

MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report
On
Key Indicators of MWRA Performance
For
Third Quarter FY2017

Q1	Q2	Q3	Q4

Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer
June 7, 2017

Board of Directors Report on Key Indicators of MWRA Performance

Third Quarter FY17

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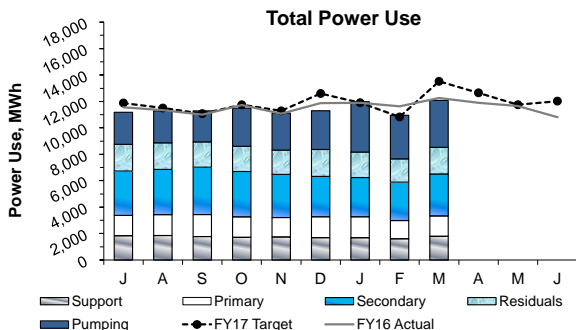
This quarterly report is prepared by MWRA staff to track a variety of MWRA performance measures for routine review by MWRA's board of directors. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for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

Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer
June 7, 2017

OPERATIONS AND MAINTENANCE

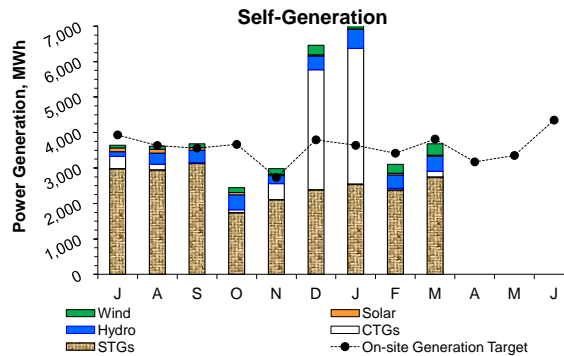
Deer Island Operations

3rd Quarter - FY17

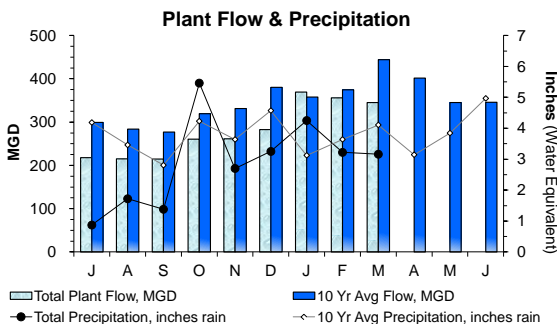


Total power usage in the 3rd Quarter was 3.4% below target as Total Plant Flow was 1.3% below target with the 3 year average plant flow. Power used in all plant processes were below their individual targets for the quarter. Power used in wastewater pumping operations was 6.1% below target.

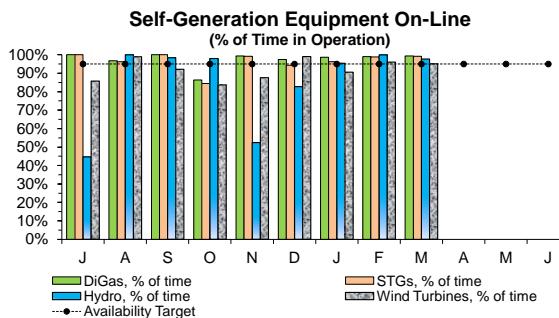
Note: Power usage projections are based on 3 year averages.



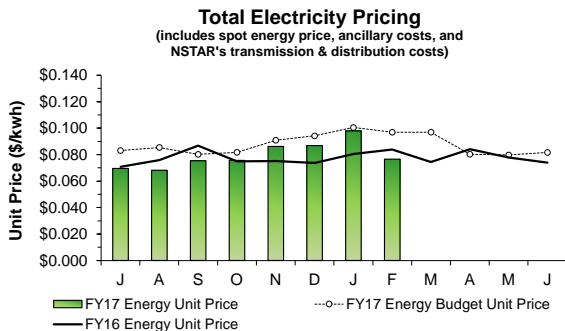
Power generated on-site during the 3rd Quarter was 28.5% above target. While generation by the STGs and Wind Turbines exceeded their targets, generation by the Hydro Turbines was 21% below target as a result of lower than expected plant flow and a vibration issue which prevented staff from operating the turbines at design capacity. The CTGs generated five (5) times more power than expected during the quarter as the cross harbor electrical cable, that supplies the primary source of power to Deer Island, was de-energized for much of January to allow Eversource to safely perform cable location and dredging work (Phase 1A and 1B of Eversource/HEEC cable location and protection project). Therefore, CTG operation was needed to meet the electrical needs of the treatment plant during this work.



Total Plant Flow for the 3rd Quarter was 9.0% below target with the 10 year average plant flow (356.8 MGD actual vs. 392.1 MGD expected) as precipitation for the quarter was 2.2% lower than target (10.63 inches actual vs. 10.87 inches expected).

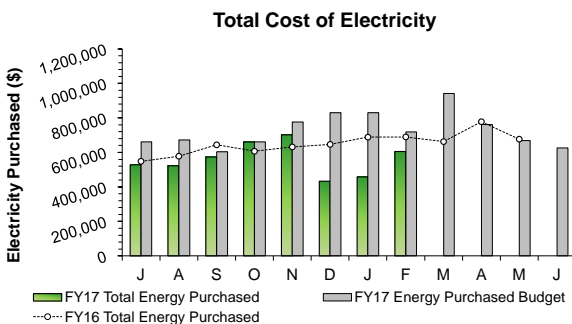


The DiGas system, STGs, and Hydro Turbines met the 95% availability target for the 3rd Quarter. Wind Turbine availability fell just below target by 1.1%. Turbulence caused by wind blowing through the digesters resulted in the wind turbines tripping offline and reducing their availability until the wind direction shifted.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Price in the 3rd Quarter (actuals for January and February only) was 11.6% lower than the FY17 budget estimate for the same period. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

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

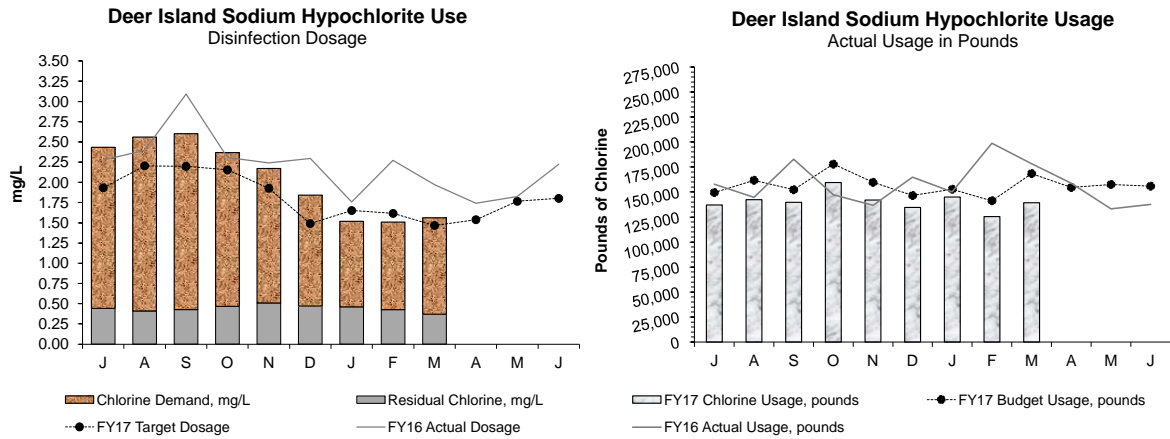


The total cost of Electricity Purchased during the 3rd Quarter (actuals for January and February only) was 31.3% lower than budget. Total Electricity Purchased in January alone was 43.4% lower than budgeted as the cross harbor electrical cable, that supplies the primary source of power to Deer Island, was de-energized for much of the month to allow Eversource to safely perform cable location and dredging work (Phase 1A and 1B of Eversource/HEEC cable location and protection project). Therefore, CTG operation, and not Purchased Electricity, was used to meet the electrical needs of the treatment plant. Year-to-date costs are \$1,240,388 lower than budgeted through February as both the Total Energy Unit Price and the Total Electricity Purchased are approximately 10% lower than budgeted through February. The cost data for Electricity Purchased in March is not yet available as of reporting time.

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

Deer Island Operations

3rd Quarter - FY17



The disinfection dosing rate in the 3rd Quarter was within 3% of the target. DITP maintained an average disinfection chlorine residual of 0.42 mg/L this quarter with an average dosing rate of 1.53 mg/L (as chlorine demand was 1.11 mg/L). Actual sodium hypochlorite usage in pounds of chlorine was 11.4% below target this quarter due to the lower than expected plant flow.

