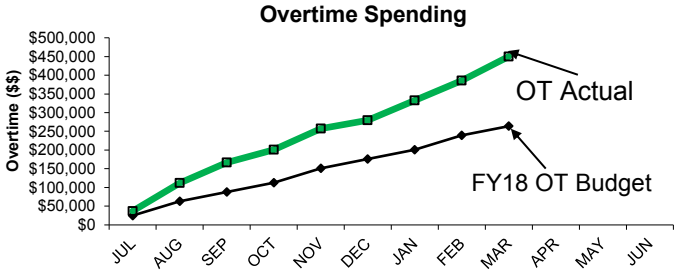
Operation's FY18 maintenance kitting goal has been set at 30% of all work orders to be kitted. Kitting is the staging of parts or material neccesary to complete maintenance work. In the 3rd Quarter, 23% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



The 3rd Quarter backlog average is 12572 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6450 to 12,940 hours.



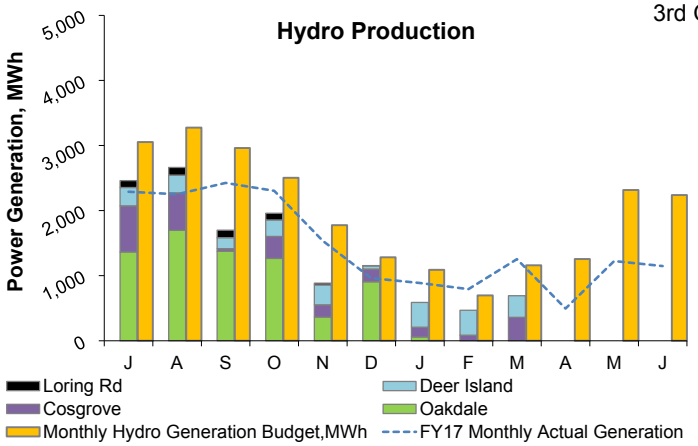
Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY18 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 3rd Quarter.



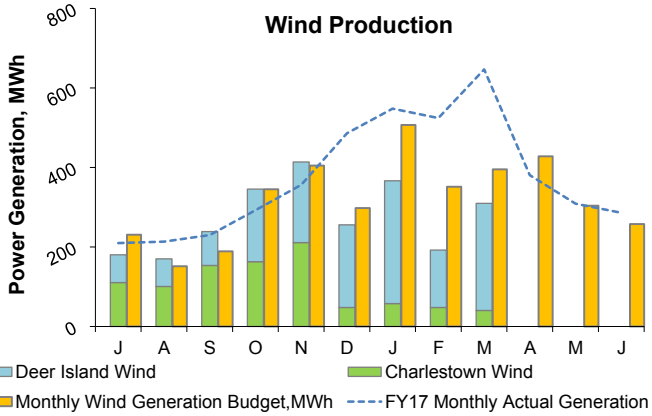
Maintenance overtime was $84k over budget for the 3rd Quarter. Overtime was used for critical maintenance repairs. Overtime for FY18 is $450k which is currently 186k over budget for the fiscal year.

Renewable Electricity Generation: Savings and Revenue

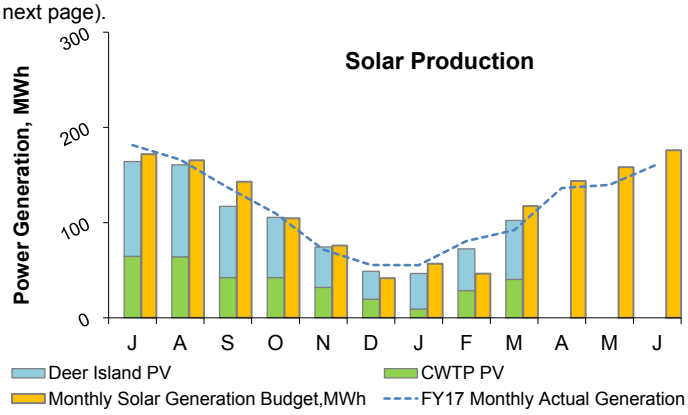
3rd Quarter - FY18



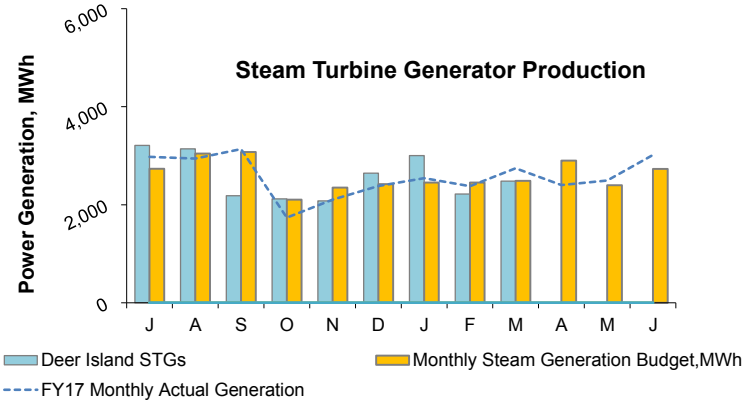
In the third Quarter, the renewable energy produced from all hydro turbines totaled 1,752 MWh; 41% below budget[3]. The total energy produced to date in FY18 is 12,575 MWh; 29% below budget[3]. This is due to the Cosgrove generation values being highly underestimated by the utility company, and limited Quabbin transfers through Oakdale. The utility data for Cosgrove is typically corrected and reconciled in later months of the year. Cosgrove data for Q3 has been estimated due to MWRA not receiving statements from the utility in time of reporting. The total savings and revenue[2] to date in FY18 (actuals through December[1]) is $416,413; 42% below budget[3], due to the reasons stated above. The savings and revenue value does not include RPS REC revenue (see next page).



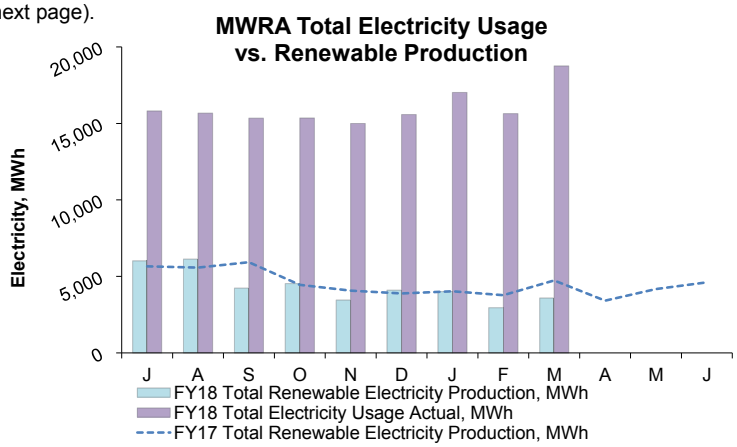
In the third Quarter, the renewable energy produced from all wind turbines totaled 868 MWh; 31% below budget[3]; moslty due to Charlestown Wind turbine undergoing repairs. The total energy produced to date in FY18 is 2,473 MWh; 14% below budget[3]. The total savings and revenue[2] to date in FY18 (actuals through December[1]) is $232,048; 2% above budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

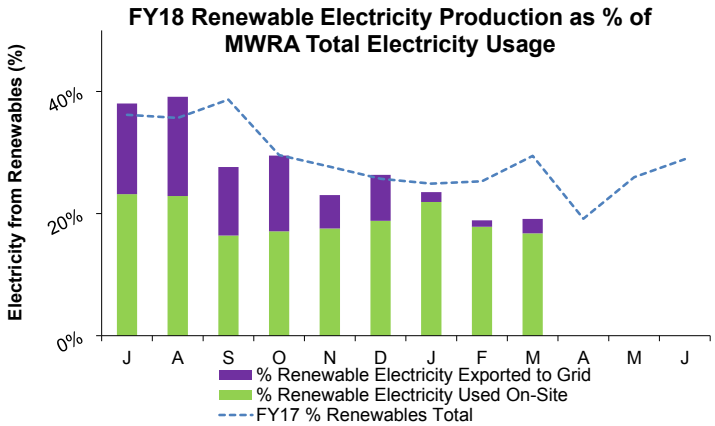


In the third Quarter, the renewable energy produced from all solar PV systems totaled 221 MWh; equal to budget[3]. The total energy produced to date in FY18 is 892 MWh; 3% below budget[3]. The total savings and revenue[2] to date in FY18 (actuals through December[1]) is $80,598; 5% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



In the third Quarter, the renewable energy produced from all steam turbine generators totaled 7,704 MWh; 4% above budget[3]. The total energy produced to date in FY18 is 23,078 MWh; equal to budget[3].
The total savings and revenue[2] to date in FY18 (actuals through December[1]) is $1,277,511; 5% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



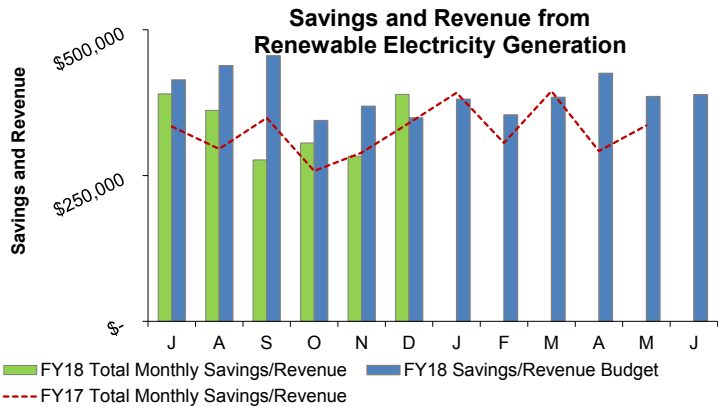


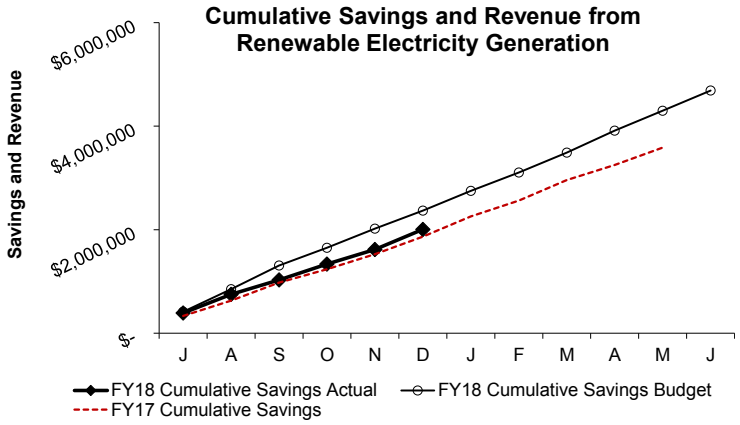
In the first three Quarters of FY18, MWRA's electricity generation by renewable resources totaled 39,019 MWh. Cosgrove hydro generation data was underestimated by the utility and will be reconciled in later months; this will be reflected in future reporting. MWRA's total electricity usage was approximately 144,196 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 9 months of FY18, green power generation represented approximately 27% of total electricity usage. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.

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

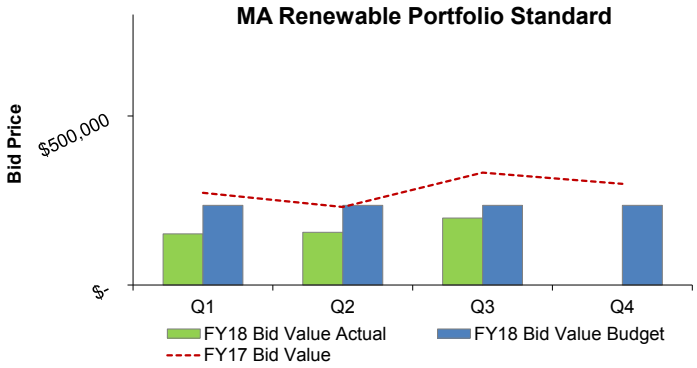
Renewable Electricity Generation: Savings and Revenue

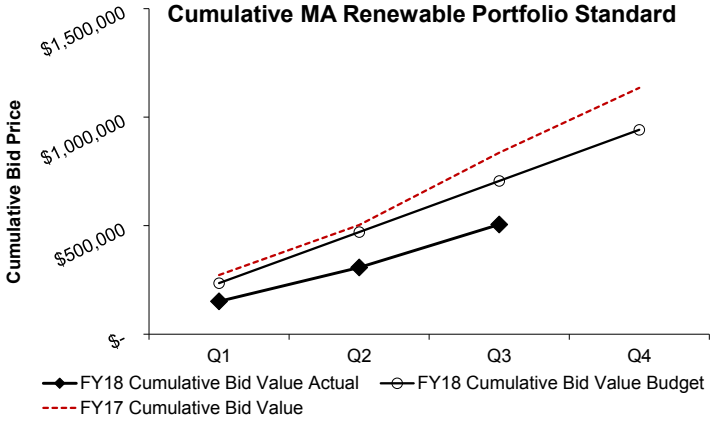
3rd Quarter - FY18





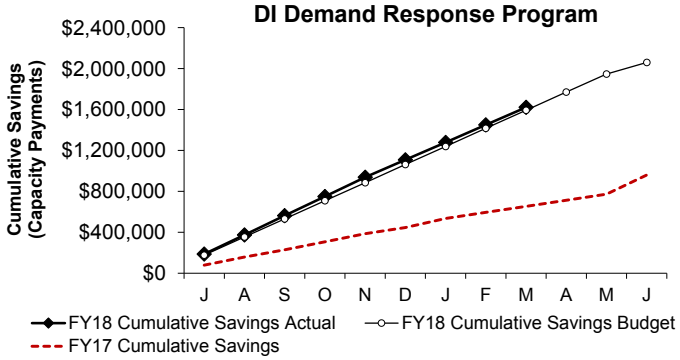
Savings and revenue from MWRA renewable electricity generation in the first half of FY18 (actuals only through December[1]) is $2,006,570; which is 15% below the budget[3], partly due to the Cosgrove hydro generation values being underestimated by the utility (this will be reconciled in later months and will be reflected in future reporting), and the DI STGs being off-line or at reduced operation for annual maintenance in September.
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).

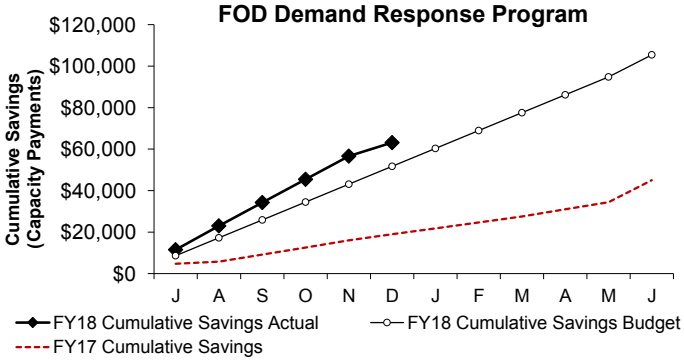




Bids were awarded during the 3rd Quarter[1] from MWRA's Class 1, Class 2, and Solar REC renewable energy assets; 7,360 Q3 CY2017 Class I Renewable Energy Certificates (RECs), 4,401 Class II Q3 2017 RECS, and 96 Q3 CY2017 Solar RECs (SRECs) were sold for a total value of $198,251 RPS revenue; which is 36% below budget[3] for the Quarter. This is mainly due to Class I market prices being 69% below budget for the Quarter.

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



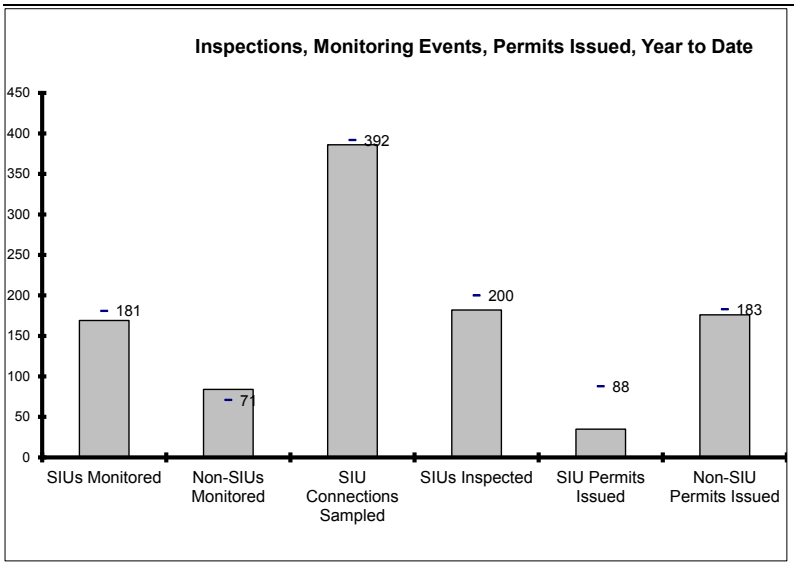


Currently Deer Island, JCWTP, and Loring Rd participate in the ISO-New England Demand Response Programs[4]. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from 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 March[1] total $1,620,875 for DI and $63,151 for FOD through December[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

3rd Quarter - FY18



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.

EPA Required SIU Monitoring Events
for FY18: 181
YTD : **169**

Required Non-SIU Monitoring Events
for FY18: 71
YTD : **84**

SIU Connections to be Sampled
For FY18: 392
YTD: **386**

EPA Required SIU Inspections
for FY18: 200
YTD: **182**

SIU Permits due to Expire
In FY18: 88
YTD: **35**

Non-SIU Permits due to Expire
for FY18: 183
YTD: **176**

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.

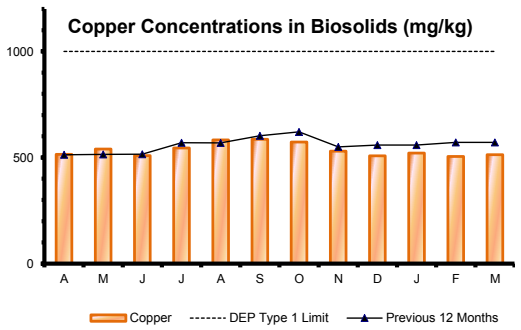
Number of Days to Issue a Permit

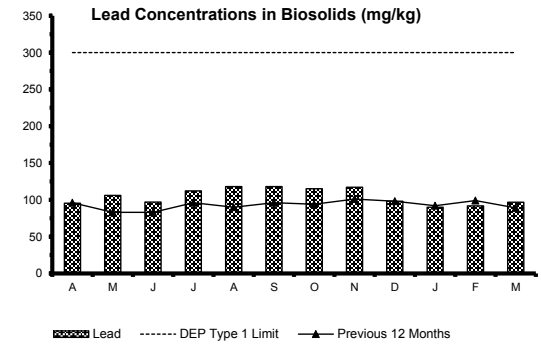
	0 to 120		121 to 180		181 or more		Total Permits Issued	
	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU
Jul	5	15	0	1	0	2	5	18
Aug	1	46	0	5	0	0	1	51
Sep	2	8	0	3	0	0	2	11
Oct	4	24	0	1	0	0	4	25
Nov	2	8	2	0	1	1	5	9
Dec	0	12	0	2	0	1	0	15
Jan	3	4	3	3	1	2	7	9
Feb	2	12	2	2	0	4	4	18
Mar	1	16	6	0	0	4	7	20
Apr							0	0
May							0	0
Jun							0	0
% YTD	57%	82%	37%	10%	6%	8%	35	176

In the 3rd Quarter of FY18, sixty-five permits were issued, eighteen of which were SIUs. Six of the eighteen SIU permits were issued within 120 days with one beyond the 180-day timeframe- falling far short of the EPA 's 90% requirement. There were fifteen non-SIU permits issued beyond the 120-day timeframe with ten of them beyond the 180-day timeframe.