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

Secondary Blending Events

Month	Count of Blending Events	Count of Blending Events Due to Rain	Count of Blending Events Due to Non-Rain-Related Events	Secondary, as a Percent of Total Plant Flow	Total Hours Blended During Month
J	0	0	0	100.0%	0.00
A	0	0	0	100.0%	0.00
S	0	0	0	100.0%	0.00
O	2	2	0	99.7%	3.94
N	2	2	0	99.7%	4.50
D	1	1	0	99.9%	2.30
J	2	2	0	99.7%	8.62
F	0	0	0	100.0%	0.00
M	2	2	0	99.4%	8.54
A					
M					
J					
Total	9	9	0	99.8%	27.91

99.7% of all flows were treated at full secondary during the 3rd Quarter. There were a total of four (4) separate secondary blending events; all due to high plant flow resulting from heavy rain. The four (4) combined blending events resulted in a total of 17.17 hours of blending and 91.21 Mgal of flow blended with secondary effluent. 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 a peak instantaneous flow rate of 1,037.2 MGD on the morning of April 1 (occurring on the last reporting day of the month which ended at 8:00 a.m. on April 1). This peak flow occurred during a two (2) day rain event that produced 2.43 inches of precipitation. For this rain event, the actual peak flow of 1,238 MGD occurred at 12:13 p.m. on April 1. Overall, Total Plant Flow in the 3rd Quarter was 9.0% below the 10 year average plant flow target for the quarter.

Essential maintenance and rehabilitation activities involving the replacement of butterfly flow control valves, discharge isolation valves, flow meters, and associated piping for each of the 10 wastewater pumps in the North Main Pump Station (NMPS) continued in Quarter 3. All equipment is original and dates back to the facility upgrades in 1995. Over time, the valves in these facilities have sustained damage from age and wear and must be replaced to allow proper isolation of pumps and equipment for maintenance. There were a total of eight (8) force main isolation events during the third quarter of FY17, to install the new equipment for Pump #3, to remove and install the new equipment for Pumps #5, #6 and #8, and to remove the old equipment for Pump #2. NMPS, Winthrop Terminal Headworks Facility, and South System Pump Station continued to operate during these events.

The replacement program for the Deer Island to pellet plant pumps system has begun. The first of the new centrifugal pumps was installed in February and performance testing of this new pump in operation began in early March. The overall performance of this new pump has been successful allowing for the removal of the remaining two (2) Abel sludge pumps to proceed.

Deer Island Operations

3rd Quarter - FY17

Deer Island Operations & Maintenance Report (continued)

Energy and Thermal Power Plant:

Overall, total power generated on-site accounted for 39.9% of Deer Island's total power use for the 3rd Quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 28.4% of Deer Island's total electrical power use for the quarter. Wind Turbine generation was 13% higher than target for the quarter, and nearly twice its generation target in March. The daily Wind Turbine generation on two (2) days in March fell within the Top 20 list for highest daily Wind Turbine generation.

Eversource and its subsidiary Harbor Electric Energy Company ("HEEC") is currently undertaking a project to more precisely locate the depth of the Reserved Channel portion of HEEC's 115kV power line which is used to provide primary power to the DITP. The HEEC project consists of Phase 1 and Phase 2. Phase 1 consists of precisely locating the cable in the Reserved Channel. Phase 2 will involve dredging and installing protective mats over the 1,200 foot section of cable in the Reserved Channel, currently planned for the summer of 2017. The cable must be de-energized to safely carry out this work, therefore DITP will be isolated from the grid and operate using backup CTG(s) power.

The first part of Phase 1 work, determining coordinates of the cable location, occurred from November 2 to November 5 and required a CTG to be operated from approximately 6:00 a.m. to 7:00 p.m. each day while the cable was de-energized. The second part of Phase 1, which began on December 8 and continued through completion on January 22, involved test pit dredging to verify the location of the cable. This phase of the work, also required Eversource to de-energize the cable leaving DITP off the grid and operating on CTG power. The CTGs were operated for various periods of time on 18 days in January for this portion of the work.

DITP took delivery of 405,000 gallons of #2 fuel oil (a total of 45 tanker trucks) without incident over the course of ten (10) days in January. This fuel oil is used for CTG operation, for boiler startup operations, and for supplemental fuel for boiler operation during periods of low or unstable digester gas production.

Opacity testing for each CTG unit was successfully completed on March 22 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 hour. During this time a certified "smoke reader" visually observes the condition of the stack exhaust and records the results.

The quarterly Continuous Emissions Monitoring System (CEMS) cylinder gas audits, along with the annual and quarterly Continuous Opacity Monitoring System (COMS) audits for the two (2) boilers in the Thermal Power Plant were successfully completed by contractors on March 21. The CEMS measures the nitrogen oxides (NOx) emissions, the oxygen, carbon monoxide, and sulfur dioxide concentrations in the boiler flue gas. The cylinder gas audit measures each gas analyzer in the CEMS against known cylinder gas concentrations. The opacity audits measure the performance of the COMS through a number of required testing protocols specified in the regulations. DITP received passing results on all the audit tests that were performed and a draft report will be issued by the contractors for staff review prior submittal to the MaDEP.

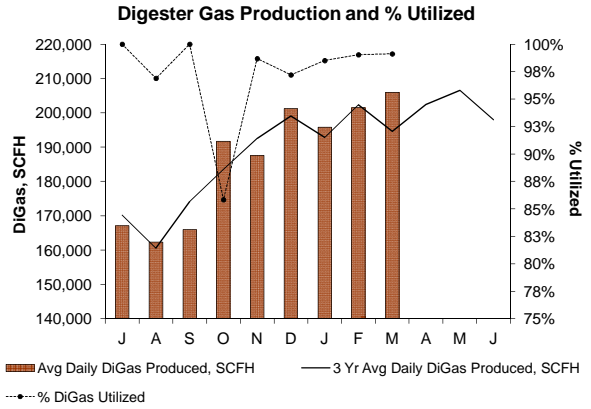
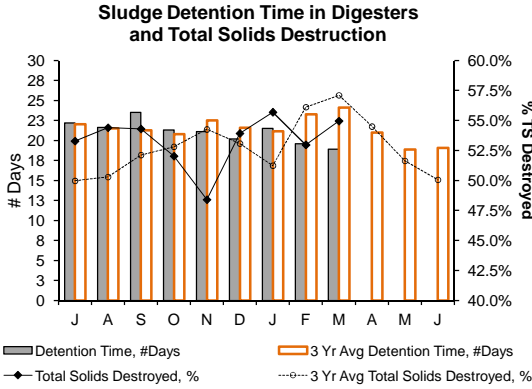
Clinton AWWTP:

Work completed or in progress during the third quarter on the Phosphorus Reduction Facility included:

Mason's completed block and exterior brick work. Painters completed the epoxy coatings inside the wet well, coagulation, flocculation tanks and disk filter basins. A new concrete pad was poured for new generator. Disk filters were delivered and set inside the basins. Fully adhered membrane roof and four skylights were installed. Installation of four new submersible pumps to feed the coagulation tanks. Emergency generator was delivered and placed on concrete pad.

Deer Island Operations and Residuals

3rd Quarter - FY17



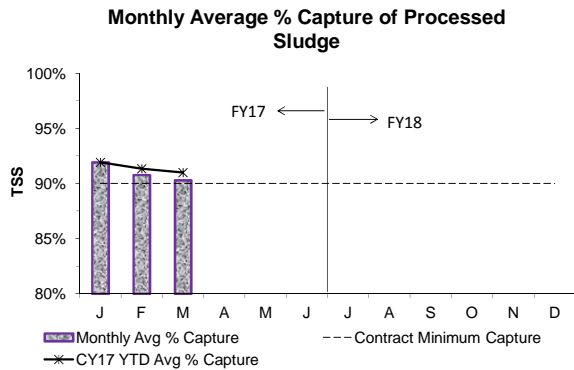
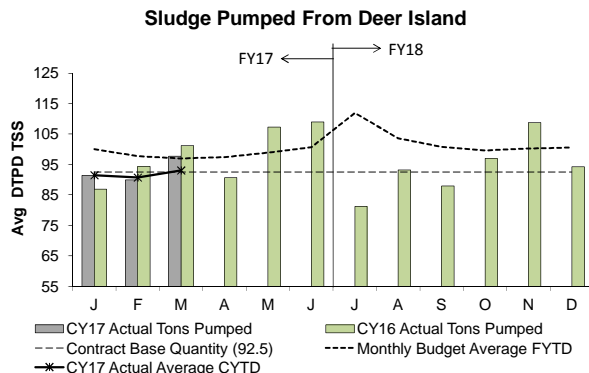
Total solids (TS) destruction following anaerobic sludge digestion averaged 54.6% during the 3rd Quarter, on target with the 3 year average of 54.8% for the same period, as the sludge detention time in the digesters was 20.0 days. DI operated with an average of 8.0 digesters during the 3rd Quarter on target with the 3 year average.

The Avg Daily DiGas Production in the 3rd Quarter was 2.3% above target with the 3 Year Avg Daily DiGas Production for the same period as sludge production was 3.2% higher than expected. On average, 98.9% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant.

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

Residuals Pellet Plant

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



The average total quantity of sludge pumped to the Pellet Plant in the 3rd Quarter of FY17 was 93.1 DTPD - below target with FY17's average budget of 100.6 DTPD (which assumed 3 months of incremental increase due to the impacts of possible codigestion taking place on DITP which was factored in during the FY17 budgeting process).

The contract requires NEFCo to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility in Quincy. The CY17 average capture is 91.0%.

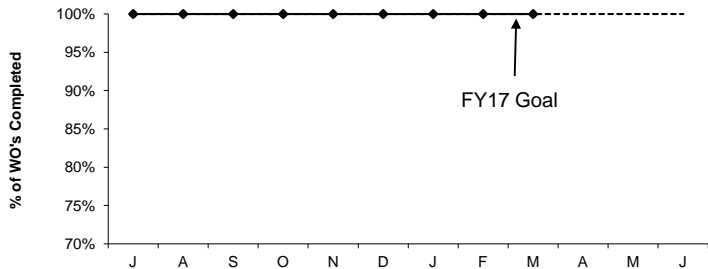
Deer Island Maintenance

3rd Quarter - FY17

Productivity Initiatives

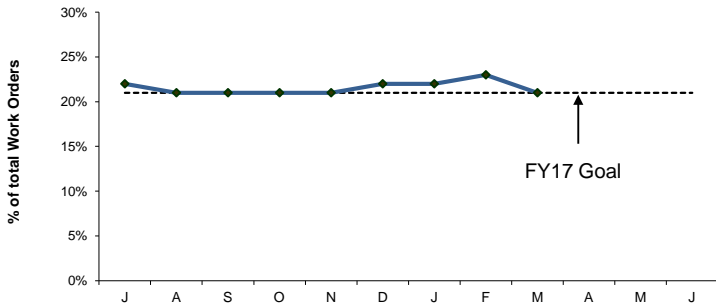
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.

Predictive Maintenance Compliance



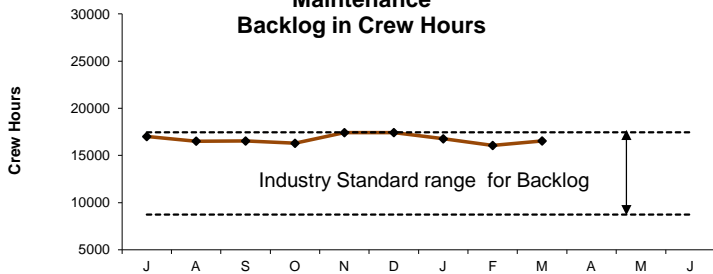
Deer Island's FY17 predictive maintenance goal is 100%. DITP completed 100% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program.

Predictive Maintenance



Deer Island's FY17 predictive maintenance goal is 21% of all work orders to be predictive. 21% 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.

Maintenance Backlog in Crew Hours

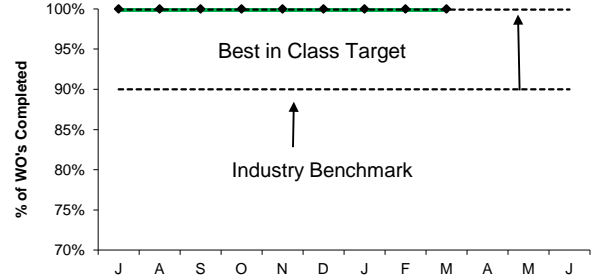


DITP's maintenance backlog at Deer Island is 16,452 hours this quarter. DITP is within the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by four vacancies; two M&O Specialists, Instrument Technician, and an Electrician. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

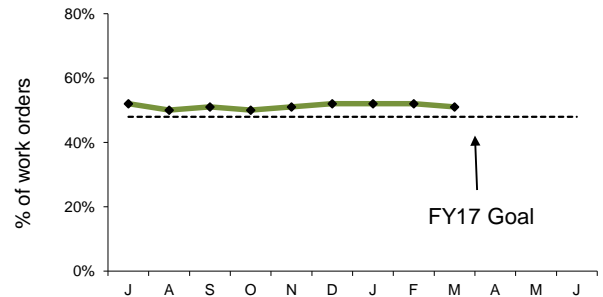
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.

Preventive Maintenance Compliance



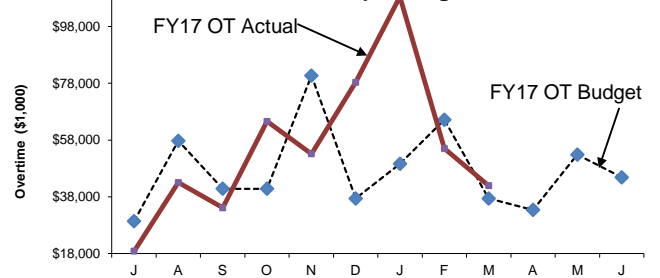
Deer Island's FY17 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 100% of all PM work orders this quarter.

Maintenance Kitting



Deer Island's FY17 maintenance kitting goal is 48% of all work orders to be kitted. 51% 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.

Overtime Spending

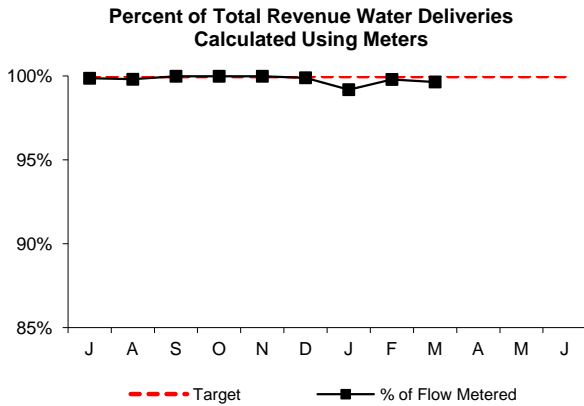


Maintenance overtime was over budget by \$36K this quarter and \$13k over for the year. Management continues to monitor backlog and to ensure all critical equipment and systems are available. This quarters overtime was predominately used for Island Wide HVAC work, Eversource Cable Outage, Storm Coverage, Upgrading Chlorine Analyzer Panels, Clinton WWTP Gas Monitoring Project and the installation of the Grit Building Instrument Air Compressors.

Operations Division Metering

3rd Quarter - FY17

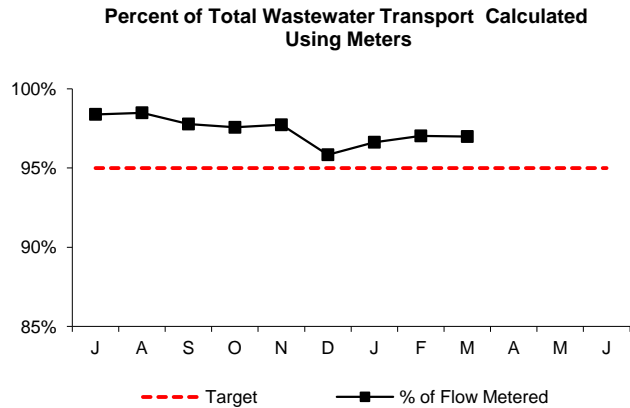
WATER METERS



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 FY17, meter actuals accounted for 99.55% of flow; only 0.45% of total revenue water deliveries were estimated.

The following is the breakdown of reasons for estimations:
 In-house and Capital Construction Projects - 0.12%
 Instrumentation Failure - 0.33%

WASTEWATER METERS

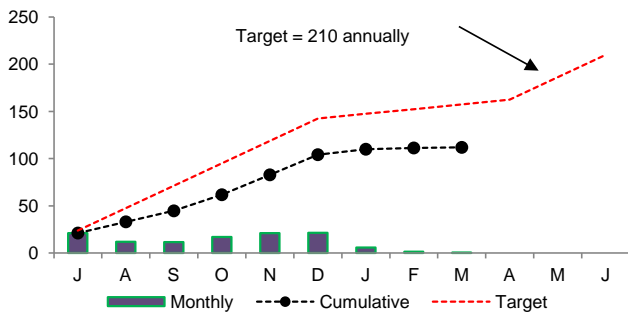


The target for revenue wastewater transport calculated using meters is 95%. Estimates are generated for meters missing data due to instrument failure and/or erratic meter behavior. Estimates are produced using data from previous time periods under similar flow conditions.

During the 3rd quarter of FY17, meter actuals accounted for 96.88% of flow; only 3.12% of wastewater transport was estimated.

WATER DISTRIBUTION SYSTEM PIPELINES

Miles Surveyed for Leaks



During the third quarter, 7.74 miles of water mains were inspected. The total inspected for the fiscal year to date is 111.96 miles. Miles surveyed, below target due to training of new staff, winter weather issues (snow), and extensive leak

Leak Backlog Summary

Month	J	A	S	O	N	D	J	F	M	A	M	J
Leaks Det	3	2	2	3	3	3	0	0	3			
Leaks Rep	1	1	1	4	2	2	2	1	1			
Backlog	7	8	9	8	9	10	8	7	9			
Avg. Lag T	24.9	42.3	36.7	41.3	45.2	51.9	62.3	70.6	67.4			

During the third quarter, three new leaks were detected, and four leaks were repaired. Refer to FY17 Leak Report below for details. Also, community service ranging from individual leak location to hydrant surveys were conducted for: Arlington, Boston, Brookline, Canton, Lexington, Lynn, Malden, Medford, Newton, Norwood, Revere, Somerville, and Wakefield.