TRAC has been undergoing personnel changes which has affected the workflow, resulting in delays in processing permits. Delays attributable to having to wait for data and/or approval from the municipality in which the industry was operating or intended to operate, mainly affect construction dewatering permits, but in some cases, new start-up industries. Late payment on invoices also is a factor in late issuances.

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.

Copper and lead levels remain relatively constant, below the DEP Type 1 Limit, and within the range of values over the past several years. A discussion of molybdenum concentrations in biosolids is included in the Deer Island Residuals Pellet discussion, on page 4.

Field Operations Highlights

3rd Quarter 2018 – FY18

Western Water Operations and Maintenance

- Carroll Water Treatment: Staff continued to support the Wachusett Aqueduct Pump Station Project. Staff completed half plant activities and placed the plant back into full operation. Staff participated in a week-long training session in Medium Voltage Maintenance Procedures and Safety. Staff repaired leaks in the Sodium Hypochlorite chemical delivery piping.

- Reservoir Operations: Chestnut Hill Gatehouse #1 Repair and Stabilization project is approximately 90% complete. Continue to assist in updating Dams Emergency Action Plans for western dams.

- Grounds and Aqueducts Maintenance: With the frozen ground and lack of mid-season snow, staff cleared a section of the Hultman Aqueduct in Southboro that had been historically muddy with no easy access. Trees were removed and proper drainage restored. Several late season snow storms created significant tree damage along easements and at multiple facilities. Efforts to remove all of the downed trees and restore access to all of the sites are ongoing.

- Brutsch Water Treatment Facility: The facility was shut down for several hours as a result of a high wind and turbidity event at Quabbin Reservoir. Staff were able to shut down the facility remotely and responded to the site during the storm to restart the plant after the wind event had subsided. Treatment effectiveness and service were not disrupted.

Metro Water Operations and Maintenance

- Water Pipeline Program: Five leaks were repaired during the third quarter. One occurred on Section 85 (a 36" pre-stressed concrete cylinder pipe) on March 28 in Revere. A contractor installing a new sewer lateral to a home cut into the pipe believing that it was either a drain or a sewer line. An emergency isolation of Section 85 occurred, with the affected communities being notified. A technician from the manufacturer came to the site and assisted with the installation of a 36" repair saddle on March 30. The main was returned to service in early April after flushing and collection of water quality samples. MWRA Risk Management Staff will be seeking cost recovery from the contractor.

- Six blow off valve retrofit projects were completed during the quarter. Several abandoned vehicles were removed from the Foss Reservoir during the winter drawdown of the reservoir. Leak detection community assistance was provided to Arlington, Chelsea, Chicopee, Lexington, Lynn, Medford, Milton, Revere, Somerville, Stoneham, Wakefield, Weston, and Woburn.

- Cold Weather Issues: The weather during early January was dominated by biting cold. Several issues occurred within the MWRA and community water systems due to the freezing temperatures. During the evening of January 1, BWSC experienced a leak on Brookline Avenue on the Boston/Brookline line. MWRA, BWSC, and Brookline all participated in a coordinated response. MWRA shut one valve downstream of Meter 245 to Boston; BWSC shut valves within their system which then isolated the leak. It was determined to be a very shallow air valve that froze and cracked. BWSC repaired the leaking valve, and the system returned to its normal configuration on January 2. MWRA experienced three air release valve leaks on three successive days. An air release valve leaked on Thursday night, January 11, on Section 53 on Eastern Avenue in Malden. Staff responded, isolated the water main, stopped the leak, and reactivated the main. On Friday, January 12, an air release valve leaked on Newton Street in Brookline on Section 96. Staff were able to isolate the leaking valve without the need to isolate the entire water main. On Saturday, January 13, another air release valve leaked on Section 96, also on Newton Street. Staff were able to isolate the leaking valve without the need to isolate the entire water main. MWRA Staff assisted Burlington on Sunday, January 14 and Monday, January 15, with leak detection as Burlington was having issues with water storage tank elevations. An emergency connection was opened between Lexington and Burlington to augment the Burlington supply, and closed after two days of operation. Staff also assisted Chicopee in locating a leak on a 6" water main. Several MWRA water mains across bridges were flushed to confirm water flowing to avoid freezing during the cold spell. On January 29, BWSC had a leaking air release valve on the bridge crossing between Somerville and Boston at Sullivan Square. Somerville, MWRA, and BWSC all responded to the site. BWSC was able to isolate the leak using all BWSC valves.

  EAP for City, City Extension and Dorchester Tunnels: Operations Engineering and Planning are finalizing operation plans for the reconfiguration of

the system during a tunnel isolation. Training will be conducted in the spring to give staff an overview of how to reconfigure MWRA service zones to supply communities if the City, City Tunnel Extension or the Dorchester Tunnels must be isolated.

SCADA & Process Control

- Water System Work: Upgrading the Loring Road Ventilation System to reduce electrical demand charges; Created SCADA/TELOG Top View Alarms; In-house project implement PLC replacement at Brutsch Water Treatment Facility.
- Wastewater Work: Supported Chelsea Headworks Rehabilitation, Caruso Pump Station Improvements and Nut Island Odor Control Improvements projects. Continued work on Prison Point Storm Water Wet Well Project; Completed in-house upgrade of the flow meter at Somerville Marginal Remote.

Wastewater Operations & Maintenance

- Remote Headworks Upgrades: Channel #1 was turned over to the contractor for rehabilitation at the beginning of January. Channel #1 rehabilitation, PCB remediation, electrical service, plumbing, fire protection and masonry upgrades, equipment relocation and new water main installation were continuously ongoing throughout the Quarter.
- Alewife Brook Pump Station Rehabilitation: The bypass pumping system was placed in service and the facility pumps were taken out of service on January 1st. Staff were onsite monitoring its operation during rain events throughout the Quarter.
- Nut Island Standard Operating Procedures (SOPs): Staff updated SOPs for putting screening channels and grit vortexes online and offline in remote control (via SCADA) and manual (local) control. Training for all Operations Staff on the updated SOPs was ongoing during the Quarter. Operations, Process Control and SCADA Staff are reviewing and updating the Nut Island Isolation Training to be given to all Operations Staff.
- Headworks Ductwork Cleaning & Repair: Staff reviewed and provided comments for the contractor's work plans for Columbus Park, Ward Street and Nut Island Headworks. The contractor has completed the duct cleaning at both Columbus Park and Ward Street and started the cleaning at Nut Island in February.

Metering

- Planning: Work on the Wastewater Metering Replacement project continues.
- Community Assistance: Notification and assistance was provided to communities 34 separate times where their water use was higher than expected.

Environmental Quality-Water

Regulatory and Non-Regulatory Sampling Programs: Staff collected samples for the Unregulated Contaminant Monitoring Rule (UCMR4) Program, that will monitor for 30 contaminants during 2018-2020 that do yet not have a health based standard set

Community Support: Staff provided support to the Peabody in response to customer complaints about unpleasant odors in drinking water supplied by Winona Pond.

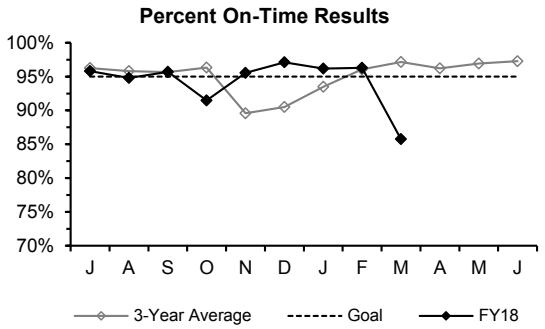
Contaminant Monitoring System: Staff assisted a diving contractor with the repair of the intake lines at the Route 12 Shed on January 31st. Repairs were completed and intake lines have been restored to their original depth in the reservoir. Staff, submitted a grant application to the Executive Office of Public Safety and Security, for a Radiological Monitor. Awards for grants are expected to be announced in Summer 2018.

Environmental Quality-Wastewater

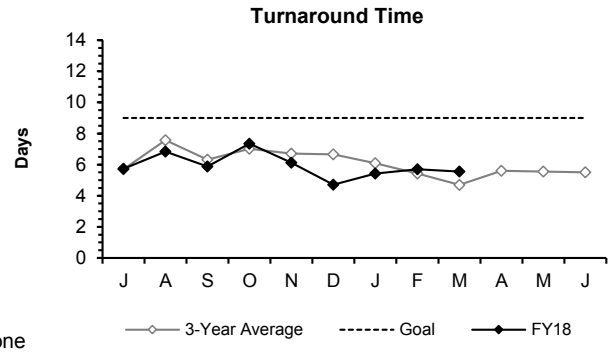
- Ambient Monitoring: At a meeting of EPA's Outfall Monitoring Science Advisory Panel, MWRA Staff and Consultants presented results from 2016 and 2017 monitoring. Regulators, science panel members, and members of the public-expressed confidence in MWRA's monitoring and the findings that the Boston Harbor Project has resulted in recovery in Boston Harbor without degrading the environment near the current outfall in Massachusetts Bay. Analysis and quality review of samples collected in 2017 was completed and data were discussed at a technical workshop in preparation for use synthesis reports.
- Harbor/CSO Monitoring: CSO receiving water monitoring continues in support of the water quality standards variance and the CSO assessment. CSO facility influent samples were collected at the request of Massachusetts Department of Environmental Protection (DEP). Biweekly harbor-wide monitoring continued.

Laboratory Services

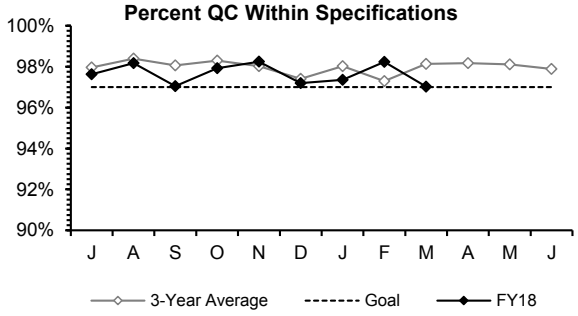
3rd Quarter - FY18



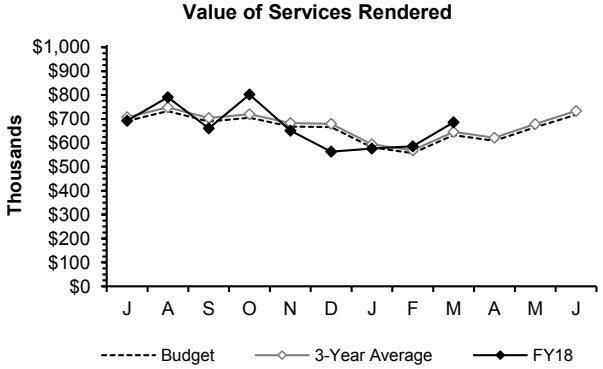
The Percent On-Time measurement was below the 95% goal one month of the quarter due to catching up on longer turnaround time projects. All regulatory reporting deadlines were met.



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 above the seasonally adjusted budget projection two months of the quarter. The workload for School Lead Testing has been lower than budgeted.

Highlights:

Dr. Delaney was elected chair of EPA's Environmenal Laboratory Advisory Board (ELAB).

Quality Assurance:

The every two years DEP lab certification audit at the Quabbin Lab had no deficiencies or deviations. Lab Services passed 359 of 363 (98.9%) of chemistry proficiency tests on the first try. Passing these is required to maintain DEP certification. Since September the Lab has worked diligently to address the changes in EPA's Methods Update Rule for wastewater testing. This effort is nearly complete and will be recognized when DEP issues new lab certifications in July.

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.

Clinton:

A special study of the mass balance of copper, iron, and phosphorus in the Clinton Treatment Plant is being conducted to understand the effect of new phosphorus removal approach, requiring rush turnaround time.

DITP: Experiments continue to simulate the die off of *enterococcus* bacteria and decay of chlorine in the DITP outfall tunnel.

Drinking Water:

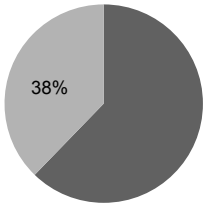
Sampling has begun for the new 3-year Unregulated Contaminant Monitoring Rule (UCMR). Most of this testing is being performed by EPA-approved contract labs. This monitoring helps EPA decide which contaminants need to be regulated.

Mobile Lab: A successful drill of the Mobile Lab instruments was conducted by Lab staff at the Carroll Water Treatment Plant.

CONSTRUCTION PROGRAMS

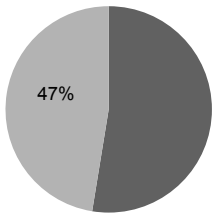
Projects In Construction
3rd Quarter– FY18

Money



Amount Remaining
Billed to Date

Time



Days Remaining
Days Expended

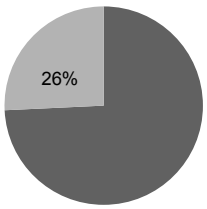
Reading Extension Sewer Rehabilitation

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: A progress meeting was held on 3/15/2018 to discuss pending repairs to defecting liners.

Money



Amount Remaining
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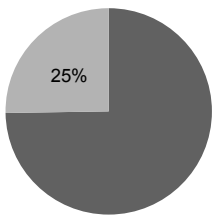
Time



Days Remaining
Days Expended

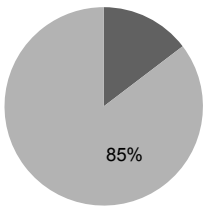
Chelsea Creek Headworks Upgrade

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

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

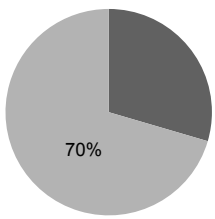
Status and Issues: As of March, the Contractor excavated and installed phase 1 of the 36" water main, reinstalled fuel UST, began installation of 4" domestic and 6" fire water mains and placed concrete for odor control pedestals.

Money



Amount Remaining
Billed to Date

Time



Days Remaining
Days Expended

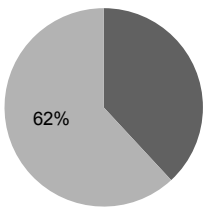
Wachusett Aqueduct Pumping Station

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

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

Status and Issues: As of March, the Contractor installed concrete, reinforcing steel and frame form work at the wing walls and 90 degree cast-in place elbow.

Money



Amount Remaining
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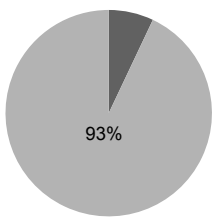
Time



Days Remaining
Days Expended

Alewife Brook Pump Station Improvements

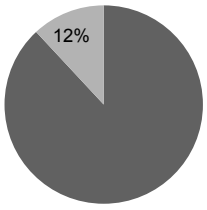
Project Summary: This project involves the replacement of wet-weather pumps, motors, gear drives, VFD's, MCC, screens, sluice gates, standby generator, roof, PLC's and HVAC. Also, the remediation of PCB's and asbestos and the installation of a flow meter on the 66-inch downstream Alewife Brook Conduit.

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

Status and Issues: As of March, the Contractor completed the mechanical installation of bar screens 1 & 2, removed the existing generator and began installation of structural steel in the Pump Room.

Projects In Construction
3rd Quarter– FY18

Money



Amount Remaining
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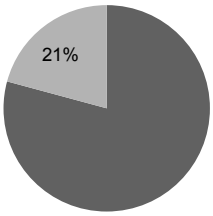
Time



Days Remaining
Days Expended

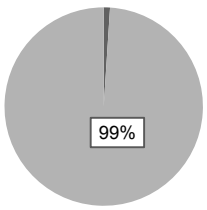
NIH Section 110 - Stoneham

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

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

Status and Issues: As of March, the Contractor installed 294-LF of 48" DIP water main along Cottage and Wright Streets, including the Montvale Avenue crossing. They pre-drilled ledge along Main Street.

Money



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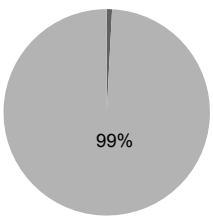


Days Remaining
Days Expended

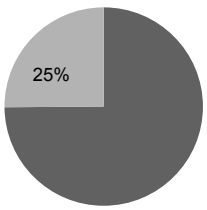
DITP Valves and Piping Replacements

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

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

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

Money



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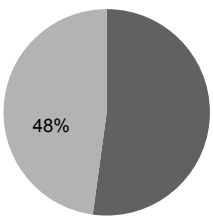


Days Remaining
Days Expended

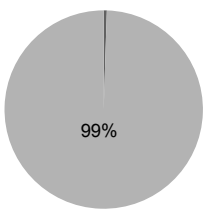
Winthrop Terminal VFD and Motor

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

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

Status and Issues: The demolition of VFD No 6 is complete. VFD No.6 commission testing is on-going.

Money



Amount Remaining
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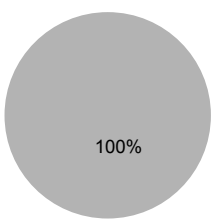


Days Remaining
Days Expended

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

3rd Quarter – FY18

All 35 projects in the Long-Term CSO Control Plan are complete, in compliance with Schedule Seven. Of the $910.6 million budget in the FY18 CIP for the CSO Control Program, approximately $8 million remain to be spent through 2021.

Project/Item	Status as of March 31, 2018
BWSC 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, MWRA's Board of Directors authorized removing the remaining $3.8 million from the BWSC MOU/FAA (which ended on June 30, 2017) and including this funding amount in a separate, 4-year financial assistance agreement with BWSC effective July 1, 2017. The new agreement limits the financial assistance to reimbursement of the eligible cost of construction work approved by MWRA.
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, and attained substantial completion of related surface restoration work by the end of 2017. MWRA made a final transfer of funds to the Cambridge CSO account in December 2017, in the amount of $1,254,551, to cover eligible costs (certain past and future) through June 30, 2018, when the MOU/FAA is scheduled to end. Over the remaining term, Cambridge will continue to support MWRA's final eligibility reviews.
MWRA CSO Performance Assessment	MWRA issued the Notice to Proceed with the contract for CSO Post-Construction Monitoring and Performance Assessment to AECOM Technical Services, Inc., in November 2017. The contract includes CSO inspections, overflow metering, hydraulic modeling, system performance assessments and water quality compliance assessments culminating in the submission of a report verifying attainment of court-ordered levels of CSO control to EPA and DEP in December 2020, in compliance with the last milestone in Schedule Seven. AECOM has completed inspections of more than 200 active or closed CSO regulator structures in part to support development of an overflow metering plan. The consultant's temporary meters are scheduled to be operational at 58 active CSO regulators by April 15. AECOM is also reviewing historical receiving water quality data collected by MWRA's Harbor Monitoring Program and is analyzing Alewife Brook data as a pilot, prior to recommending statistical analysis and assessment approaches for all of the receiving waters affected or formerly affected by CSO.

CIP Expenditures

3rd Quarter – FY18

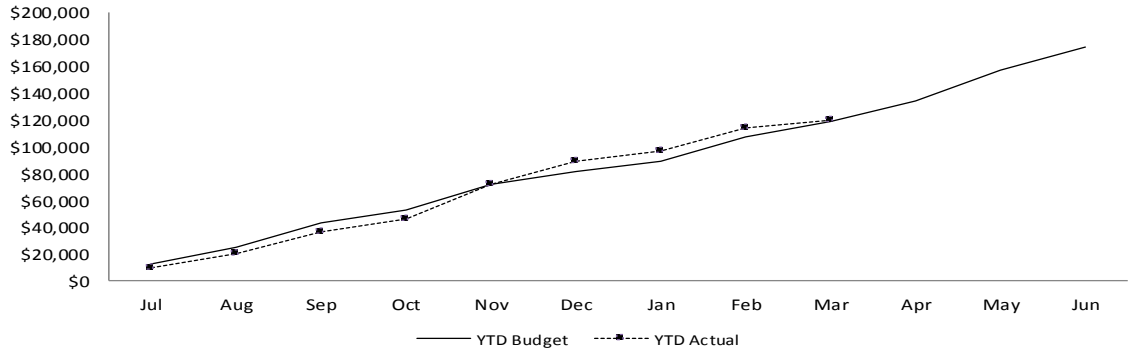
FY18 Capital Improvement Program Expenditure Variances through March by Program ($ in thousands)				
Program	FY18 Budget Through March	FY18 Actual Through March	Variance Amount	Variance Percent
Wastewater	59,167	50,412	(8,755)	-15%
Waterworks	55,178	67,816	12,639	23%
Business and Operations Support	4,180	1,981	(2,199)	-53%
Total	$118,525	$120,209	$1,684	1%

Project underspending within Wastewater was due to construction delays related to bypass pumping for the Alewife Brook Pump Station Construction, and for water main and fuel storage installations for the Chelsea Creek Upgrades Construction, less than budgeted community requests for I/I grants and loans, system testing delays for the Clinton Phosphorus Reduction contract, as well as work anticipated for FY18 that was completed in FY17 for the Deer Island Digester Sludge Pump Replacement Construction Phase 2 and the Deer Island Fuel Oil System Upgrades, lower award than budgeted for the Wastewater Metering, Study and Design contract, delay in award for the Chemical Bulk Storage Tanks Relining, and updated cost estimates for final work on the Cambridge Sewer Separation project. This was partially offset by progress on Chelsea Creek Upgrades Design/ESDC, the Winthrop Terminal Facility VFD Replacement, and Cambridge Sewer Study of Sections 186, 4, 5, and 6. Project overspending in Waterworks was due to construction progress for the Northern Intermediate High Phases 1C, 2, and 1B, Southern Extra High Section 111 Construction 1, Wachusett Pump Station Construction, Marlborough Maintenance Facility, greater than anticipated requests for community loans, timing of watershed land purchases, and progress on boring work for the Weston Aqueduct Supply Mains Design/MEPA/REI contract. This was partially offset by delay in award for Southern Extra High Redundancy Section 111 Construction 3, delay in pipe installation for Section 14 Pipe Relocation (Malden), and delay in Notice to Proceed and lower award than budgeted for Chestnut Hill Gatehouse #1 Repair.

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 3/24/2018	$51.1 million
Unused capacity under the debt cap:	$1.388 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	$229 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

3rd Quarter – FY18

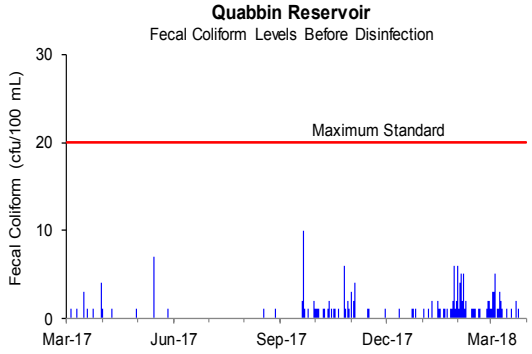
Source Water – Microbial Results

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 raw water tap before being treated and entering the CVA system.

All samples collected during the 3rd 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%.**

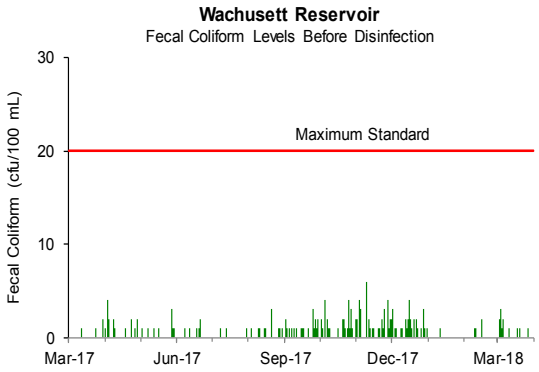


Sample Site: Wachusett Reservoir

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 3rd Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

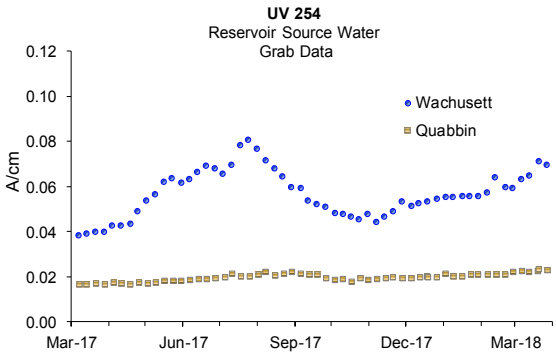


Source Water – UV Absorbance

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 0.023 A/cm.

Wachusett Reservoir UV-254 levels are currently around 0.070 A/cm.



Source Water – Turbidity

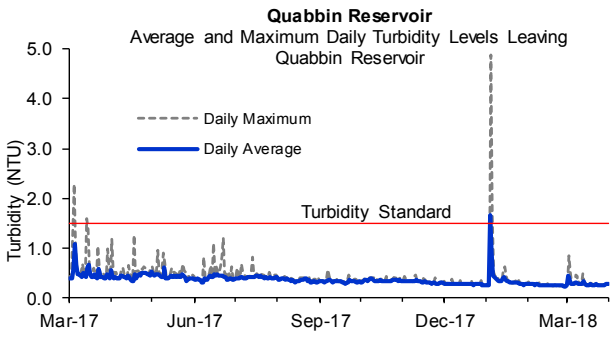
3rd Quarter – FY18

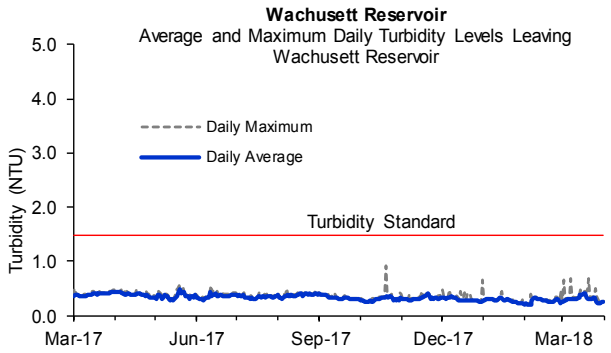
Turbidity is a measure of suspended and colloidal particles including clay, silt, organic and inorganic matter, algae and microorganisms. The effects of turbidity depend on the nature of the matter that causes the turbidity. High levels of particulate matter may have a higher disinfectant demand or may 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 five NTU (Nephelometric Turbidity Units), and water only can be above one NTU if it does not interfere with effective disinfection.

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

- On January 4 and into January 5, a nor'easter with high winds (over 40 mph) caused a maximum turbidity of 4.9 NTU at BWTF's raw water intake. As a result of the elevated turbidity in the Quabbin Reservoir, MWRA shut down BWTF at 3:20pm, with supply then coming from MWRA and community water tanks. DEP and the CVA communities were provided multiple notifications as data became available, beginning at 1:30pm on January 4. When the weather conditions improved, BWTF was restarted at 9:50pm. During this period, UV treatment was unaffected, chlorine residuals leaving the facility and at Ludlow Monitoring Station (LMS) were maintained and CT was well above regulatory requirements. All samples taken at LMS during and after the event were absent of total coliform. There was no impact to water quality to the CVA communities.

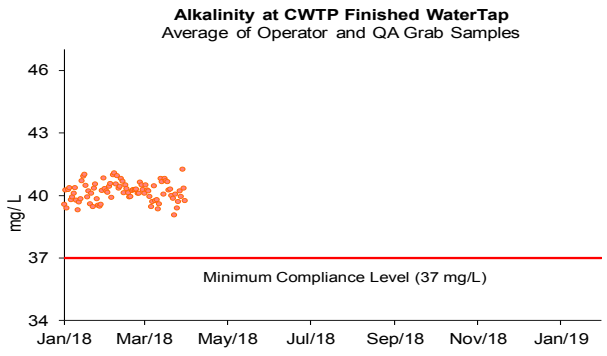


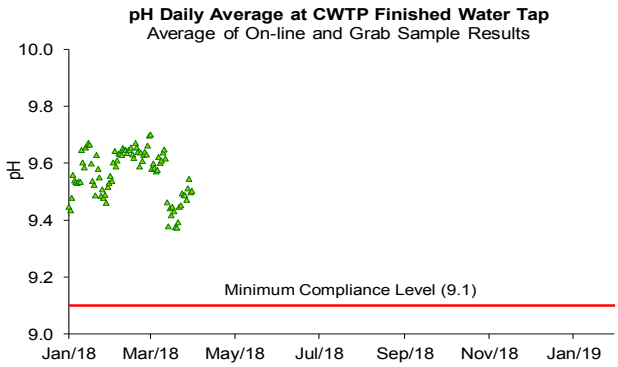


Treated Water – pH and Alkalinity Compliance

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 March 15 and 16, 2018. Distribution system sample pH ranged from 9.5 to 9.7 and alkalinity ranged from 39 to 41 mg/L. No sample results were below DEP limits for this quarter.





Treated Water – Disinfection Effectiveness

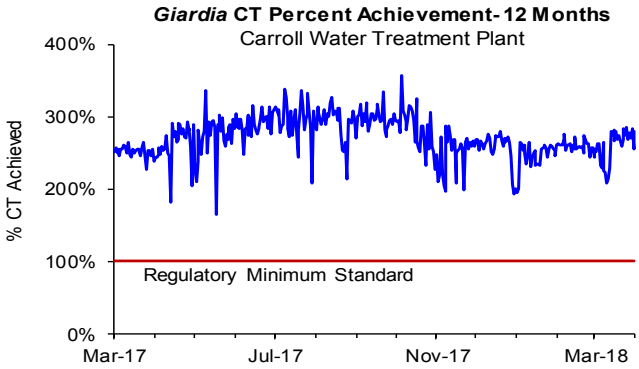
3rd Quarter – FY18

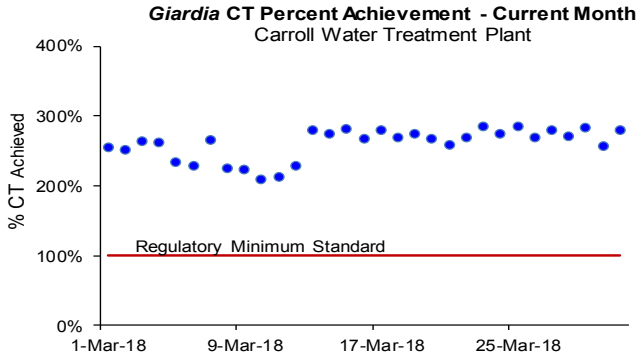
At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA 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:

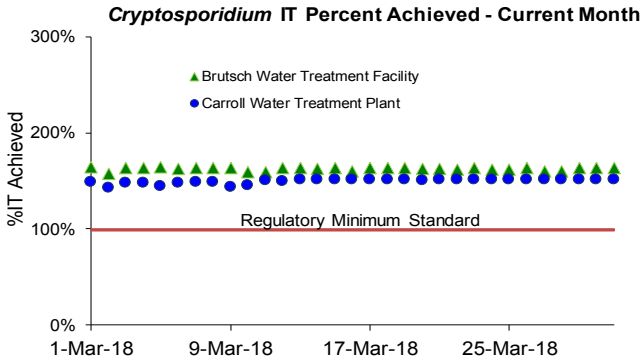
- Ozone dose at the CWTP varied between 1.6 to 2.2 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.

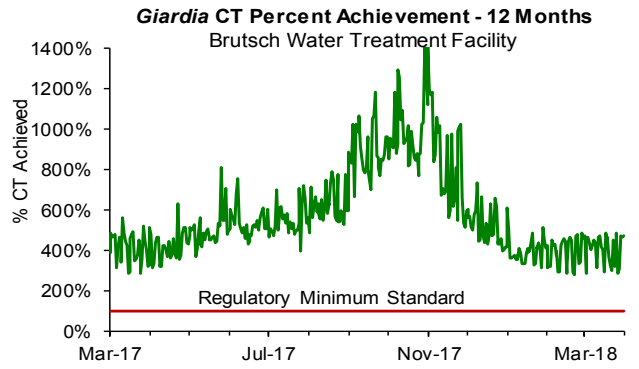


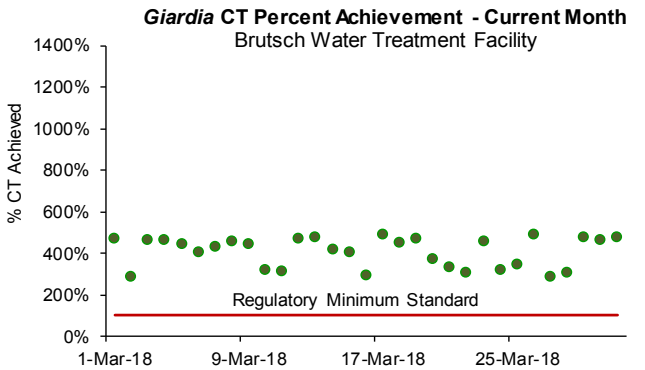


Quabbin Reservoir (CVA Supply) at:
Brutsch Water Treatment Facility

- 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 varied between 1.3 to 1.5 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%.







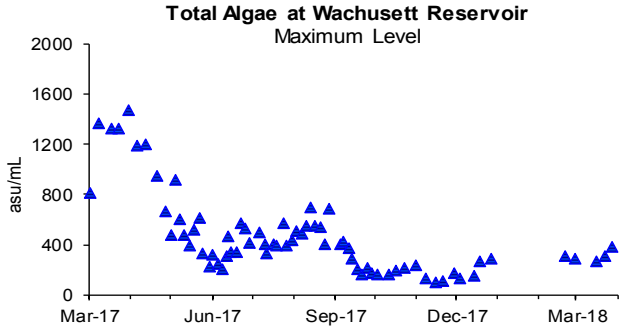
Source Water - Algae

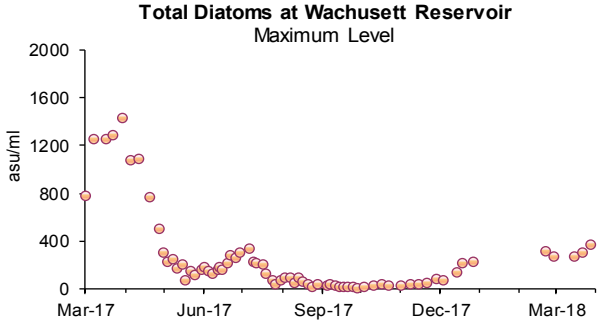
3rd Quarter – FY18

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 3rd Quarter, one complaint which may be related to algae was reported from a local water department. There were no samples collected between December 28, 2017 and February 20, 2018 as significant ice cover on the reservoir prevented safe algae sampling. For MWRA supplied water, there were no complaints related to algae reported during April and March from the local water departments





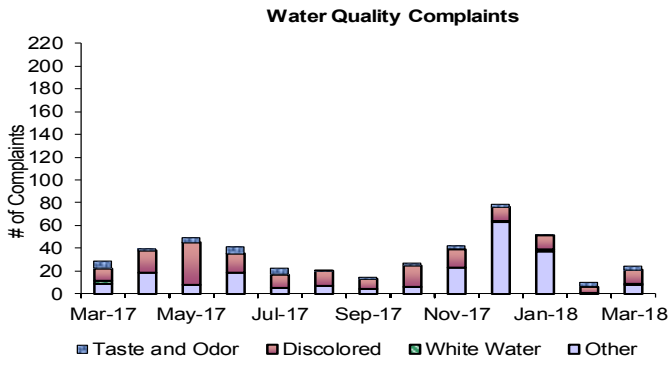
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

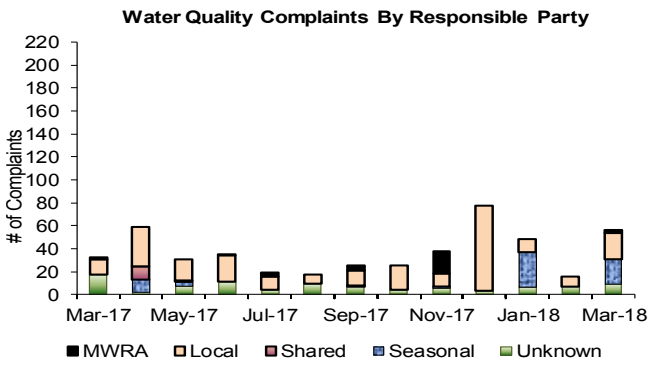
MWRA collects information on water quality complaints that typically fall into four categories: 1.) discoloration due to MWRA or local pipeline work; 2.) taste and odor due to algae blooms in reservoirs or chlorine in the water; 3.) white water caused by changes in pressure or temperature that traps 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 120 complaints during the quarter compared to 136 complaints from 3rd Quarter of FY17. Of these complaints, 42 were for "discolored water", 29 were for "taste and odor", 3 were for "white water", and 46 were for "other". Of these complaints, 43 were local community issues, 2 were MWRA related, 53 were seasonal in nature, and 22 were unknown in origin. (Note: Twenty-two of these complaints (reported as taste and odor, community issue, seasonal complaints) were from Peabody, due to an algae bloom in their local reservoir).

- On January 2, twenty "no water" complaints were reported from various neighborhoods in Boston.





Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

3rd Quarter – FY18

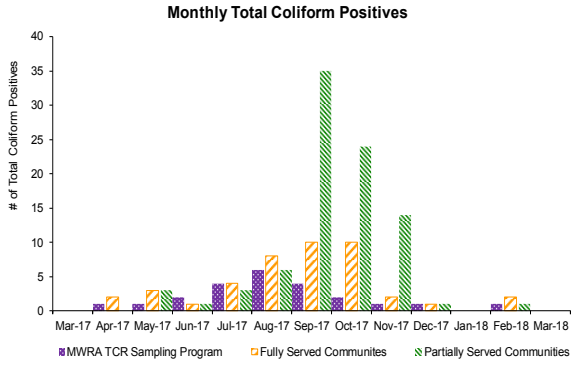
While all communities collect bacteria samples and chlorine residual data for the Total Coliform Rule (TCR), data from the 44 systems that use MWRA's Laboratory are reported below.
The MWRA TCR program has 141 sampling locations. These locations include sites along MWRA's transmission system, water storage 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 3rd Quarter, three of the 6,220 community samples (0.05% system-wide) submitted to MWRA labs for analysis tested positive for total coliform. One of the 1,890 Shared community/MWRA samples (0.05%) tested positive for total coliform (Malden – February). At the end of the 3rd Quarter, only 0.2% of the samples had a chlorine residual lower than 0.2 mg/L. No community violated the TCR.