FY17 Leak Report as of 2nd Q FY17

Date Detect	Location of Leaks	Repaired
7/22/2016	69 Riverside Avenue, Medford	7/29/2016
1/11/2015	Arborway @ St. Joseph St., West Roxbury	8/15/2016
9/15/2016	West Squantum @ Amsterdam Ave., Quincy	9/20/2016
10/12/2016	Prospect St at Sun St, Waltham	10/13/2016
10/13/2016	1025 West Roxbury Parkway, Brookline	10/17/2016
8/11/2016	Lee St at Boylston St, (Rte 9), Brookline	10/20/2016
10/18/2016	West St at Lagrange St, West Roxbury	10/26/2016
11/2/2016	Morton St at Blue Hill Ave, Dorchester	11/7/2016
6/1/2016	Commonwealth Ave at Oakland Ave, Newton	11/30/2016
11/6/2016	2 Lynn Fells Parkway, Stoneham, Section 70	12/22/2016
11/6/2016	122 Lynn Fells Parkway, Melrose, Section 70	12/30/2016
9/28/2016	Quinobequin Road at Rte 128, Newton, Section 80	1/4/2017
12/20/2016	Main St at Madison, Malden, Section 49	1/9/2017
8/30/2016	Morton St at American Legion Hwy, Section 20	2/22/2017
7/16/2015	Capt Robt Cook Dr, Needham, Section 80	3/15/2017

Detected	Location of Leaks/Unrepaired
6/8/2015	Allandale Rd. @ Grove St., Brookline, Sched for late Fall
6/17/2015	Washington St at East St, Dedham; Single main in SEH service area.
7/1/2016	Forest St, Winch, Sect 89, not surfacing, need new NIH line in service
7/26/2016	Res Plygrnd, Cleveland Cir, Fisher Hill main, leaking into drain, not surfacing
12/4/2016	1025 W Rxbby Pkwy, Brookline, Sect 95, not surfacing
12/4/2016	710 Aslhland St/Summer St Lynn, Sect 91, not surfacing
3/20/2017	355 Hyde Park Ave, Sect 39, line isolated, repair in April
3/22/2017	Route 128 NB, Newton, Sect 80, line isolated, repair in April
3/27/2017	Recreation Road, Weston, Sect 80, line isolated, repair in April

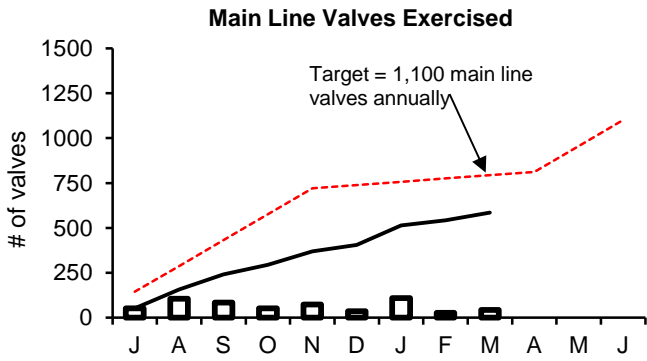
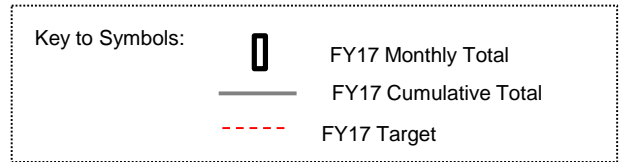
Water Distribution System Valves

3rd Quarter - FY17

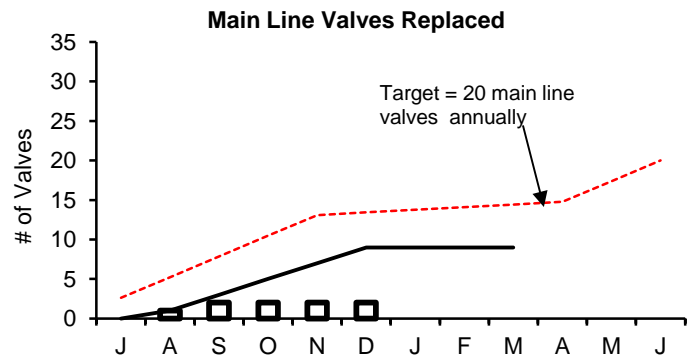
Background

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.

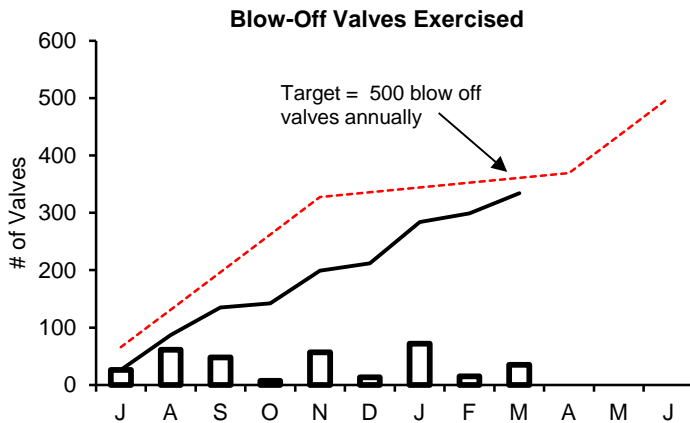
Type of Valve	Inventory #	Operable Percentage	
		FY17 to Date	FY17 Targets
Main Line Valves	2,159	97.2%	95%
Blow-Off Valves	1,317	95.7%	95%
Air Release Valves	1,380	94.3%	95%
Control Valves	49	100.0%	95%



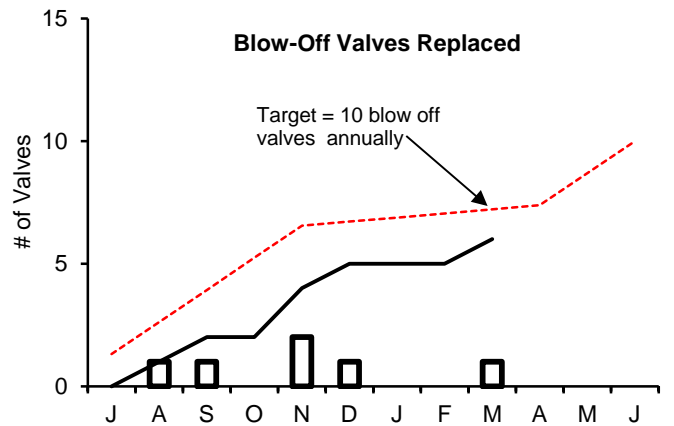
During the third quarter, 181 main line valves were exercised. The total exercised for the fiscal year is 586. Below target due to CIP/8M permit construction contract.



During the third quarter, no main line valves were replaced. The total replaced for the fiscal year is nine. Projects other than valve replacements have been the current work priority, such as: Deer Island Riprap Installation.



During the third quarter, 122 blow off valves were exercised. The total exercised for the fiscal year is 334.



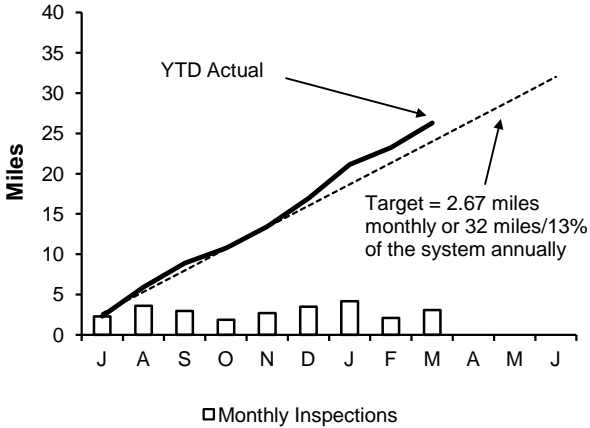
During the third quarter, one blow off valve was replaced. The total replaced for the fiscal year is six. Projects other than blow off retrofits are the current work priority.

Wastewater Pipeline and Structure Inspections and Maintenance

3rd Quarter - FY 17

Inspections

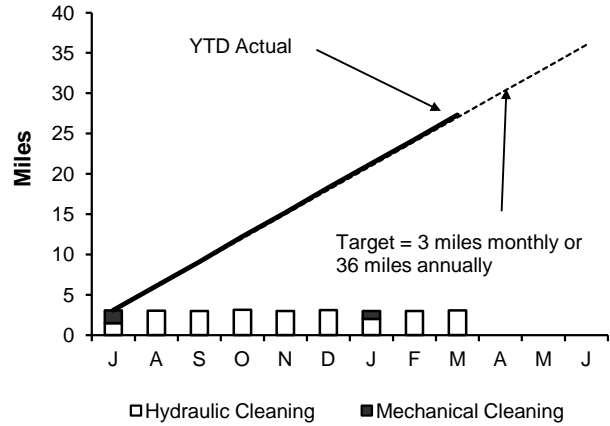
Pipeline Inspections



Staff internally inspected 9.34 miles of MWRA sewer pipeline during the quarter. The year to date total is 26.28 miles. No Community Assistance was provided this quarter.