NOTES:

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



			Total Colliform # Samples (b)	Total Colliform # (%) Positive	E.coli # Positive	Assessment Required
MWRA	a	MWRA Locations	310	0 (0%)	0	
	a	Shared Community/MWRA sites	1580	1 (0.06%)	0	
		Total: MWRA	1890	1 (0.05%)	0	No
Fully Served		ARLINGTON	161	0 (0%)	0	
		BELMONT	104	0 (0%)	0	
		BOSTON	780	0 (0%)	0	
		BROOKLINE	224	0 (0%)	0	
		CHELSEA	169	0 (0%)	0	
		DEER ISLAND	52	0 (0%)	0	
		EVERETT	169	0 (0%)	0	
		FRAMINGHAM	234	0 (0%)	0	
		LEXINGTON	117	0 (0%)	0	
		LYNNFIELD	18	0 (0%)	0	
		MALDEN	237	1 (0.42%)	0	No
		MARBLEHEAD	72	0 (0%)	0	
		MEDFORD	221	0 (0%)	0	
		MELROSE	117	0 (0%)	0	
		MILTON	102	0 (0%)	0	
		NAHANT	30	0 (0%)	0	
		NEWTON	277	0 (0%)	0	
		NORTHBOROUGH	48	0 (0%)	0	
		NORWOOD	99	0 (0%)	0	
		QUINCY	302	1 (0.33%)	0	No
		READING	130	0 (0%)	0	
		REVERE	180	0 (0%)	0	
		SAUGUS	104	0 (0%)	0	
		SOMERVILLE	273	0 (0%)	0	
		SOUTHBOROUGH	30	0 (0%)	0	
		STONEHAM	91	0 (0%)	0	
		SWAMPSCOTT	52	0 (0%)	0	
		WALTHAM	216	0 (0%)	0	
		WATERTOWN	130	0 (0%)	0	
		WESTBORO HOSPITAL	15	0 (0%)	0	
		WESTON	45	0 (0%)	0	
		WINTHROP	72	0 (0%)	0	
		Total: Fully Served	*4871*	*2 (0.04%)*		
Partially Served	c	BEDFORD	60	1 (1.67%)	0	No
	c	CANTON	90	0 (0%)	0	
	c	HANSCOM AFB	33	0 (0%)	0	
	c	MARLBOROUGH	126	0 (0%)	0	
	c	NEEDHAM	123	0 (0%)	0	
	c	PEABODY	221	0 (0%)	0	
	c	WAKEFIELD	149	0 (0%)	0	
	c	WELLESLEY	114	0 (0%)	0	
	c	WILMINGTON	87	0 (0%)	0	
	c	WINCHESTER	91	0 (0%)	0	
	c	WOBURN	195	0 (0%)	0	
CVA	d	SOUTH HADLEY FD1	60	0 (0%)	0	
		Total: CVA & Partially Served	*1349*	*1 (0.07%)*		
		Total: Community Samples	*6220*	*3 (0.05%)*		

Chlorine Residuals in Fully Served Communities

	2017										2018		
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
% <0.1	0.1	0.0	0.1	0.1	0.3	1.0	1.1	0.8	0.7	0.6	0.2	0.1	0.1
% <0.2	0.1	0.1	0.1	0.2	0.8	2.9	2.9	2.6	2.6	1.2	0.5	0.2	0.2
% <0.5	0.7	0.7	0.4	0.7	3.5	6.2	6.8	6.1	6.1	3.4	1.5	0.6	0.8
% <1.0	1.1	1.3	1.2	2.1	7.4	13.4	11.5	10.3	10.3	6.5	3.5	2.3	1.5
% ≥1.0	98.9	98.7	98.8	98.0	92.6	86.6	88.5	89.7	89.7	93.5	96.5	97.7	98.5

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

3rd 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.

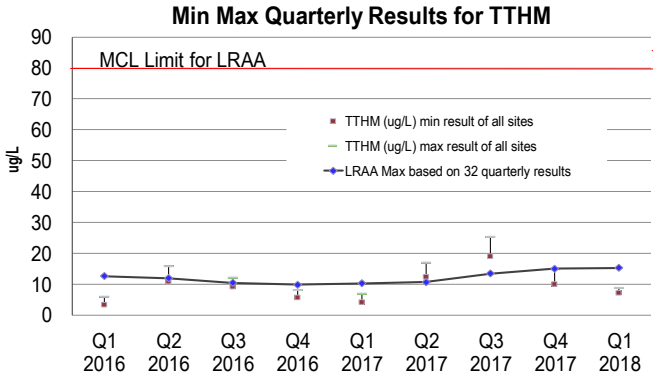
The locational running annual average at each individual sampling location must be below the standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

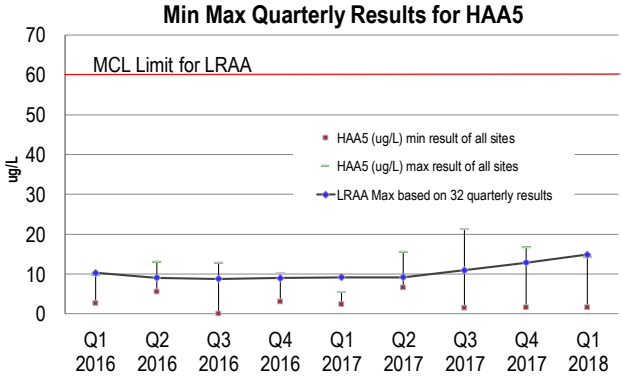
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1).

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.

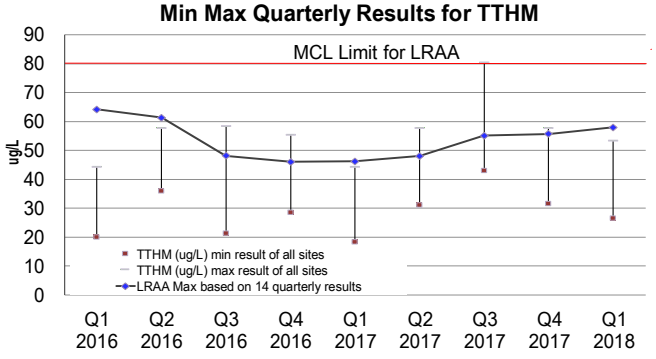
The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 15.2 ug/L; HAA5s = 14.8 ug/L. The current RAA for Bromate = 0.0 ug/L. CVA's DBP levels continue to be below current standards.

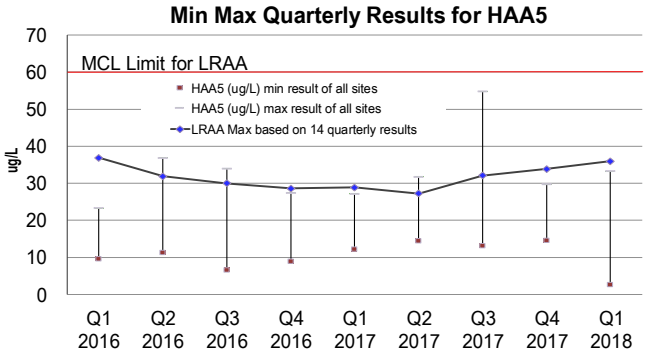
MetroBoston Disinfection By-Products





CVA Disinfection By-Products (Combined Results)





Water Supply and Source Water Management

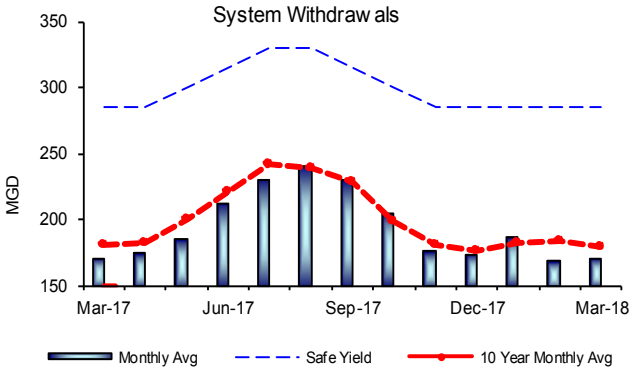
3rd Quarter – FY18

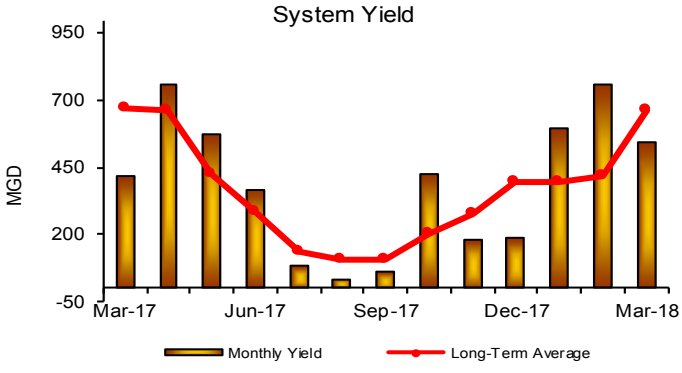
Background

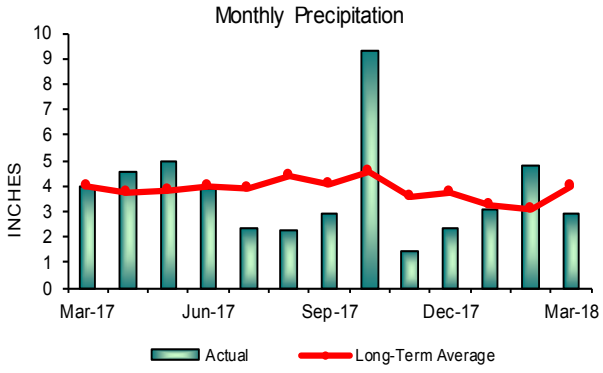
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir 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.

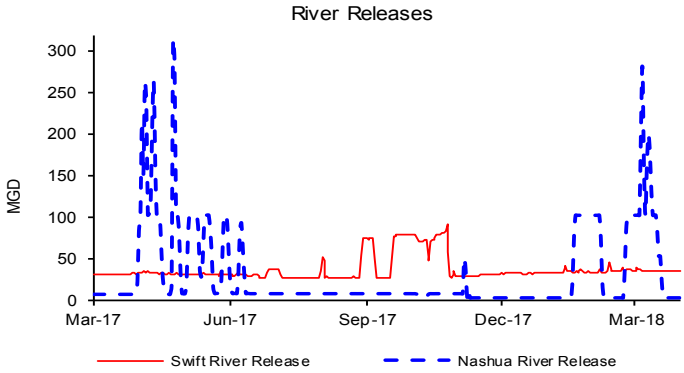
Outcome

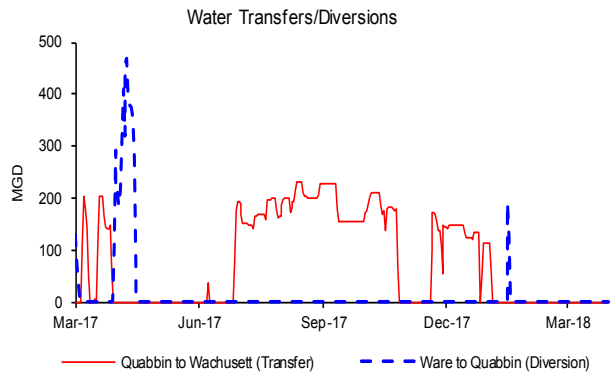
The volume of the Quabbin Reservoir was at 92.8% as of March 31, 2018; a 7.9% increase for the quarter, which represents a gain of over 32.8 billion gallons of storage and an increase in elevation of 4.38' for the quarter. The system is in "normal" operating range. Precipitation and yield for the quarter were above their long term averages. System withdrawal for the quarter was below the 10 year monthly average.

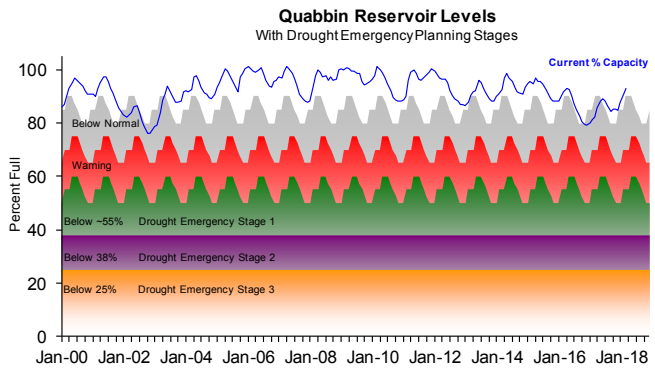












WASTEWATER QUALITY

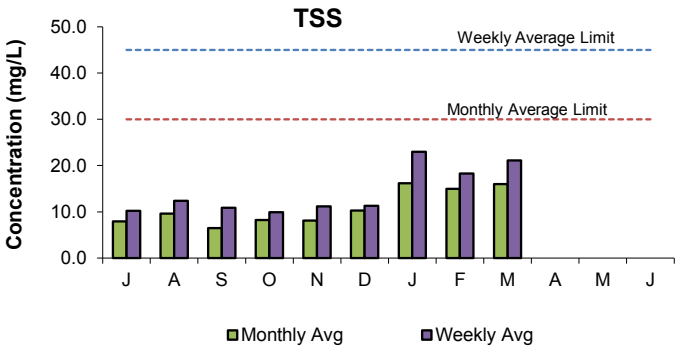
NPDES Permit Compliance: Deer Island Treatment Plant

3rd Quarter - FY18

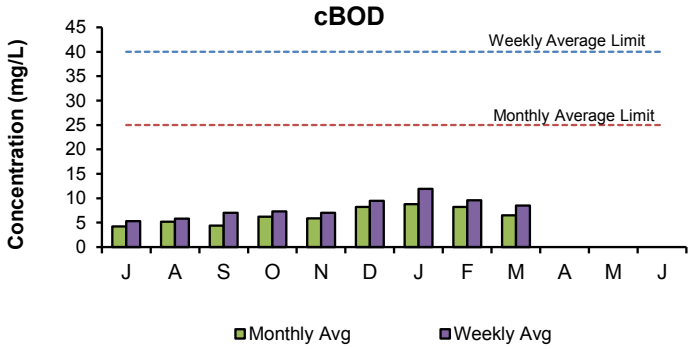
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*January*	*February*	*March*	*3rd Quarter Violations*	*FY18 YTD Violations*
Dry Day Flow:		mgd	436	277.1	279.8	289.2	0	0
cBOD:	Monthly Average	mg/L	25	8.8	8.2	6.5	0	0
	Weekly Average	mg/L	40	11.9	9.6	8.5	0	0
TSS:	Monthly Average	mg/L	30	16.2	15.0	16.0	0	0
	Weekly Average	mg/L	45	23.0	18.3	21.1	0	0
TCR:	Monthly Average	ug/L	456	0	0	1	0	0
	Daily Maximum	ug/L	631	0	0	13	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	8	6	9	0	0
	Weekly Geometric Mean	col/100mL	14000	44	10	23	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	6.5-7.0	6.5-7.0	6.5-7.0	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	100	100	100	0	0
	Inland Silverside	%	≥1.5	100	100	100	0	0

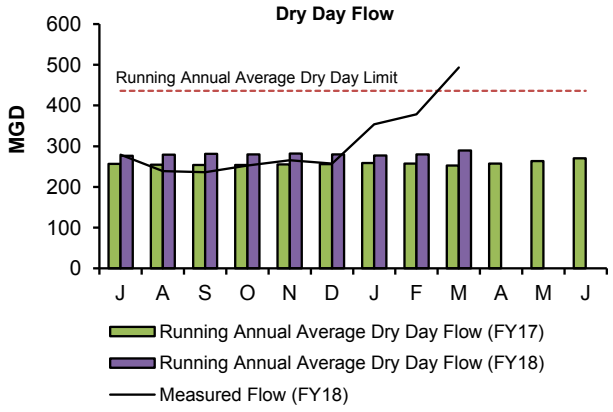
There have been no permit violations in FY18 to date at the Deer Island Treatment Plant (DITP).



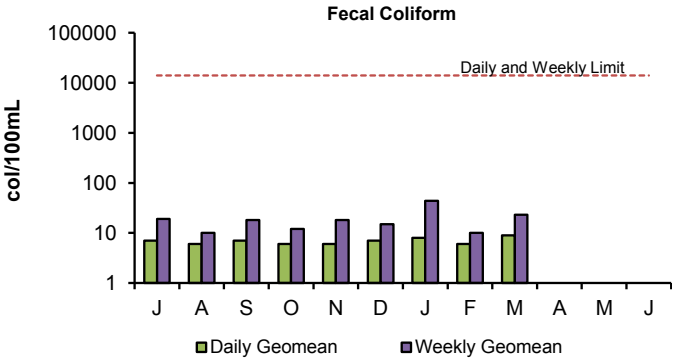
Total Suspended Solids (TSS) in the effluent is a measure of the amount of solids that remain suspended after treatment. All TSS measurements for the 3rd Quarter were within permit limits.



Carbonaceous Biochemical Oxygen Demand (cBOD) is a measure of the amount of dissolved oxygen required for the decomposition of organic materials in the environment. All cBOD measurements for the 3rd Quarter were within permit limits.



Running Annual Average Dry Day Flow is the average of all dry weather influent flows over the previous 365 days. The Dry Day Flow for the 3rd Quarter was well below the permit limit of 436 MGD.



Fecal Coliform is an indicator for the possible presence of pathogens. The levels of these bacteria after disinfection show how effectively the plant is inactivating many forms of disease-causing microorganisms. In the 3rd Quarter, all permit conditions for fecal coliform were met.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant

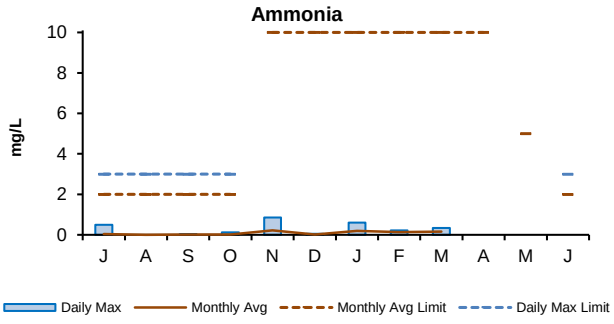
3rd Quarter - FY18

NPDES Permit Limits

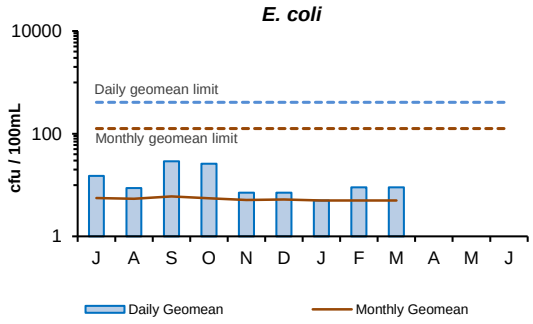
Effluent Characteristics		*Units*	*Limits*	*January*	*February*	*March*	*3rd Quarter Violations*	*FY18 YTD Violations*
Flow:		mgd	3.01	2.49	2.54	2.65	0	0
BOD:	Monthly Average:	mg/L	20	1.7	1.5	1.3	0	0
	Weekly Average:	mg/L	20	2.9	2.1	2.1	0	0
TSS:	Monthly Average:	mg/L	20	7.4	7.8	6.9	0	0
	Weekly Average:	mg/L	20	9.6	8.1	8.1	0	0
pH:		SU	6.5-8.3	7.0-7.7	6.9-7.5	6.9-7.4	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	10.3	10.1	10.4	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	5.0	5.0	5.0	0	0
	Daily Geometric Mean:	cfu/100mL	409	5.0	9.0	9.0	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
Copper:	Monthly Average:	ug/L	11.6	10.3	9.2	8.5	0	0
	Daily Maximum:	ug/L	14.0	12.1	9.2	9.0	0	0
Total Ammonia Nitrogen: November 1st - March 31st	Monthly Average:	mg/L	10.0	0.20	0.13	0.16	0	0
	Daily Maximum:	mg/L	35.2	0.60	0.22	0.34	0	0
Total Phosphorus: November 1st - March 31st	Monthly Average:	mg/L	RPT*	0.22	0.19	0.11	0	0
	Daily Maximum:	mg/L	RPT*	0.77	0.22	0.19	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.
2nd Quarter: There were no permit violations in the second quarter.
3rd Quarter: There were no permit violations in the third quarter.