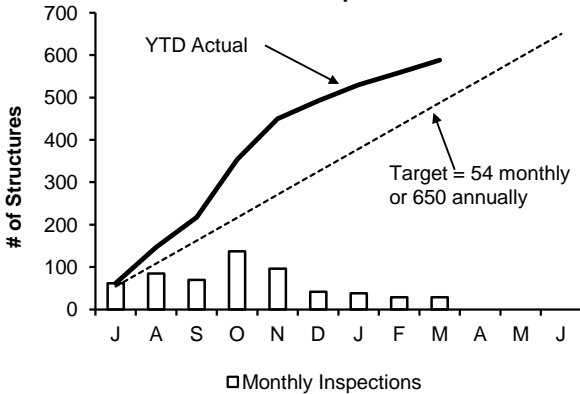
Maintenance

Pipeline Cleaning



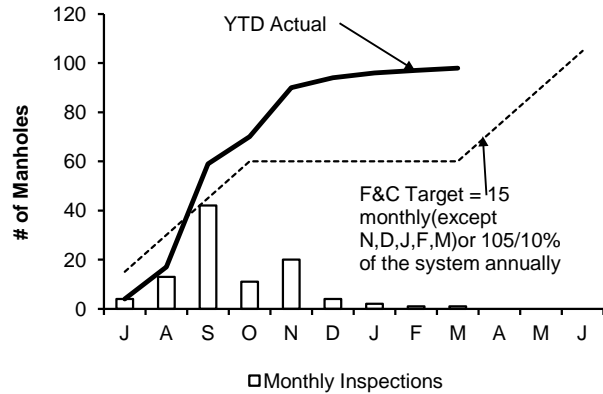
Staff cleaned 9.03 miles of MWRA's sewer system and removed 45 yards of grit and debris during the quarter. The year to date total is 27.31 miles. No Community Assistance was provided this quarter.

Structure Inspections



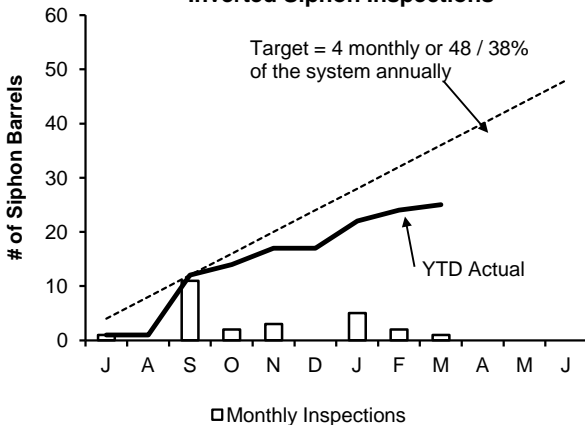
Staff inspected the 36 CSO structures and performed 60 additional manhole/structure inspections during this quarter. The year to date total is 588 inspections.

Manhole Rehabilitation



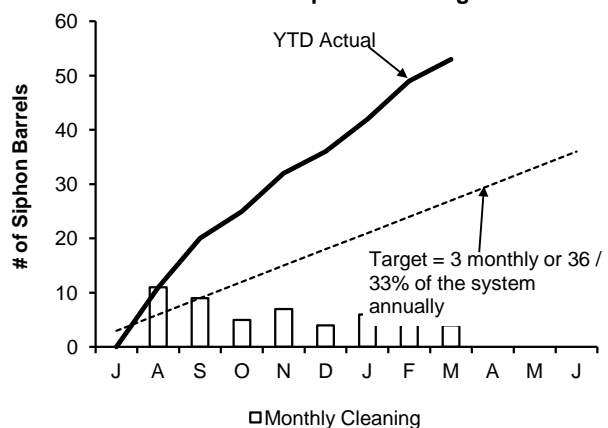
Staff replaced 4 frames & covers were replaced this quarter. The year to date total is 98.

Inverted Siphon Inspections



Staff inspected 8 siphon barrels this quarter. Year to date total is 25 inspections.

Inverted Siphon Cleaning

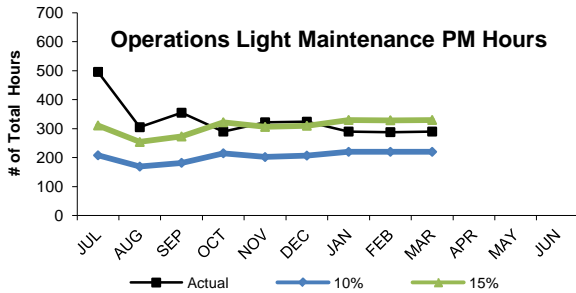


Staff cleaned 8 siphon barrels were inspected this quarter. Year to date total is 53.

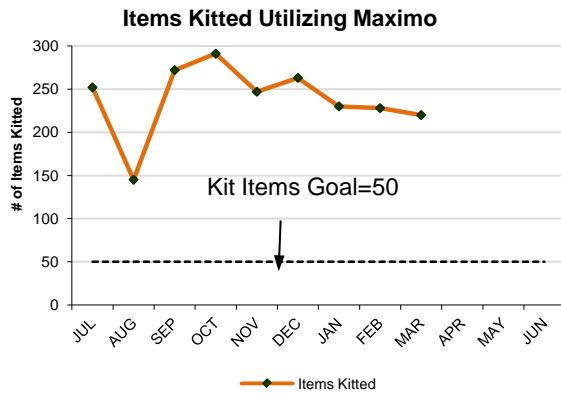
Field Operations' Metropolitan Equipment & Facility Maintenance

3rd Quarter - FY17

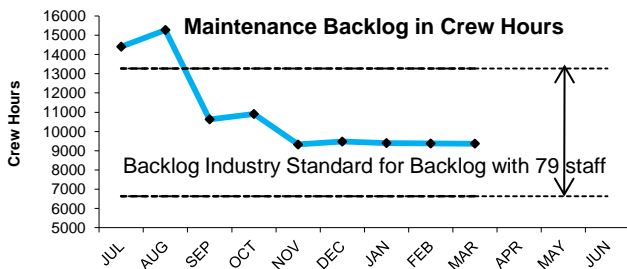
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



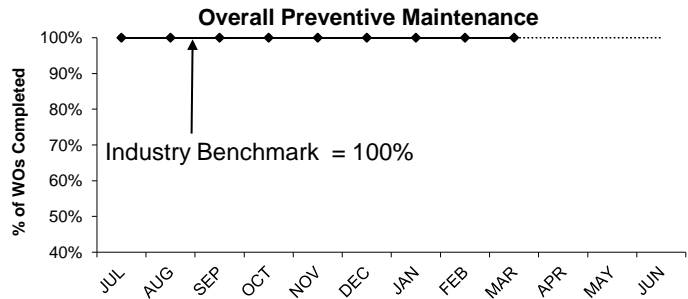
Operations staff averaged 289 hours of preventive maintenance during the 3rd Quarter, an average of 15% of the total PM hours for the 3rd Quarter, which is within the industry benchmark of 10% to 15%.



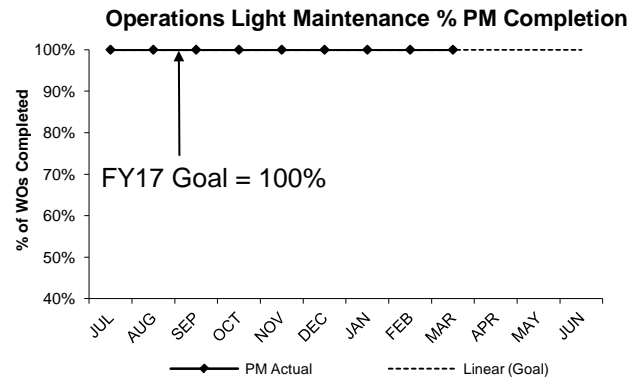
In an effort to more efficiently complete work, maintenance staff and work coordination staff have utilized the Lawson/Maximo interface to better kit stock and non stock material. The goal for FY17 is to "kit" 50 stock and non stock items total per month. An average of 226 items were kitted during the 3rd Quarter



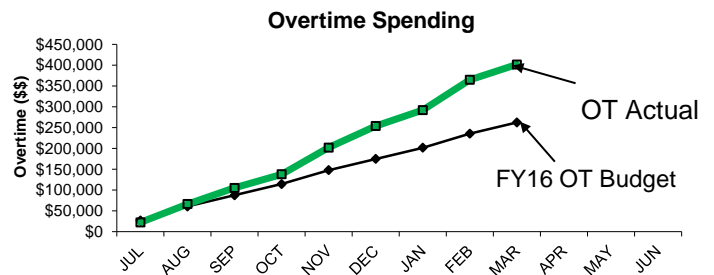
The 3rd Quarter backlog average is 9382 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6450 to 12,940 hours.