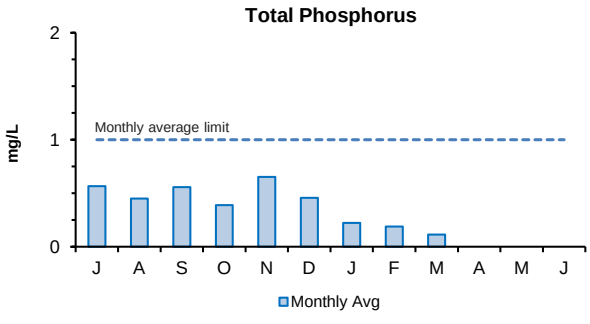
* The winter period (November 1 - March 31) phosphorus limit of 1.0 mg/L goes into effect November 1, 2019
+Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



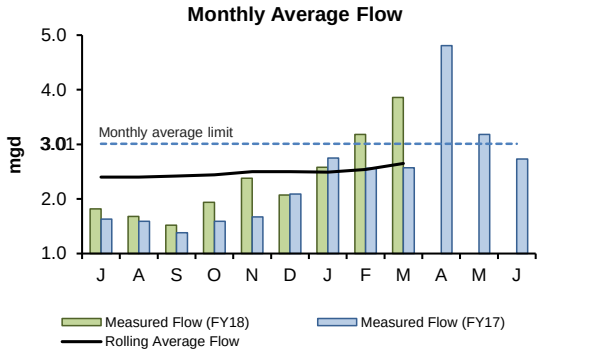
The 3rd Quarter's monthly average and daily maximum concentrations were below the permit limits. The monthly average and daily maximum limits for the 3rd Quarter are 10.0 mg/L and 35.2 mg/L, respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.



E. coli is an indicator for the possible presence of pathogens. There were no violations of permit limits in the 3rd Quarter.The monthly and daily limits are 126 cfu/100 mL and 409 cfu/100 mL respectively.



The 3rd Quarter's monthly average concentrations for total phosphorus were below permit limits. An interim permit limit of 1.0 mg/L is in effect from April through October, until April 1st, 2019, when the new permit limit of 0.15 mg/L goes into effect for April - October. The new permit limit of 1.0 mg/L from November through March goes into effect. November 1st, 2019.

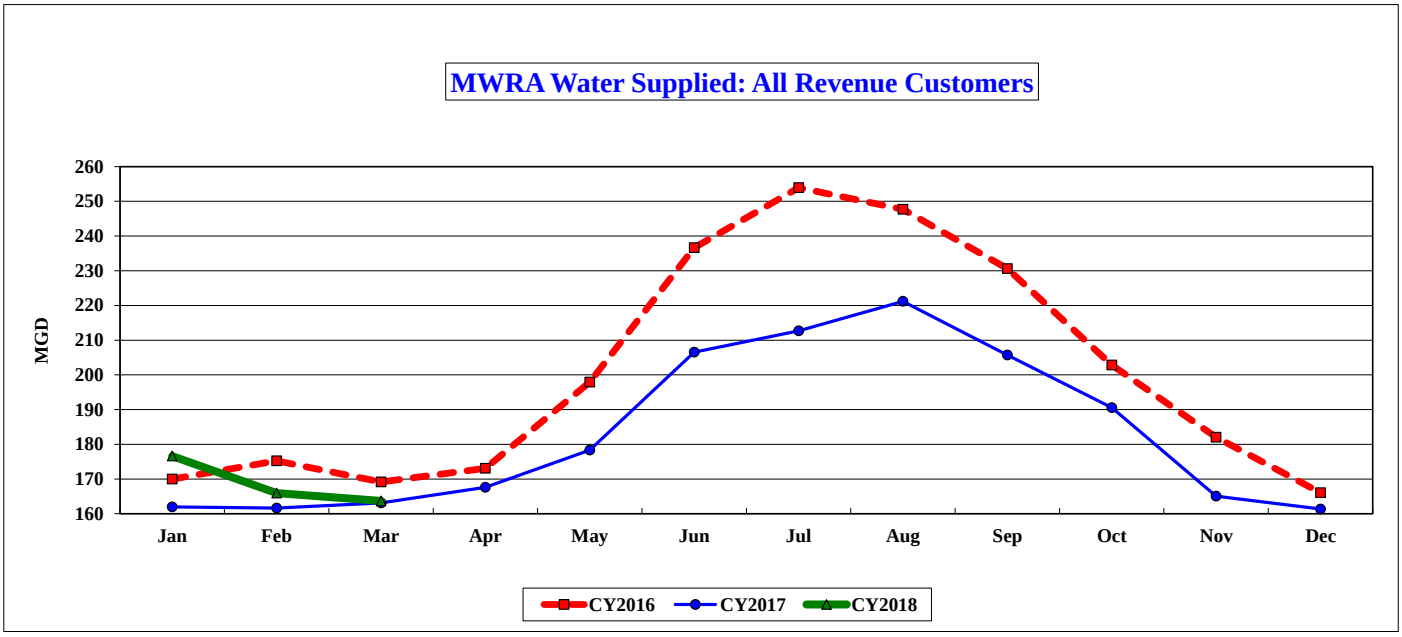


The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The average monthly flows during the 3rd Quarter were below the NPDES permit limit.

COMMUNITY FLOWS AND PROGRAMS

Total Water Use

3rd Quarter - FY18



MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2016	169.989	175.229	169.161	173.080	197.940	236.644	253.923	247.681	230.631	202.827	182.020	166.059	171.377	200.513
CY2017	161.943	161.611	163.130	167.614	178.332	206.541	212.662	221.176	205.729	190.567	165.067	161.366	162.248	183.118
CY2018	176.589	165.963	163.686	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	168.769	168.769

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Total	Annual Total
CY2016	5,269.650	5,081.631	5,244.002	5,192.412	6,136.128	7,099.331	7,871.618	7,678.123	6,918.941	6,287.652	5,460.602	5,147.831	15,595.283	73,387.922
CY2017	5,020.236	4,525.100	5,057.028	5,028.411	5,528.280	6,196.226	6,592.520	6,856.455	6,171.870	5,907.565	4,952.000	5,002.333	14,602.364	66,838.023
CY2018	5,474.270	4,646.951	5,074.263	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15,195.483	15,195.483

The March 2018 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 2018 water use will be used to allocate the FY20 water utility rate revenue requirement. March 2017 water supplied of 163.7 mgd (for revenue generating users) is up 0.6 mgd or 0.3% compared to March 2017.

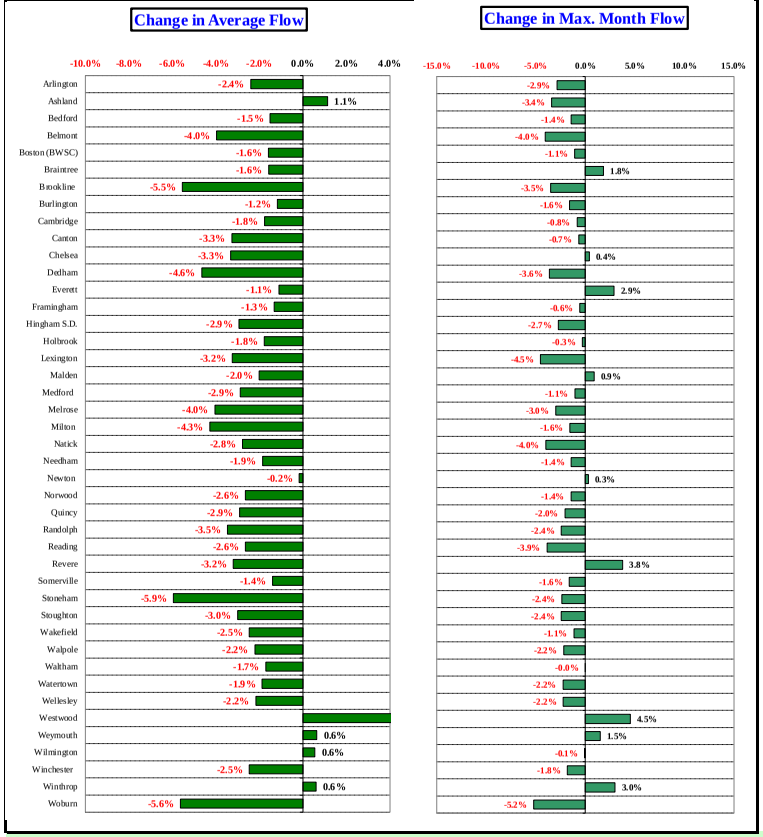
System-wide year to date consumption for CY18 is higher than CY17 with 168.8 mgd being supplied to MWRA customers through March. This is 6.6 mgd higher than CY17, and is an increase of 4.1%.

Community Wastewater Flows

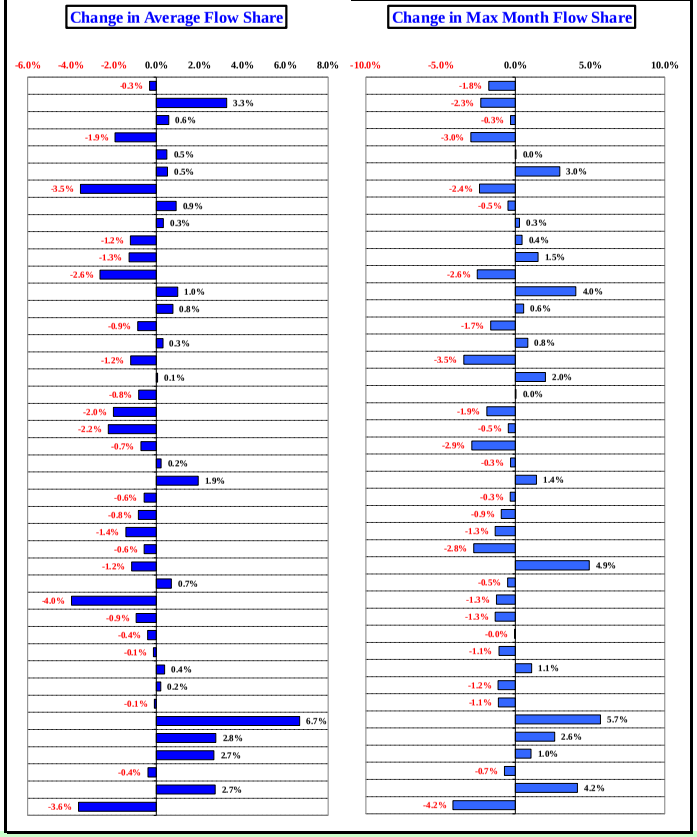
3rd Quarter - FY17

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

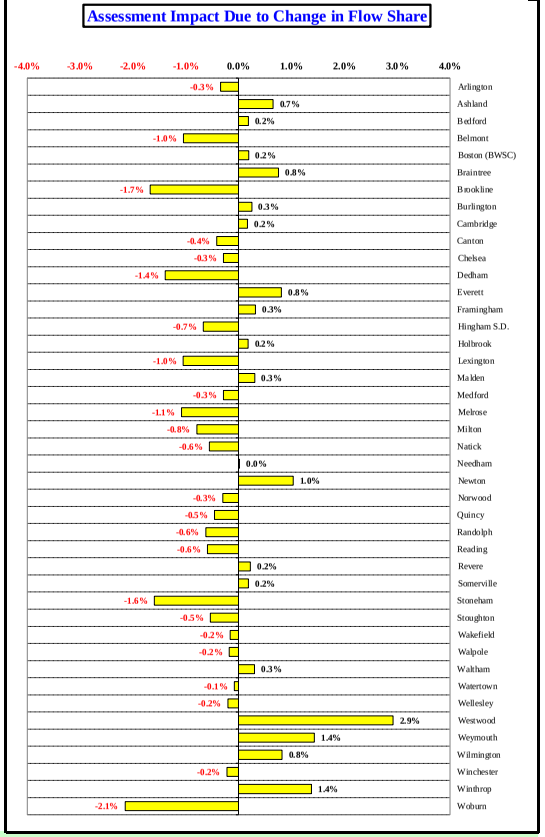
The flow components of FY2019 sewer assessments will be calculated using a 3-year average of CY2015 to CY2017 wastewater flows compared to FY2018 assessments that used a 3-year average of CY2014 to CY2016 wastewater flows.



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 04/10/17. Flow data is preliminary and subject to change pending additional MWRA and community review.

[3] CY2014 to February CY2017 wastewater flows based on actual meter data. March-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.

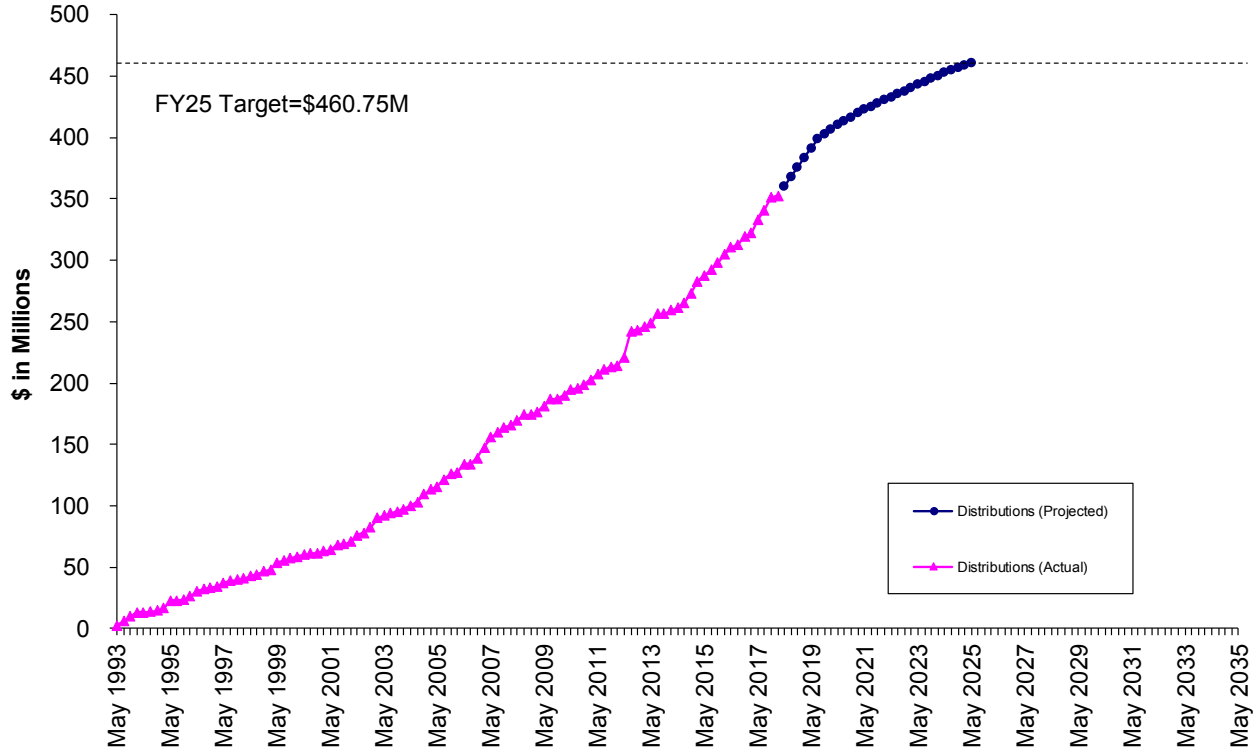
Community Support Programs

3rd Quarter – FY18

Infiltration/Inflow Local Financial Assistance Program

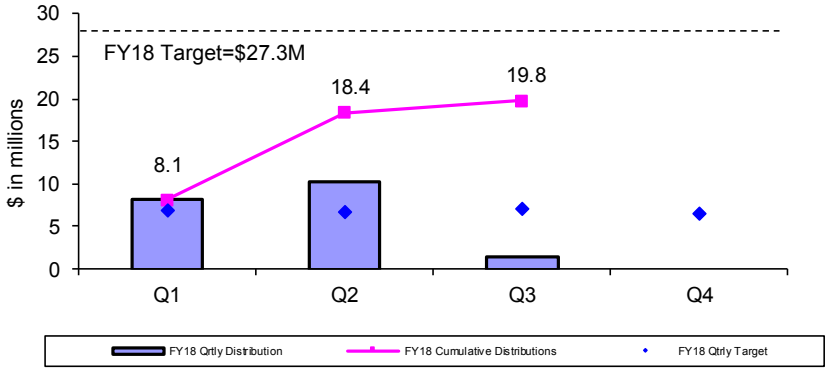
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides $460.75 million in grants and interest-free loans (average of about $14 million per year from FY93 through FY25) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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 3rd Quarter of FY18, $1.4 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Stoughton and Watertown. Total grant/loan distribution for FY18 is $19.8 million. From FY93 through the 3rd Quarter of FY18, all 43 member sewer communities have participated in the program and more than $352 million has been distributed to fund 541 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