The Field Operations Department (FOD) preventive maintenance goal for FY17 is 100% of all PM work orders. Staff completed an average of 100% of all PM work orders in the 3rd Quarter.



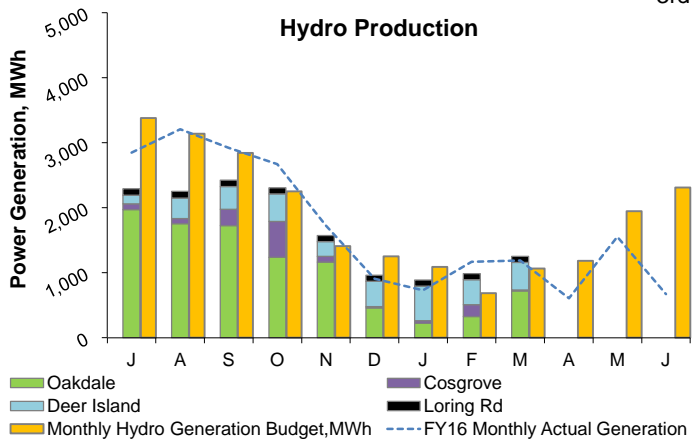
Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY17 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 3rd Quarter.



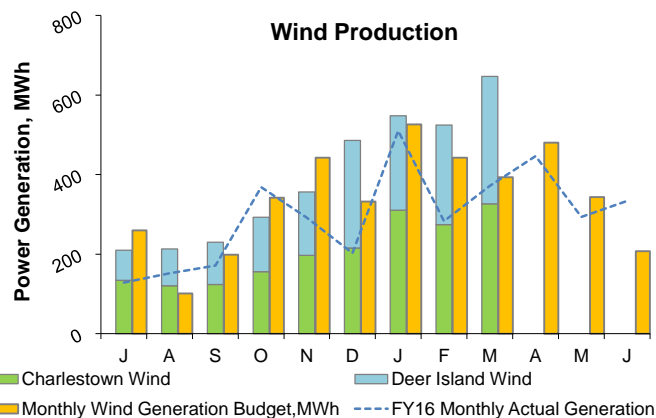
Maintenance overtime was \$60k over budget for the 3rd Quarter. Overtime was used for staging weather events and performing critical maintenance repairs.

Renewable Electricity Generation: Savings and Revenue

3rd Quarter - FY17

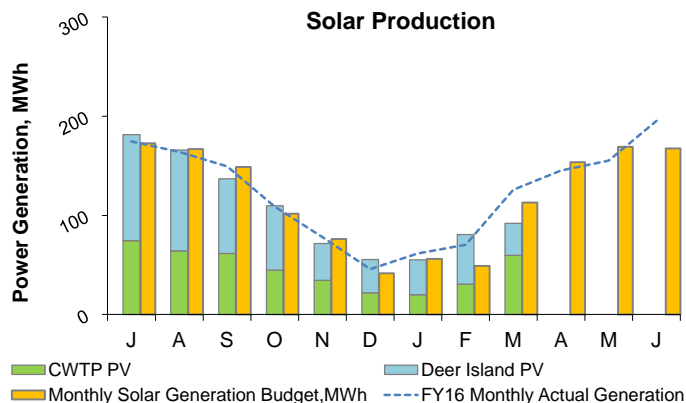


In the 3rd quarter, the renewable energy produced from all hydroelectric facilities totaled 3,127 MWh; 10% above budget³. The total energy produced to date in FY17 is 14,938 MWh; 13% below budget³, partly due to Cosgrove operating at a lower rate for scheduled testing, and both Deer Island hydro turbines being temporarily off-line due to mechanical issues (during the first quarter). The total savings and revenue² to date in FY17 (actuals through February¹) is \$496,700; 44% below budget³, partly due to the fact that the actual electricity unit price for Deer Island has been 11% below the budgeted³ estimate for the same period and due to the reasons stated above. The savings and revenue value does not include RPS REC revenue (see next page).

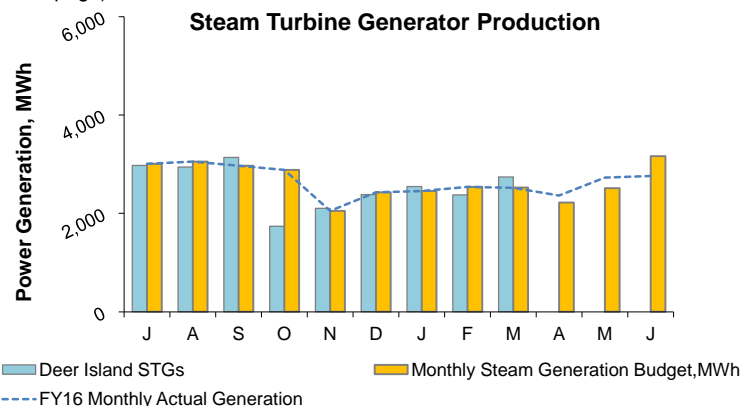


In the 3rd quarter, the renewable energy produced from all wind turbine generators totaled 1,719 MWh; 26% above budget³. The total energy produced to date in FY17 is 3,507 MWh; 15% above budget³. The total savings and revenue² to date in FY17 (actuals through February¹) is \$396,876; 5% above budget³.

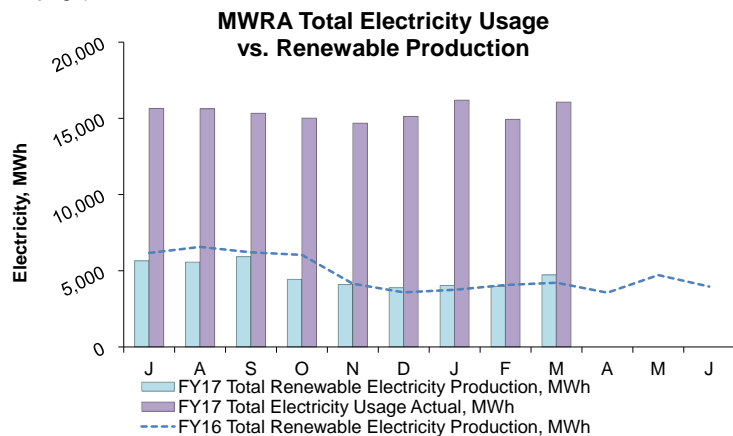
The savings and revenue value does not include RPS REC revenue (see next page).



In the 3rd quarter, the renewable energy produced from all solar PV systems totaled 228 MWh, 4% above budget³. The total energy produced to date in FY17 is 949 MWh; 2% above budget³. The total savings and revenue² to date in FY17 (actuals through February¹) is \$95,380; 2% above budget³. The savings and revenue value does not include RPS REC revenue (see next page).

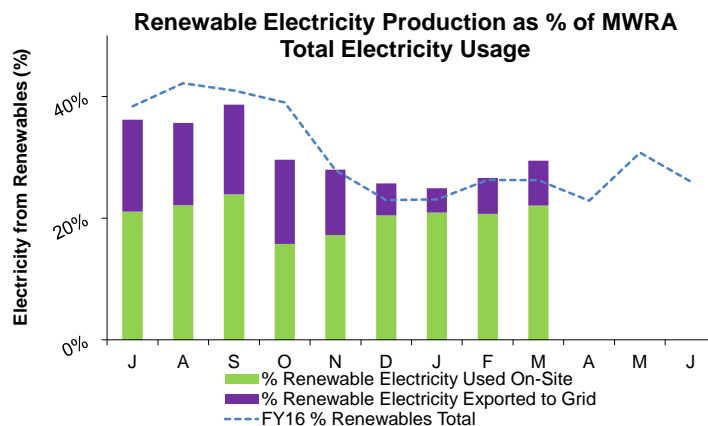


In the 3rd quarter, the renewable energy produced from all steam turbine generators totaled 7,666 MWh, 2% above budget³. The total energy produced to date in FY17 is 22,948 MWh; 4% below budget³. The total savings and revenue² to date in FY17 (actuals through February¹) is \$1,594,760; 16% below budget³, partly due to the fact that the actual electricity unit price for Deer Island has been 11% below the budgeted³ estimate for the same period. The savings and revenue value does not include RPS REC revenue (see next page).



In the first 3 quarters of FY17, MWRA's electricity generation by renewable resources totaled 42,329 MWh. MWRA's total electricity usage was approximately 138,658 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.