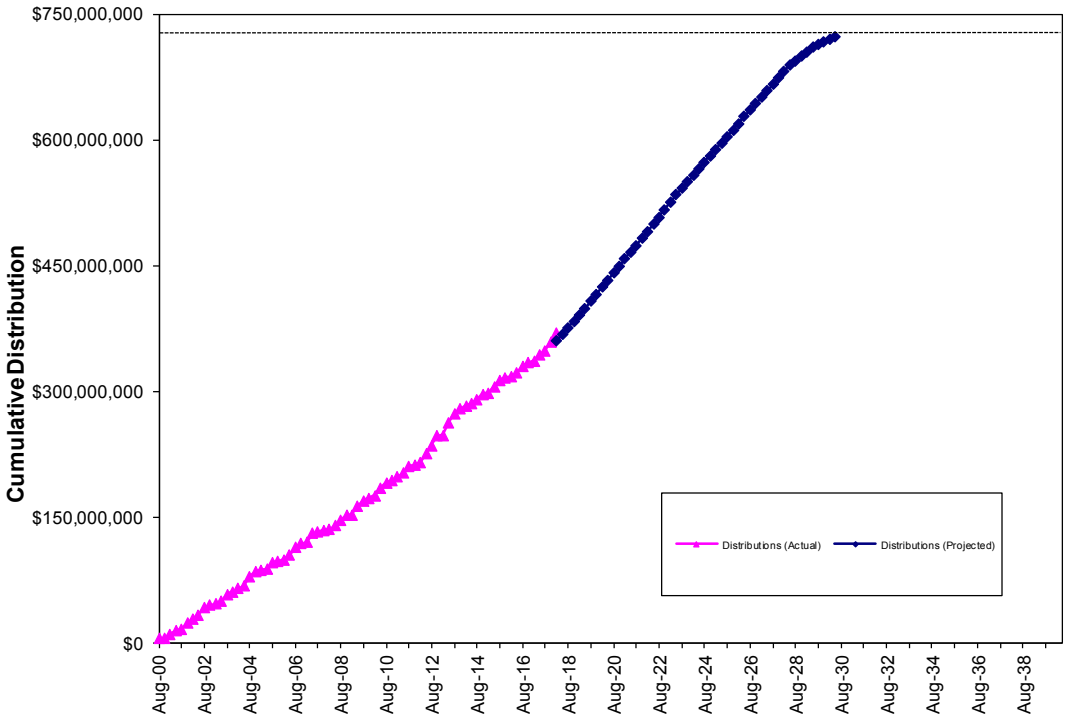


Community Support Programs
3rd Quarter – FY18

Local Water System Assistance Program

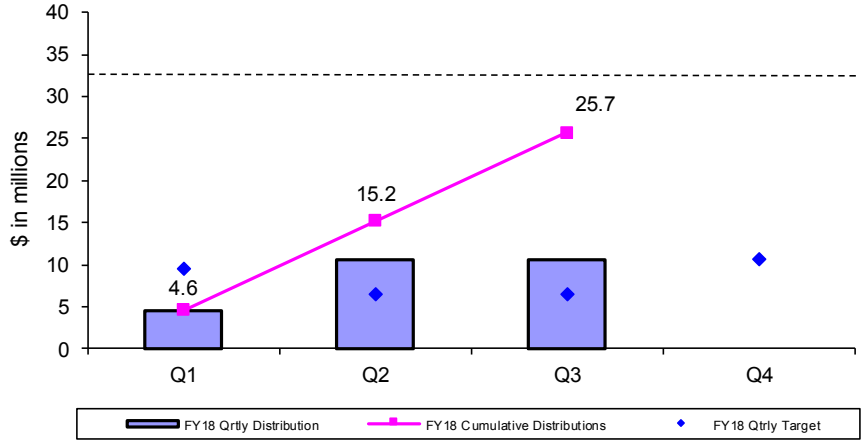
MWRA's Local Water System Assistance Programs (LWSAP) provides $724 million in interest-free loans (an average of about $24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have 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 3rd Quarter of FY18, $10.5 million in interest-free loans was distributed to fund local water projects in Boston, Brookline, Quincy, Watertown and Winthrop. Total loan distribution for FY18 is $25.7 million. From FY01 through the 3rd Quarter of FY18, more than $370 million has been distributed to fund 402 local water system rehabilitation projects in 42 MWRA member water communities. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY18 Quarterly Distributions of Water Loans



Community Support Programs

3rd 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.

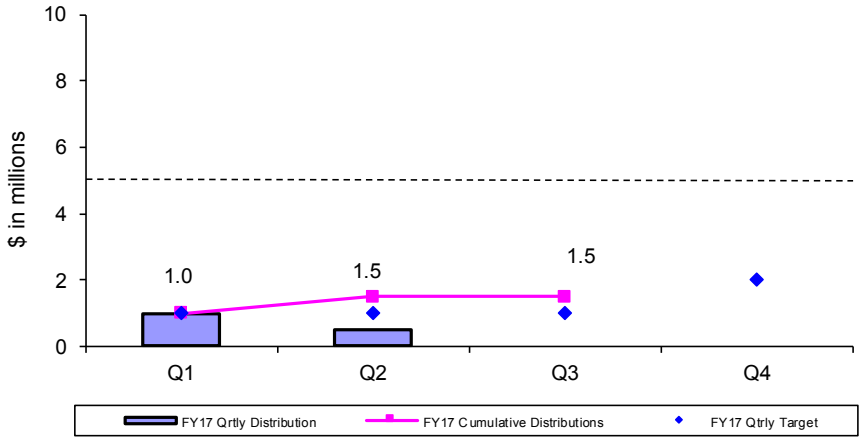
FY17 was the first year of the Lead Service Line Replacement Loan Program. During FY17, MWRA made three Lead Loan Program distributions to Newton for $4.0 Million, Quincy for $1.5 Million, and Winchester for $0.5 Million.

FY18 is the second year of the Lead Loan Program. During FY18, three Lead Loan Program Distributions have been made to Marlborough for $1.0 Million, Revere for $0.2 Million and Winthrop for $0.3 Million. No additional Lead Loan Program distributions were made during the 3rd Quarter of FY18.

Summary of Lead Loans:

Revere in FY18	$0.2 Million
Winthrop in FY18	$0.3 Million
Marlborough in FY18	$1.0 Million
Newton in FY17	$4.0 Million
Quincy in FY17	$1.5 Million
Winchester in FY17	$0.5 Million
TOTAL	$7.5 Million

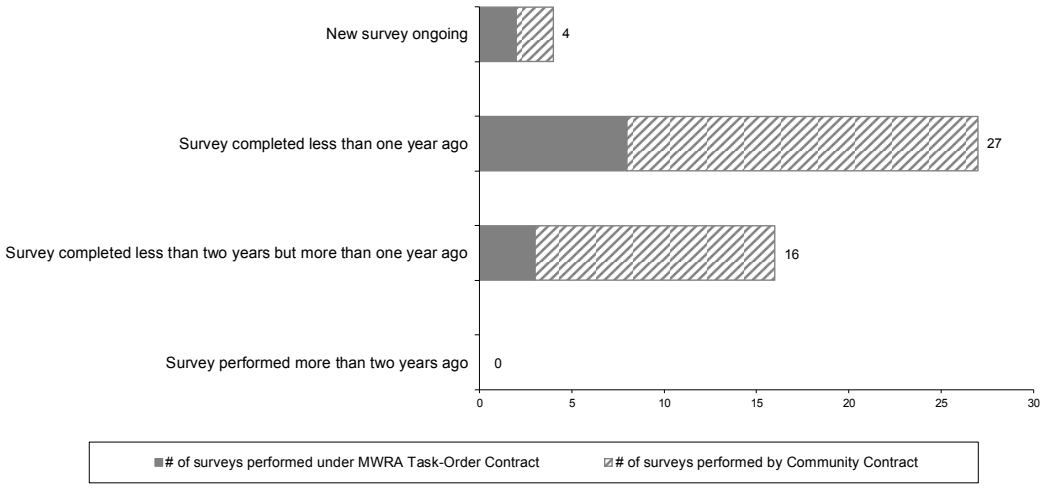
FY18 Quarterly Distributions of Lead Service Line Replacement Loans



Community Support Programs
3rd 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 3rd 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	20,496	47,812		70,078
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	2,018	1,346	2,941		6,305
Toilet Leak Detection Dye Tablets	------	6,126	1,337	4,783		12,246

BUSINESS SERVICES

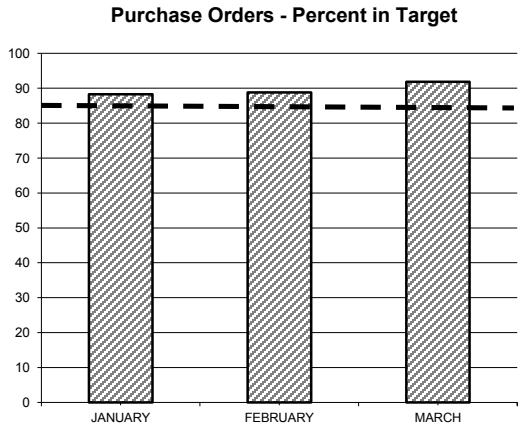
Procurement: Purchasing and Contracts

Third Quarter - FY18

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

Outcome: Processed 95% of purchase orders within target; Average Processing Time was 4.92 days vs. 4.37 days in Qtr 3 of FY17. Processed 73% (11 of 15) of contracts within target timeframes; Average Processing Time was 119 days vs. 104 days in Qtr 3 of FY17.

Purchasing



	No.	TARGET	PERCENT IN TARGET
$0 - $500	648	3 DAYS	91.6%
$500 - $2K	739	7 DAYS	97.4%
$2K - $5K	417	10 DAYS	96.3%
$5K - $10K	67	25 DAYS	96.0%
$10K - $25K	73	30 DAYS	91.6%
$25K - $50K	10	60 DAYS	50.0%
Over $50K	26	90 DAYS	100.0%

The Purchasing Unit processed 1980 purchase orders, 83 less than the 2063 processed in Qtr 3 of FY17 for a total value of $10,080,673 versus a dollar value of $7,471,984 in Qtr 3 of FY17.

The purchase order processing target was not met for the $25K-$50K category due to staff summary requirements.

Contracts, Change Orders and Amendments

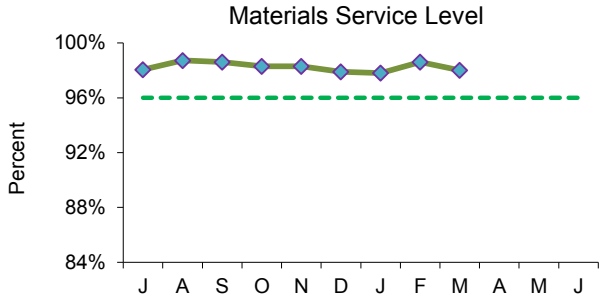
Four contracts were not processed within the target timeframes. The first contract was delayed during the pre-bid phase to respond to bidder questions and revise the contract documents. The second contract was delayed due to further analysis that was required of the proposals. The third contract was delayed due to a modification of the scope of the contract resulting in the re-submission and re-evaluation of cost proposals. The final contract was delayed as a result of additional time to review sub-bid results and the project cost estimate, as well as reprioritization of assignments by staff.

Procurement processed fifteen contracts with a value of $8,698,271 and eight amendments with a value of $2,275,731. Thirty seven change orders were executed during the period. The dollar value of all non-credit change orders during Q3 FY18 was $3,880,070 and the value of credit change orders was ($142,034).

Staff reviewed 70 proposed change orders and 56 draft change orders.

Materials Management

3rd Quarter - FY18



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,628 (97.9%) of the 7,768 items requested in Q3 from the inventory locations for a total dollar value of $1,408,834.

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 – gaskets, element filter and chiller for HVAC; copper wire, VFDs, UPS boards, UPS fan, voltage monitor and actuator for Electrical Shop; gearbox speed reducer for Power & Pump; MSA transmitter, laser transmitter and control module for I&C; stainless steel hinges and straps for Welding; butterfly valves for Residuals.
- Chelsea – airbag retainer, airbag sensor, plow blade edge, backhoe flip pad, vehicle mirrors and filters for Fleet Services; speed squares, 1/4 HP and 5 HP motor for Work Coordination; grit pipe for Mechanics; depth sensor, installation kits and ABS processor for Metering.
- Southboro – knit hats and ice melt for B&G; gloves and anti-seize for Equipment Maintenance; rust remover, re-activation heater and copier toner for Carroll Water Treatment Plant.

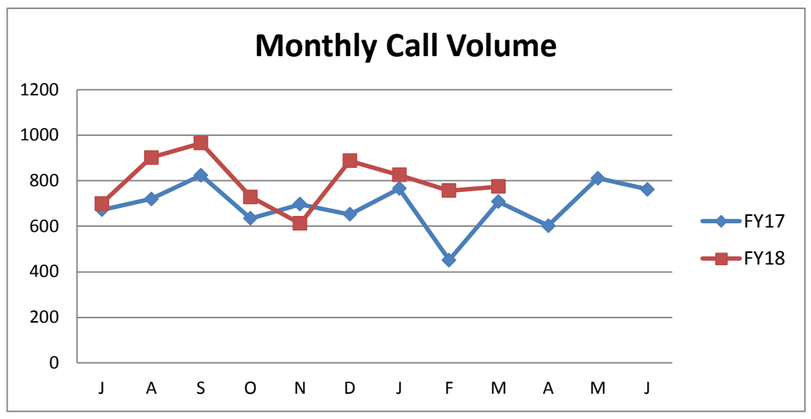
Property Pass Program:

- Four audits were conducted during Q3.
- Scrap revenue received for Q3 amounted to $20,873. Year to date revenue received amounted to $50,464.
- Revenue received from online auctions held during Q3 amounted to $29,260. Year to date revenue received amounted to $157,795.

Items	Base Value July-17	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,292,452	8,234,547	-57,905
Spare Parts Inventory Value	8,939,710	8,933,891	-5,819
Total Inventory Value	17,232,162	17,197,479	-34,683

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.

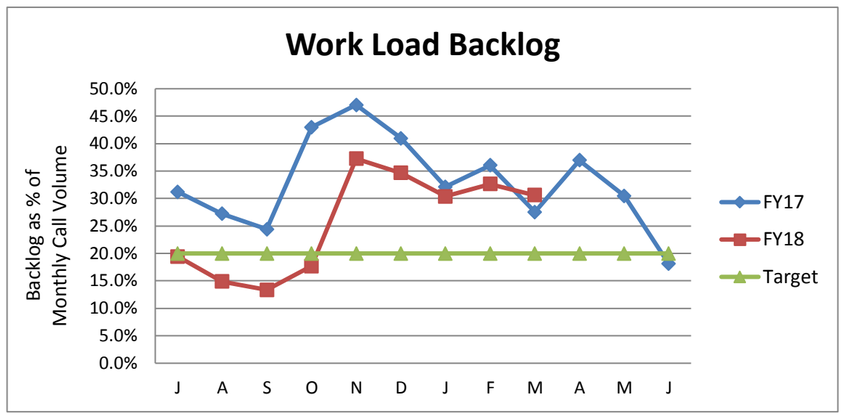
MIS Program
3rd Quarter - FY18

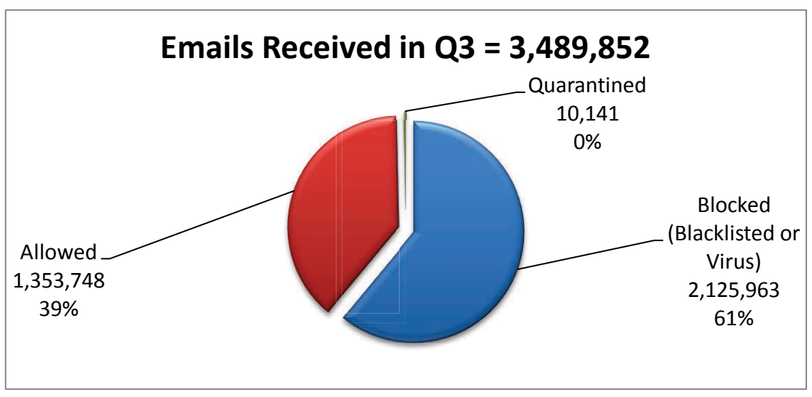


Performance & Backlog

Call Volume: Peaked in January. FY18-Q3 call volume increased by 22% from FY17-Q3.

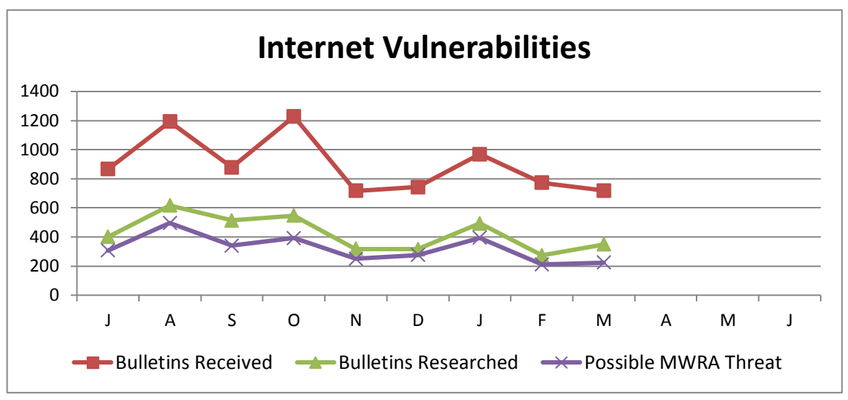
Call Backlog: Peaked in January. FY18-Q3 backlog average is 11% above targeted benchmark of 20%.





Information Security

In Q3, pushed security fixes/ updates to desktops/servers protecting against 488 vulnerabilities. McAfee Antivirus quarantined 8 distinct viruses from 8 PCs. PCs are current with antivirus



Infrastructure:

Desktop Refresh: Base image created and being tested in preparation for the desktop refresh scheduled in FY19. Windows 10 application compatibility being compiled.

Server Virtualization: New hardware implemented in CNY. Two servers migrated; balance to be completed in May.

Server Backup Solution Replacement: Continued work with vendor on system tuning.

Citrix Secure Application Migration: All iOS devices have been migrated to receive Citrix applications from the Apple Store.

Information Security Program: 93% of staff have completed the Security Awareness training.

Applications/Library & Records Center/Training:

Enterprise Content Management (ECM)/e-Construction: Participated in a presentation for MWRA Senior Management proposing that a solution be identified and procured to address Enterprise Content and Document Management initiative. Staff Summary was approved by the BOD at the March meeting. Work will proceed to identify a product and vendor to start implementation in the fall. Drafted a Project Overview and Charter.

Maximo: Went live with new Maximo 7.6 which included the IBM Control Desk module. Retested and reviewed operational status of all Maximo reports in the production environment. Successful testing of all Maximo-Lawson interfaces.

PIMS: Upgraded the WebSMR application and went live with latest specifications for Oracle, .Net, Crystal reports, and SSL.

Electronic Library Notebook: ELN Thermometer Version 2 items/modules implemented in production. There are a total of 19 ELN log books in production presently. Effort under way to add new features and redefine work processes. Began diagramming current and future work processes including supervisor/review process, DEP Historic Audit process including microbiology audit checklist.

Telog: The new application went live and is now hosted on virtual server giving IT the ability to back up and restore data in the event of failure. Additionally, the new database is in a SQL cluster environment which provides redundancy.

AVL: A new console application was installed giving users the ability to download and format vehicle odometer data from the Network fleet web site so that relevant data can be imported into Maximo on a weekly basis.

Portia-Lawson Interface: Went live with the Portia-Lawson interface. This interface allows Finance/Treasury users to post Variable Interest, Change in Market Value, and Long Term Interest from Portia into the Lawson GL accrual system.

DCR Water Quality System Upgrade: The Department of Conservation and Recreation (DCR) Water Quality System project is to upgrade the portal that exposes water quality data from both the Quabbin and Wachusetts reservoirs. The existing OMMS DCR application is being rebuilt using current technology and will provide additional data types for user viewing. Functional requirements have been completed and endorsed by the Water Quality Assurance department.

Library & Records Center: The Library fulfilled 69 research requests and provided 191 periodicals, standards, books, and reports. Research topics included potential dam failure, computer modeling for water distribution, dehydration of glycerol to acrolein, water monitoring-contamination, effect of BHP on copepod population, wetland locations in Southborough. The Records Center added 155 boxes (292 YTD) and handled 249 (630 YTD) boxes. Document searches included permits and shop drawings relating to Deer Island, Bellevue Standpipe #2, electrical supply agreement between BECO and MWRA, and Cottage Farm CSO.

IT Training: For the quarter, 45 staff attended 8 classes. 23% of the workforce has attended at least 1 class year-to-date. Cyber Security training sessions were held in Chelsea and Deer Island. A new instructor-led Intermediate Word 2016 – Mail Merge training class was completed and offered in support of Unit 1 Administrative Certificate Program (ACP).

Legal Matters
3rd Quarter FY 2018

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits:** Reviewed sixty-six (66) 8(m) permits. Drafted 8(m) permit for the March Fourth's use of certain MWRA land in the Fore River Shipyard.

- **Real Property**:
  Worked with MBTA to revise a draft permanent easement and license from MBTA for MWRA's use of certain MBTA land in Dedham related to MWRA's Section 111 water main project. Drafted license for the use of a portion of Deer Island real property by Harbor Electric Energy Company for the installation, operation, and maintenance of the new cross harbor electric distribution cable and related facilities and the decommissioning of the existing cross harbor electric distribution cable. Reviewed letter relative to the relocation of wireless equipment located at MWRA's Turkey Hill water storage tank in Arlington. Reviewed MWRA's and Fore River Railroad Corporation's property interest in Braintree relative possible encroachment by abutter. Recorded Certificate of Compliance for Order of Conditions DEP 297-0353 related to MWRA's Spot Tank Project Contract 6457. Recorded Extension Permit for Order of Conditions DEP 212-1132 related to MWRA's Wachusett Aqueduct Pump Station project in Marlborough. Drafted letter in response to claim related to a water main break on Hobbs Court in Arlington. Reviewed MWRA's property interests in the area of Farwell Street in Newton. Reviewed MWRA's property rights for its Section 4 water line in Norfolk Street in Cambridge and MWRA's option to request that certain utilities relocate their utilities which impede MWRA's ability to maintain its Section 4 water line in Norfolk Street pursuant to Section 9(b) of the enabling act. Drafted letter submitting the final three deliverables to MassDOT relative to MassDOT taking physical possession of the Commercial Point CSO Chemical Building which was transferred by MWRA to MassDOT in December 2017. Reviewed legislation relative to surplus of property rights at Squire Road in Revere. Reviewed rights relative to water pipe bridge on College Avenue Bridge in Medford. Reviewed and revised construction access license from the City of Boston to MWRA for maintenance on its water infrastructure.

- **NPDES:** Reviewed 2018 Joint Public Notice for Alewife Brook which is required by the Combined Sewer Overflow Variance for the Alewife Brook/Upper Mystic River Basin.

- **Public Access**: Drafted amendment to 8(m) permit for the Town of Weston for their use of portions of the Weston Aqueduct, Weston Reservoir, and Norumbega Reservoir located within the Town of Weston.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

Matters Concluded

Received an arbitrator's decision in favor of MWRA finding that the MWRA did not violate a collective bargaining agreement with respect to the job classification of Grievant's position.

LITIGATION/TRAC

New Matters There are no new lawsuits to report.

Significant Claims There are no new Significant Claims to report.

Significant Developments DaPrato v. MWRA, C.A. No. 2015 CV 3687 D: Prepared oppositions to DaPrato post-trial motions. Retained outside counsel to review appellate issues.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of March 2018	As of Dec 2017	As of Sept 2017
Construction/Contract/Bid Protest (other than BHP)	1	1	0
Tort/Labor/Employment	2	2	2
Environmental/Regulatory/Other	2	2	2
Eminent Domain/Real Estate	0	0	0
total – all defensive cases	**5**	**5**	**4**
Other Litigation matters (restraining orders, etc.) MWRA v. Thomas Mercer MWRA v. NSTAR and HEEC	2	2	2
total – all pending lawsuits	**7**	**7**	**6**
Claims not in suit: Thang Viet Vu and Oanh Vu Claim	1	2	3
Bankruptcy	2	2	2
Wage Garnishment	15	15	15
TRAC/Adjudicatory Appeals	1	1	1
Subpoenas	1	1	1
TOTAL – ALL LITIGATION MATTERS	**27**	**28**	**28**

Closed Cases There are no closed cases to report.

Closed Claims Joel Chiet MVA Claim: The Joel Chiet auto accident claim has settled for $60,000. Mr. Chiet, who is 83 years old, claims that on June 29, 2015, on the Fellsway in Medford, an MWRA vehicle collided with the rear of his vehicle when Mr. Chiet was stopped at a traffic light. Mr. Chiet's vehicle was damaged. Mr. Chiet also alleged that he sustained personal injuries as a result of the accident that required medical treatment, and affected his ability to work, and to care for his chronically ill wife.

Subpoenas During the Third Quarter of FY 2018, no new subpoenas were received and one subpoena was pending at the end of the Third Quarter FY 2018.

Public Records During the Third Quarter of FY 2018, twenty-four public records requests were received and eleven public records requests were closed.

TRAC/MISC.

New Appeals: No new TRAC Appeals.

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

Stipulation of Dismissal No Joint Stipulation of Dismissals filed.

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

Tentative Decision There are no Tentative Decisions issued in the 3rd Quarter FY 2018.

Final Decisions There are no Final Decision issued in the 3rd Quarter FY 2018.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
3rd Quarter - FY18

Highlights
During the 3rd Quarter FY18, IA completed a review of the Uniform Debit Card program. The objective was to determine compliance with existing policies and procedures and good business practices. Recommendations included developing a more comprehensive policy, correcting coding, reviewing the accuracy of the upload list each year, determine the need to reload cards with no activity and to improve segregation of duties. Three recommendations were closed prior to the final report being issued.

Other assignments completed include contract amendment negotiation support, a review of allowances under design contracts, HEEC billing adjustments for 2018 and participation in the consultant contract task force.

Status of Recommendations
During FY18, a total of 21 recommendations were closed, of which 18 were from prior fiscal years' audits.

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

Report Title (issue date)	Audit Recommendations		
	Open	Closed	Total
Unmatched Receipts and Accruals (6/30/15)	2	8	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)	3	10	13
Purchase Card Activity on Deer Island (3/31/17)	3	12	15
Review of Uniform Debit Card Program (3/30/18)	3	3	6
Total Recommendations	***14***	***67***	***81***

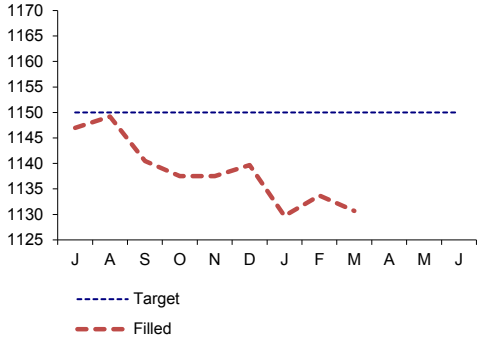
Cost Savings
IA's target is to achieve at least $1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

Cost Savings	FY14	FY15	FY16	FY17	FY18 Q3	TOTAL
Consultants	$294,225	$87,605	$88,312	$272,431	$77,275	$819,848
Contractors & Vendors	$415,931	$1,146,742	$1,772,422	$3,037,712	$948,015	$7,320,822
Internal Audits	$923,370	$543,471	$220,929	$224,178	$153,239	$2,065,187
Total	**$1,633,526**	**$1,777,818**	**$2,081,663**	**$3,534,321**	**$1,178,529**	**$10,205,857**

OTHER MANAGEMENT

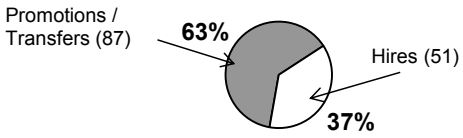
Workforce Management
3rd Quarter - FY18

FTE Tracking



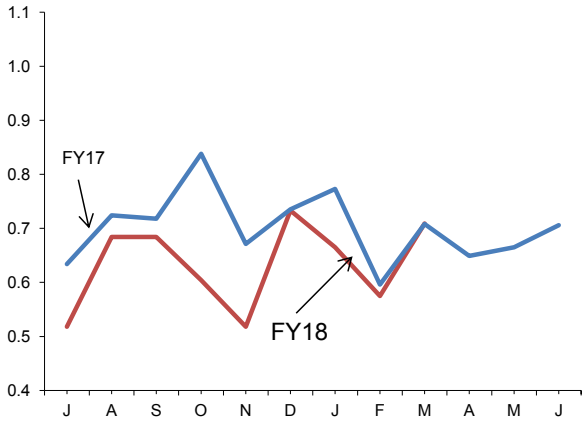
FY18 Target for FTE's = 1150
FTE's as of MAR 2018 = 1130.7

Positions Filled by Hires/Promotions
FY18-YTD



	Pr/Trns	Hires	Total
FY16	99 (62%)	60 (38%)	159
FY17	155 (68%)	72 (32%)	227
FY18	87(63%)	51 (37%)	138

Average Monthly Sick Leave Usage
Per Employee

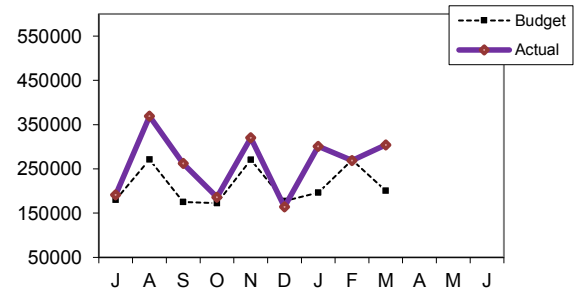


Average monthly sick leave thru the 3rd Quarter of FY18 decreased as compared thru FY17 (7.51 to 8.41 days)

	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY17
Admin	134	4.89	6.52	13.4%	7.75
Aff. Action	6	5.69	7.59	9.9%	6.28
Executive	5	3.07	4.09	24.3%	13.80
Finance	34	4.37	5.82	0.0%	8.50
Int. Audit	7	4.39	5.85	39.3%	6.51
Law	14	4.79	6.39	8.9%	8.98
OEP	8	2.04	2.72	0.0%	5.74
Operations	926	5.60	7.47	17.3%	8.55
Pub. Affs.	13	9.33	12.44	73.0%	6.31
MWRA Avg	**1147**	**3.79**	**7.59**	**17.8%**	**8.42**

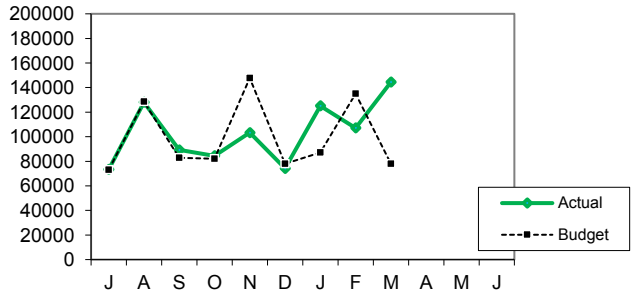
Percent of sick leave usage for FY18, attributable to Family and Medical Leave Act (FMLA) is 17.8% .

Field Operations
Current Month Overtime $



Total Overtime for Field Operations for the second quarter of Total Overtime for Field Operations for the third quarter of FY 2018 was $869,742 which is $202k over budget. Emergency overtime was $555k, which was $205k over budget, the majority of which was for snow removal and rain events. Coverage overtime was $146k, which was $6k over budget, reflecting the month's shift coverage requirements. Planned overtime was $169k or ($9k) under budget, mainly for planned operations and half plant at Carroll. YTD, FOD has spent $2,366,620 on overtime which is $453k over budget.

Deer Island Treatment Plant
Current Month Overtime $

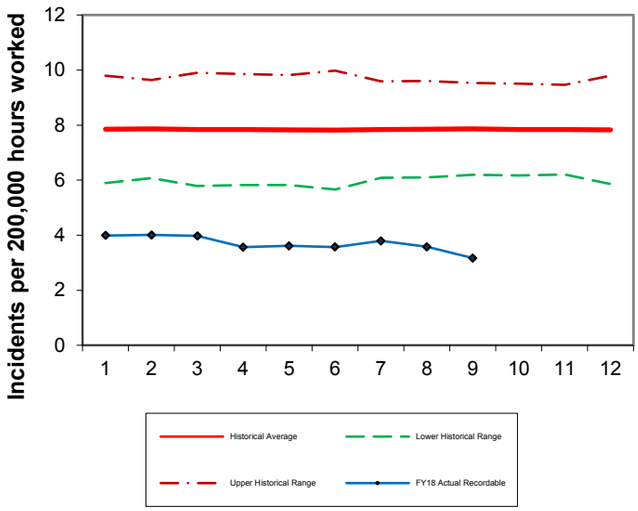


Deer Island's total overtime expenditure in the third quarter FY 2018 was $376k, which was $76k over budget. Storm coverage, for the 3rd quarter was over by $45k, primarily due to major snow and rain events. The Maintenance underspending of ($23k) in the winter months of January & February helped to offset the significant overage in March of $44k for storm coverage. YTD, Deer Island has spent $929,121 on overtime which is $37k over budget.

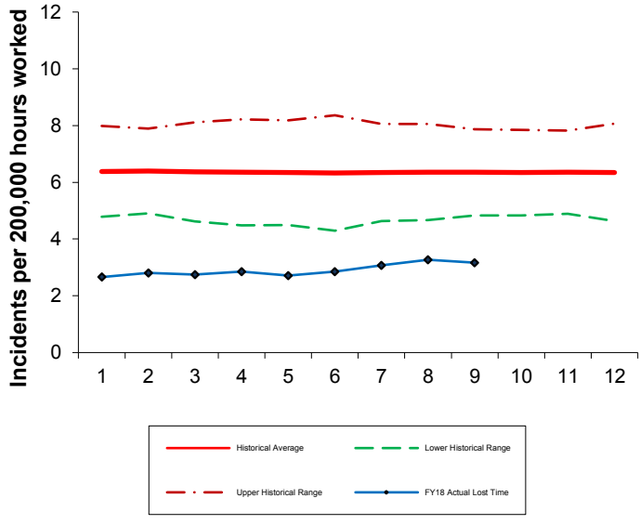
Workplace Safety

3rd Quarter - FY18

Recordable Injury & Illness Rates



Lost Time Injury & Illness Rates



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

	3rd Quarter Information		
	New	**Closed**	**Open Claims**
Lost Time	10	22	63
Medical Only	19	19	16
Report Only	13	13	
	QYTD		**FYTD**
Regular Duty Returns	6		21
Light Duty Returns	1		2

COMMENTS:

Regular Duty Returns

JAN 3 employees' returned to Full Duty, no restrictions
FEB 2 employee's returned to Full Duty, no restrictions
MARCH 1 employee returned to Full Duty, no restrictions

Light Duty Returns

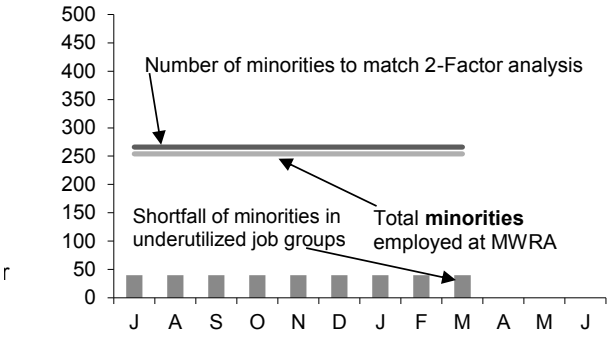
JAN 1 employee returned to Light Duty from workers' compensation
FEB No employees returned to Light Duty from workers' compensation
MARCH No employees returned to Light Duty from workers' compensation

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.

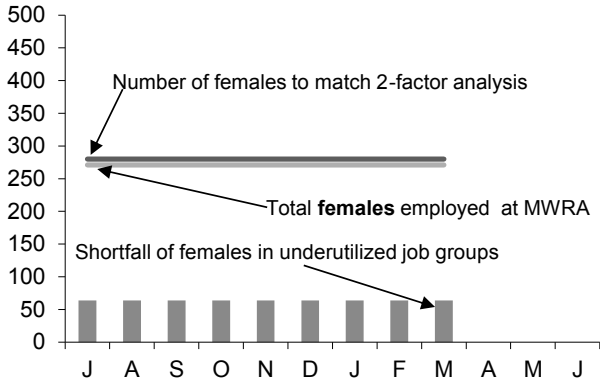
MWRA Job Group Representation

3rd Quarter - FY18

Minority - Affirmative Action Plan Goals



Female - Affirmative Action Plan Goals



Highlights:

At the end of Q3 FY18, 9 job groups or a total of 44 positions are underutilized by minorities as compared to 9 job groups or a total of 41 positions at the end of Q3 FY17; for females 7 job groups or a total of 62 positions are underutilized females as compared to 7 job groups or a total of 52 positions at the end of Q3 FY17. During Q3, 5 minorities and 2 females were hired. During this sam e period 5 minorities and 6 females terminated. **Effective February , 2017, The Board of Directors approved the 2018 Affirmative Action's workforce goals. The new goals are the following: minorities 25.1 % and females 24.3%.**

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 3/31/2017	Minorities as of 3/31/2017	Achievement Level	Minority Over or Under Underutilized	Females As of 3/31/2017	Achievement Level	Female Over or Under Underutilized
Administrator A	21	2	3	-1	8	7	1
Administrator B	21	1	4	-3	4	3	1
Clerical A	31	11	7	4	27	21	6
Clerical B	27	9	7	2	10	10	0
Engineer A	78	26	17	9	18	16	2
Engineer B	56	14	11	3	12	7	5
Craft A	113	17	41	-24	1	4	-3
Craft B	145	24	43	-19	3	4	-1
Laborer	66	18	14	4	2	2	0
Management A	102	16	25	-9	37	40	-3
Management B	46	9	8	1	9	4	5
Operator A	68	4	14	-10	0	6	-6
Operator B	66	15	16	-1	4	21	-17
Professional A	31	5	8	-3	19	15	4
Professional B	159	46	38	8	79	58	21
Para Professional	60	18	20	-2	31	47	-16
Technical A	52	13	11	2	6	11	-5
Technical B	6	2	1	1	1	1	0
Total	**1148**	**250**	**288**	**28/-44**	**271**	**277**	**61/-62**

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotion s/Transfers	AACU Ref. External	Position Status
Management A	Manager Compensation	1	Ext	Ext	0	NH=WF
Craft A	Valve Maintenance Foreman	1	Int	Int	0	Promo =WM
Craft A	WSS Foreman	1	Int	Int	0	Promo = HM
Craft B	Heavy Equipment Operator 1	1	Int	Int	0	Promo = WM
Craft A	M&O Specialist	1	Ext	Ext	0	NH = WM
Craft B	Jr. Instrument Technician	1	Int/Ext	Int	0	NH=WM
Craft B	Electrician	1	Ext	Ext	0	NH = WM
Craft B	Plumber/Pipefitter	3	Ext	Int	0	NH = (3)WM, TR=WM
Engineer B	Project Manager, SCADA Engineering	1	Int	Int	0	Promo = WM
Operator A	Supervisor, Facility Maintenance	1	Int	Int	0	Promo = WM
Operator A	Transmission & Treatment Operator	1	Ext	Ext	0	Promo = WM
Operator B	Operator	1	Int	Int	0	Promo = BM
Professional B	Sr. Staff Counsel	1	Int	Int	0	Promo = WF
Technical B	Systems Administrator II	1	Ext	Ext	0	Promo = AM
Technical A	Sr. Draftperson	1	Ext	Ext	0	NH= WF
Technical A	Sr. Instrument Technician	1	Int	Int	0	Promo (2) = HM, BM

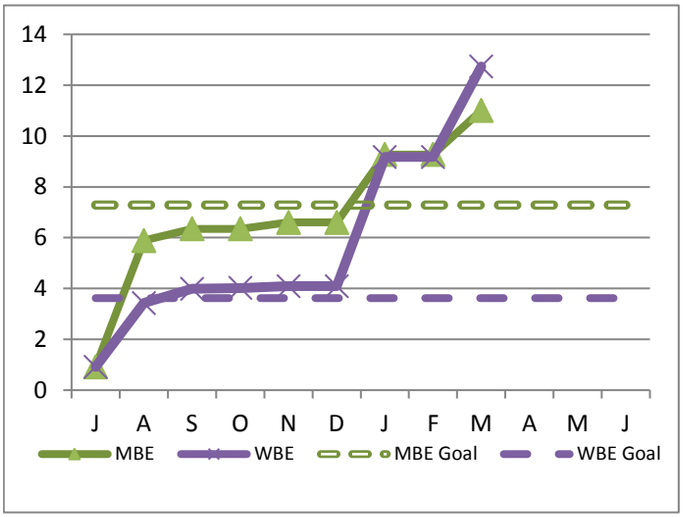
MBE/WBE Expenditures

3rd Quarter - FY18

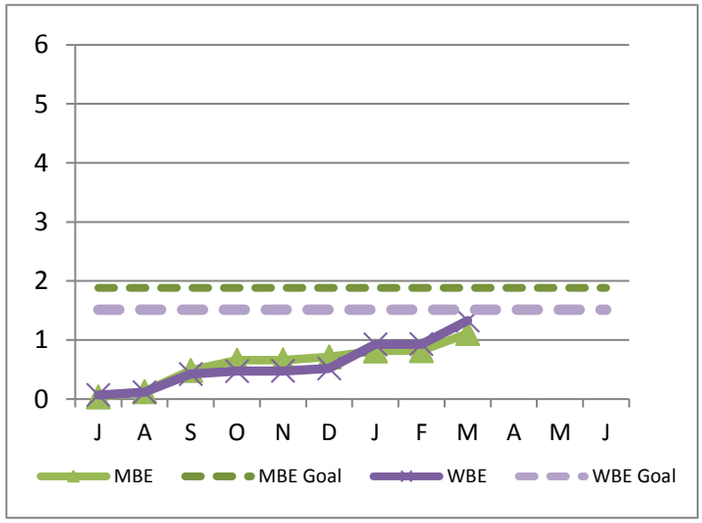
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY18 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they 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.