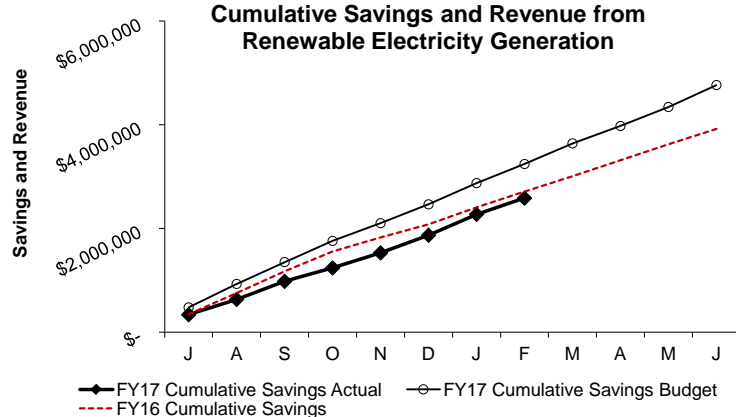
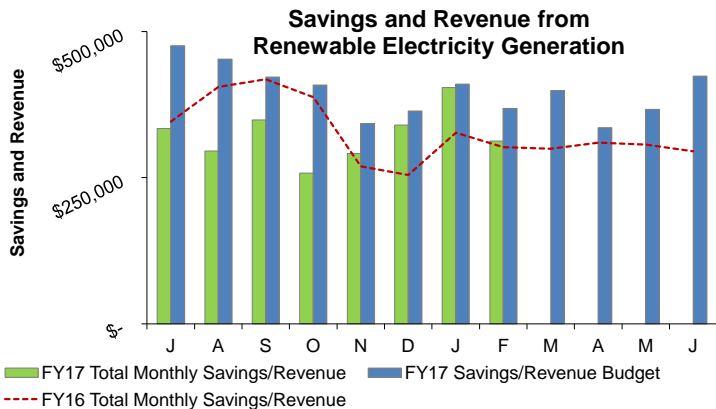
In the first 3 quarters of FY17, green power generation represented approximately 31% of total electricity usage. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.



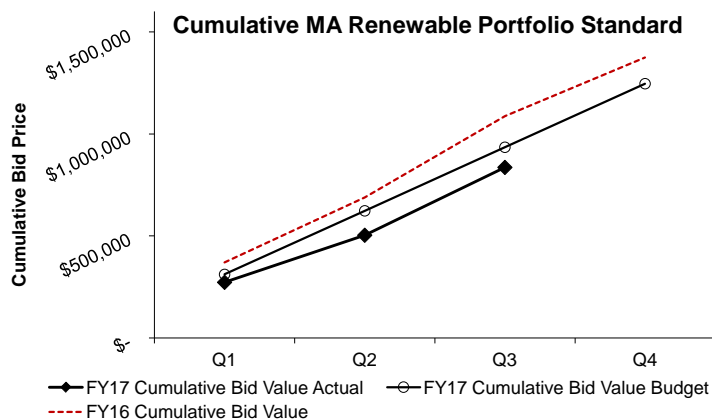
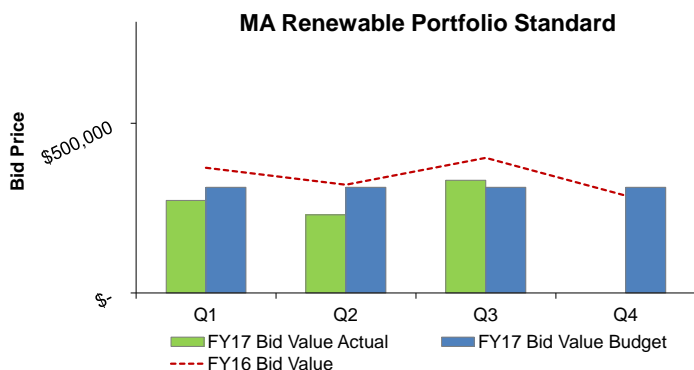
- Notes:
1. Only the actual energy prices are being reported. Therefore, some of the data lags up to 3 months due to timing of invoice receipt.
 2. Savings and Revenue: Savings refers to any/all renewable energy produced that is used on-site therefore saving the cost of purchasing that electricity, and 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 - FY17

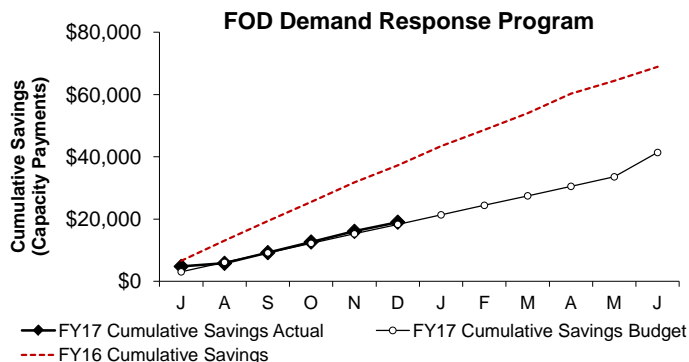
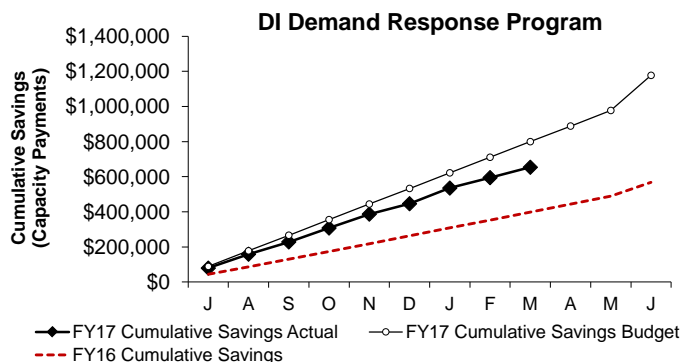


Savings and revenue from MWRA renewable electricity generation in the first 8 months of FY17 (actuals through February¹) is \$2,583,717; which is 20% below the budget³, partly due to the fact that the actual electricity unit price for Deer Island has been 11% below the budgeted³ estimate for the same period. Also due to DI STGs performing 40% below budget in October due to annual maintenance work on both STGs and the entire Thermal Power Plant. Savings and revenue² from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs). The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).



Bids were awarded during the 3rd Quarter¹ from MWRA's renewable energy assets; 7,428 Q3 CY2016 Class I Renewable Energy Certificates (RECs), 3,513 Q3 CY2016 Class II RECs, and 97 Q3 CY2016 Solar RECs were sold for a total value of \$332,460 RPS revenue; which is 7% above budget³ for the Quarter. REC values reflect the bid value on the date that bids are accepted, even though the RECs were produced during Q3 of CY2016. Cumulative bid values reflects the total value of bids received to date.

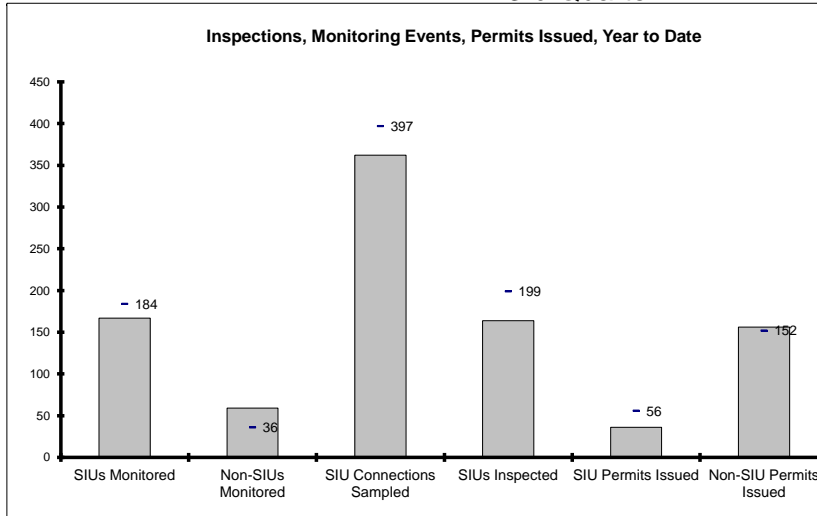
Note: Only Class I and Solar RECs were sold for Q1 CY2016 sales. All of the available Q1 CY2016 Class II RECS were transferred to the electricity supplier (Direct Energy) to meet MWRA's obligation to them.



Currently Deer Island, JCWTP, and Loring Rd participate in the ISO-New England Demand Response Programs⁴. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY17 Cumulative savings (Capacity Payments only) through March¹ total \$653,736 for Deer Island and \$19,014 for FOD through December¹.

- Notes:
1. Only the actual energy prices are being reported. Therefore, some of the data lags up to 3 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 - FY17



EPA Required SIU Monitoring Events
for FY17: 184
YTD: **167**

Required Non-SIU Monitoring Events
for FY17: 36
YTD: **59**

SIU Connections to be Sampled
For FY17: 397
YTD: **362**

EPA Required SIU Inspections
for FY17: 199
YTD: **164**

SIU Permits due to Expire
In FY17: 56
YTD: **36**

Non-SIU Permits due to Expire
for FY17: 152
YTD: **156**

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.

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						Total Permits Issued	
	0 to 120		121 to 180		181 or more		SIU	Non-SIU
Jul	0	23	0	0	0	0	0	23
Aug	4	14	0	1	0	0	4	15
Sep	2	15	0	1	1	1	3	17
Oct	0	9	0	1	0	0	0	10
Nov	2	9	0	2	0	1	2	12
Dec	6	17	0	1	0	1	6	19
Jan	3	17	0	4	0	0	3	21
Feb	6	16	0	2	1	1	7	19
Mar	11	18	0	2	0	0	11	20
Apr								
May								
Jun								

% YTD	94%	88%	0%	9%	6%	3%	36	156
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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. So far, for this fiscal year, the guidelines have been met regarding the timely issuing of SIU permits within 120 days but 6% were issued over the 181-day timeframe.

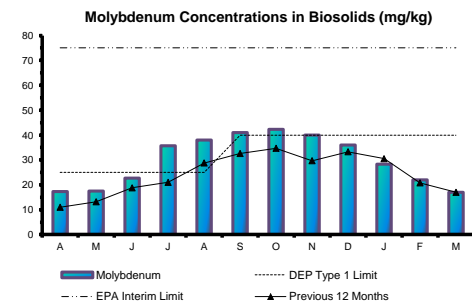
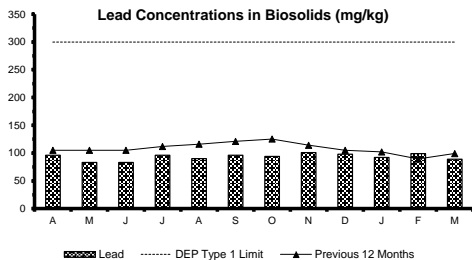
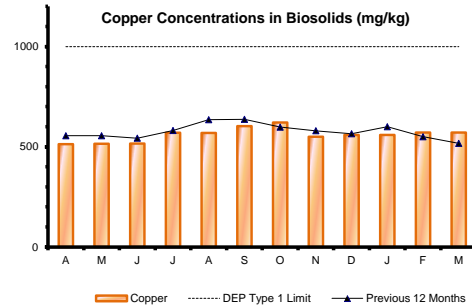
In the 3rd Quarter of FY17, eighty-one permits were issued, twenty-one of which were SIUs. Twenty of the SIU permits were issued within 120 days. There were eight non-SIU permits issued in the 120-day to 180-day timeframe. Two permits - one SIU and one non-SIU - were issued beyond the 180-day period. Delays are attributable to late payment of permit fees and matters relating to category determination and processing issues.

▶▶ The new Clinton AWWTP 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. One such permit was issued in March, complying with the 90-day timeframe.

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.

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

In the last three months, the level of molybdenum has been hovering around the 2016 average for the January to March months. MWRA and its contractor, NEFCO, do not distribute product that does not meet the suitability standards.



Field Operations Highlights – Orange Notebook Bullets

3rd Quarter – FY17

Western Water Operations and Maintenance

- Carroll Water Treatment: Staff initiated annual half plant operations to complete maintenance and cleaning tasks that cannot be completed during full plant operation. Staff cleaned and inspected the primary contactors as well as the B Side Storage Tank and the post treatment chemical tanks, replaced the rupture discs on the primary contactors and all of the check valves in the chemical feed systems, and conducted annual maintenance on the B Side UV reactors. Plant staff also supported the Wachusett Aqueduct Pump Station work within the treatment plant, including installation of new larger ozone destruct fans that remove the ozone from head space of the primary contactors and a weir wall downstream of the primary contactors for flow control purposes when the Pump Station comes online.
- Quabbin Shaft 8 Intake: The Shaft 8 Diversion Facility was activated several times during the month of February to divert water from the Ware River to the Quabbin Reservoir. A total of 1.7 billion gallons of water was diverted during this quarter.

Metro Water Operations and Maintenance

- Winchester Water Withdrawal from Spot Pond: Winchester withdrew water from Spot Pond for 5 days during January. Thirty-one (31) million gallons of water were pumped to the town's Middle Reservoir.
- Local Water Main Breaks: Several local water main breaks occurred during the quarter that also involved MWRA Staff. On Friday, February 9, during the first significant snowstorm of the month, water was reported surfacing on Felton Street in Waltham. WASM 10 is located in this street, and initial concern was that it was an MWRA leak. Valve Staff responded to the site along with Waltham Water Staff. The leak was determined to be on the Waltham distribution system. On Saturday, February 11th, Waltham experienced a major water main break on Totten Pond Road, just south of Route 128. Waltham was initially concerned that their Prospect Hill water storage tanks would be within the area isolated to stop the leak. This was determined not to be the case, and Waltham was able to successfully isolate the leak. Repair materials were loaned to Waltham to expedite the repair. On Tuesday, February 21st, water was reported surfacing on Broadway in Revere. MWRA Section 26 is in this location, and was initially believed to be the source of the leak. Staff isolated Section 26 to see if the leaking water stopped. It did not, confirming that that leak was on the Revere distribution system. Section 26 was returned to service with no impacts to the Northern High Service area. On Tuesday, February 28th, Melrose experienced a break on a 12" main within their distribution system. Repair materials were loaned to Melrose to expedite the repair. Staff responded to a request from the Marblehead Water Department to assist with a leak that occurred on Friday night, March 24th.
- Peabody Water Treatment Plant Fire: As a result of the Coolidge WTP fire in March, the entire Coolidge service area is currently being supplied by MWRA Meter 168. Staff will continue to work with Peabody and their consultant to assist in water supply issues.
- Meter 130-Winchester Modifications: Last summer, service to Winchester through Meter 130, was strained due to high demands (drought and irrigation systems) and the configuration of the piping system at and downstream of the meter. Modifications will be made this spring and fall to provide for a greater flow and higher delivery pressure through the piping system. In order to perform the work, the meter will need to be isolated. A trial shutdown was performed over a 48-hour period during the month to test alternative water supply to the service area. An emergency connection between the Lexington and Winchester that had been installed by staff several years ago as part of the Northern Intermediate High (NIH) Short Term Measures improvements was successfully flushed, tested, and put into use, which will allow for the first phase of work to occur this spring. The work will begin in April.

Operations Engineering: Community Support

Lynn: Continue working with Lynn to create a plan to supply their reservoirs during a drought period, and to update their Emergency Action Plan and help develop a contingency plan, if Lynn loses their treatment plant.

Community Hydraulic issues:

- Newton: Several areas have experienced low pressures this summer including the Newton Wellesley Hospital and Wegman's. Staff continue to work with the city to help resolve water quality and the pressure issues.
- Milton: Continue to work with Milton to help resolve system issues due to the Blue Hills Ski Area taking a large amount of water. When the ski area takes water, the Town's Big Blue Tank empties and does not recover quickly. Operations conducted fire flow tests, which demonstrated that the meter could supply the water needed and the problem was internal to the town.

Water Quality Meetings: Staff from several departments are meeting with the communities to discuss current DEP Policies, water quality, hydraulics, lead and MWRA Loan programs. The following communities met this quarter: Bedford, Nahant, Newton, Southborough, Swampscott, and Watertown.

Wastewater Operations & Maintenance

- Columbus Park Headworks Utility Power Outage: Operations and Maintenance staffed the Columbus Park Headworks during a prolonged Eversource Utility power outage. The outage lasted from 02/02/17 until 02/06/17. A back-up portable generator was brought to the facility as a precaution, while the facility generator powered the station. There were no interruptions in flow and no operational impacts.
- Nut Island and Braintree/Weymouth Relief Pump Station Carbon Replacement: Operations Staff worked with Process Control and Maintenance Staff to replace the carbon in the five carbon beds in the Odor Control System at Nut Island and those at Braintree/Weymouth Relief Pump Station. The carbon replacement started in late February and was completed in late March.

TRAC

Special Note: A new Clinton NPDES Permit became effective on March 1, 2017. It requires TRAC to Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a Significant Industrial User (SIU). During the month of March 2017, TRAC issued one SIU Permit in Clinton. The permit was issued within 90 days of receipt of the application.

Compliance and Enforcement

- The G2 Permit requires all permittees to complete and submit a Compliance Report to the MWRA by June 30th every two years. TRAC issued sixteen (16) Penalty Assessment Notices (PANs) ranged from \$500 to \$1000 and totaling \$10,750.00 to companies that failed to submit the annual Compliance Report by June 30, 2016 as required by the Group Permit for Food Processing Operations.
- Staff issued 89 Notices of Noncompliance, 111 Notices of Violation, 1 Notice of Proposed Permit Suspension, 3 Return to Permit Letters, 7 Rulings on Request for Reconsideration. 3 Enforcement Orders, 1 Extension Letter and 3 Supplemental Orders to Comply.
- TRAC continues to negotiate resolutions to several high-level enforcement matters.

Environmental Quality-Water

Regulatory and Non-Regulatory Sampling Programs

- Staff completed Round Two Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) Sampling for *Cryptosporidium*. The two year sampling period from April 2