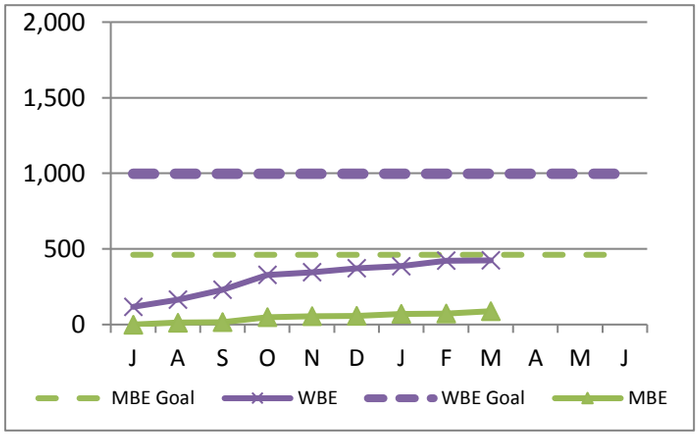
Construction



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
11,002,658	151.1%	5,628,738	99.5%	Construction	12,734,812	351.6%	3,690,334	131.3%
1,110,210	58.9%	920,597	162.8%	Prof Svcs	1,329,118	87.8%	533,917	117.5%
88,259	19.1%	179,359	29.8%	Goods/Svcs	424,272	42.5%	1,553,214	181.6%
12,201,127	126.7%	6,728,694	98.6%	**Totals**	14,488,202	236.2%	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 FY18 CEB Expenses
3rd Quarter – FY18

As of March 2017, total expenses are $521.7 million, $5.2 million or 1.0% lower than budget, and total revenue is $563.6 million, $6.0 million or 1.2% over budget, for a net variance of $11.2 million.

Expenses –

Direct Expenses are $159.6 million, $5.5 million or 3.3% below budget.

- **Wages & Salaries** are under budget by $2.5 million or 3.3%. Regular pay is $2.4 million under budget, due to lower head count, and timing of backfilling positions. At the end of March, the average Full Time Equivalent (FTE) positions were 1,140, ten fewer than the 1,150 FTE's budgeted.
- **Maintenance** expenses are $1.9 million or 8.4% under budget due mostly to timing of projects such as the HVAC upgrades at the Braintree/Weymouth Pump Station and door replacements and PICS System upgrades at Deer Island.
- **Fringe Benefits** expenses are $636k or 4.2% under budget, primarily for lower Health Insurance costs of $506k due to fewer employees and retirees than budgeted participating in health insurance plans, and the shift from family to individual plans which are less expensive.
- **Worker's Compensation** expenses are $313k or 18.0% under budget, primarily due to settlement of five claims and resolution of a few other claims through return to work resulting in compensation reserves adjustments and lower medical payments.
- **Chemicals** are $337k or 4.6% under budget due to lower flows at the Deer Island Wastewater Treatment Plant and the Carroll Water Treatment Plant and timing of deliveries: Soda Ash by $302k reflecting lower flows and higher natural pH at CWTP, and Activated Carbon by $96k due to timing, partially offset by over spending of $296k for Hydrogen Peroxide due to the lower flows at DI and overspending of $111k for Ferric Chloride also at Deer Island.
- **Overtime** expenses are $458k over budget or 14.8% due to recent wet weather events and snow removal, and off-hours maintenance earlier in the fiscal year.
- **Other Materials** expenses are $243k or 7.7% under budget due to lower expenses for Health and Safety materials at DITP and lower Vehicle Expenses due to lower than budgeted fuel prices.
- **Professional Services** expenses are $142k or 2.8% under budget due to timing of Engineering Services in Operations and Legal Services in Administration and Treasury.

Indirect Expenses are $26.4 million, $256k over budget or 1.0% reflecting insurance claims over budget by $764k due to a litigation loss accrual partially offset by lower Watershed Reimbursement of $336k due to a year-end over accrual at the end of FY17 and lower than budgeted HEEC cable O&M of $124k.

Debt Service Expenses totaled $335.6 million, matching the budgeted level after the transfer of $7.0 million to the Defeasance Account. Of the $7.0 million transferred to the Defeasance Account, $6.0 million represents year to date savings due to lower than budgeted variable interest rates.

	March 2018 Year-to-Date			
	Period 9 YTD Budget	Period 9 YTD Actual	Period 9 YTD Variance	%
EXPENSES				
WAGES AND SALARIES	$ 74,439,029	$ 71,958,893	$ (2,480,136)	-3.3%
OVERTIME	3,106,092	3,564,537	458,445	14.8%
FRINGE BENEFITS	15,295,308	14,659,003	(636,305)	-4.2%
WORKERS' COMPENSATION	1,742,235	1,428,823	(313,412)	-18.0%
CHEMICALS	7,262,253	6,924,888	(337,365)	-4.6%
ENERGY AND UTILITIES	15,678,124	15,815,947	137,823	0.9%
MAINTENANCE	22,346,921	20,462,864	(1,884,057)	-8.4%
TRAINING AND MEETINGS	306,499	223,326	(83,173)	-27.1%
PROFESSIONAL SERVICES	5,053,301	4,911,417	(141,884)	-2.8%
OTHER MATERIALS	3,175,017	2,931,869	(243,148)	-7.7%
OTHER SERVICES	16,689,484	16,725,586	36,102	0.2%
TOTAL DIRECT EXPENSES	**$ 165,094,263**	**$ 159,607,153**	**$ (5,487,108)**	**-3.3%**
INSURANCE	$ 1,510,089	$ 2,287,857	$ 777,768	51.5%
WATERSHED/PILOT	18,873,005	18,497,235	(375,770)	-2.0%
HEEC PAYMENT	718,084	589,153	(128,931)	-18.0%
MITIGATION	1,197,713	1,181,168	(16,545)	-1.4%
ADDITIONS TO RESERVES	615,837	615,837	-	0.0%
RETIREMENT FUND	3,277,369	3,277,369	-	0.0%
POST EMPLOYEE BENEFITS	-	-	-	---
TOTAL INDIRECT EXPENSES	**$ 26,192,097**	**$ 26,448,619**	**$ 256,521**	**1.0%**
STATE REVOLVING FUND	$ 61,488,764	$ 60,478,403	$ (1,010,361)	-1.6%
SENIOR DEBT	195,795,201	195,795,201	-	0.0%
CORD FUND	-	-	-	---
DEBT SERVICE ASSISTANCE	(391,580)	(391,580)	-	0.0%
CURRENT REVENUE/CAPITAL	9,900,000	9,900,000	-	0.0%
SUBORDINATE MWRA DEBT	63,569,637	63,569,637	-	0.0%
LOCAL WATER PIPELINE CP	2,846,208	2,846,208	-	0.0%
CAPITAL LEASE	2,412,795	2,412,795	-	0.0%
DEBT PREPAYMENT	-	-	-	---
VARIABLE DEBT	-	(6,000,566)	(6,000,566)	---
HEEC CABLE CAPACITY RESERV	-	-	-	---
DEFEASANCE ACCOUNT	-	7,010,927	7,010,927	---
TOTAL DEBT SERVICE	**$ 335,621,025**	**$ 335,621,025**	**$ -**	**0.0%**
TOTAL EXPENSES	**$ 526,907,385**	**$ 521,676,796**	**$ (5,230,585)**	**-1.0%**
REVENUE & INCOME				
RATE REVENUE	$ 537,790,500	$ 537,790,500	$ -	0.0%
OTHER USER CHARGES	6,640,935	6,595,589	(45,346)	-0.7%
OTHER REVENUE	6,025,393	10,839,195	4,813,802	79.9%
RATE STABILIZATION	-	-	-	---
INVESTMENT INCOME	7,155,416	8,383,504	1,228,088	17.2%
TOTAL REVENUE & INCOME	**$ 557,612,244**	**$ 563,608,788**	**$ 5,996,544**	**1.1%**

Revenue and Income –

Total Revenue and Income is $563.6 million, $6.0 million higher than budget, primarily due to a $4.2 million LIBOR settlement from Barclays Bank PLC. Revenues were also over budget by $1.2 million for favorable returns on investment income, $228k for the final payment of a class action lawsuit settlement for derivative agreements, and $225k for disposal of surplus material.

Cost of Debt
3rd 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.

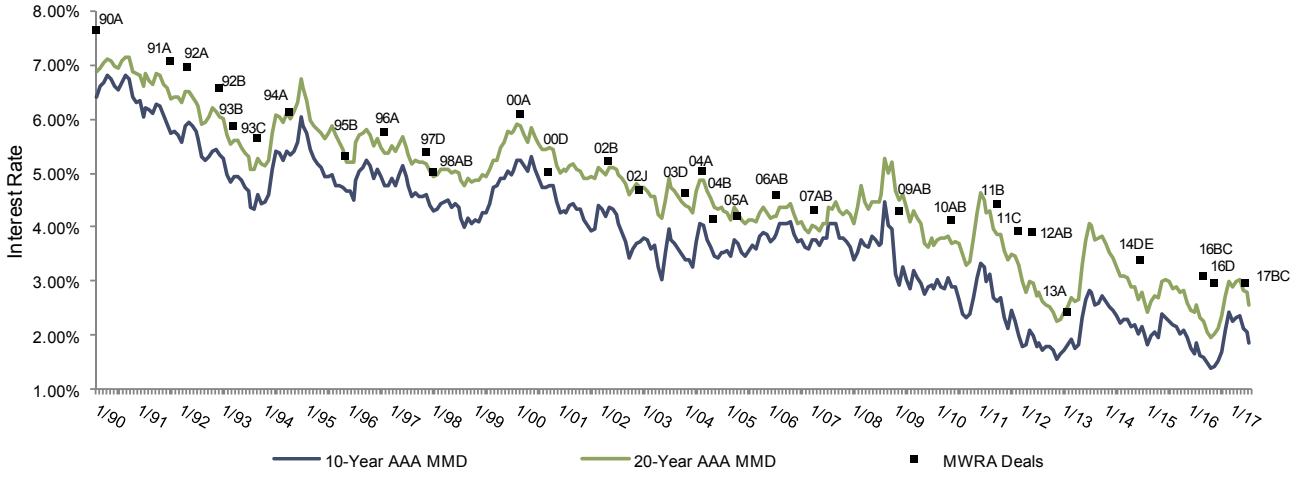
Average Cost of MWRA Debt FYTD

Fixed Debt ($3,487)	3.81%
Variable Debt ($464.1)	1.42%
SRF Debt ($942.8)	1.42%
Weighted Average Debt Cost ($5,043)	3.13%

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

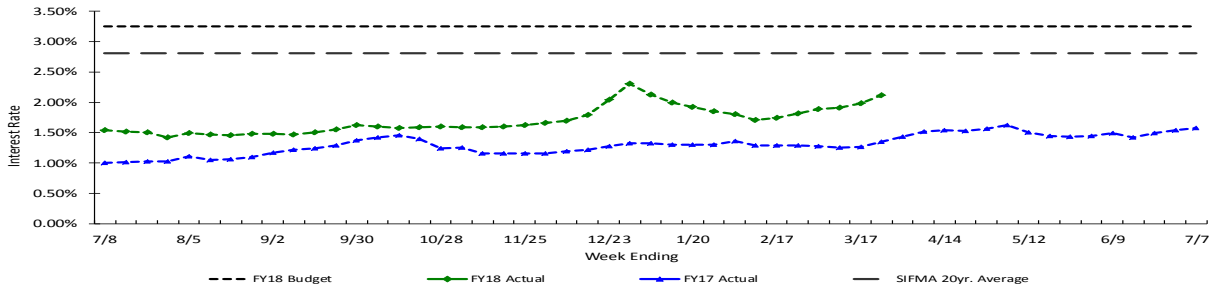


Bond Deal	1992B	1993B	1993C	1994A	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A
Rate	6.58%	5.89%	5.66%	6.15%	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%
Avg Life	6.3 yrs	19.8 yrs	19.1 yrs	19.5 yrs	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4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

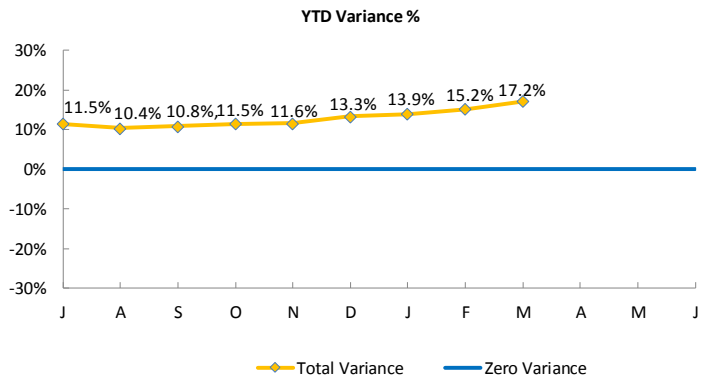
MWRA currently has ten variable rate debt issues with $831.4 million outstanding, excluding commercial paper. Of the ten outstanding series, five have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In March, SIFMA rates ranged from a high of 1.58% to a low of 1.09% 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

3rd Quarter - FY18

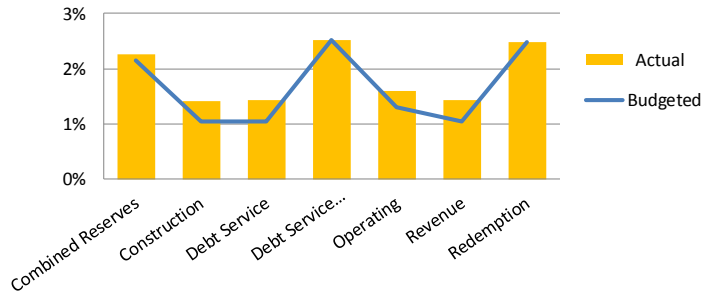
Year To Date



	YTD BUDGET VARIANCE ($000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	$1	$50	51	5.1%
Construction	$84	$181	265	53.6%
Debt Service	$26	$426	452	39.6%
Debt Service Reserves	$0	$5	5	0.2%
Operating	($18)	$87	69	10.9%
Revenue	$128	$257	384	59.8%
Redemption	$0	$1	1	0.3%
Total Variance	$221	$1,007	$1,228	17.2%

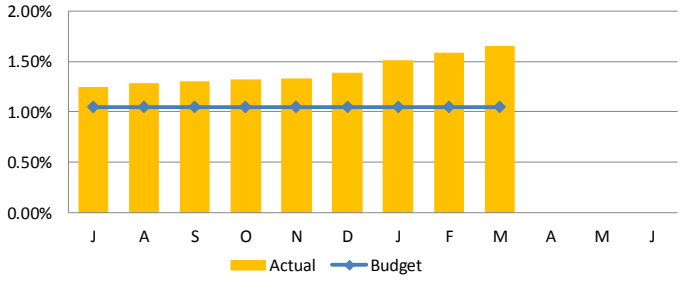
YTD Average Balances Budgeted vs. Actual

YTD Average Interest Rate Budgeted vs. Actual

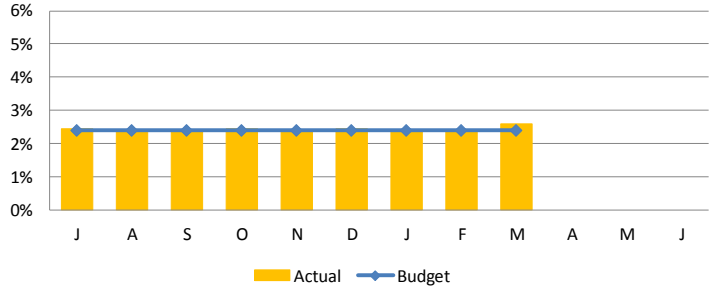


Monthly

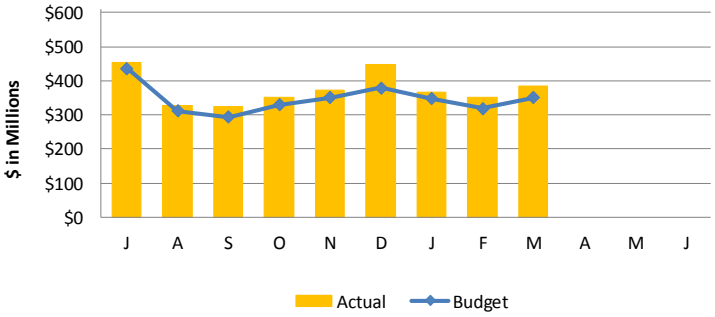
Short -Term Interest Rates



Long -Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances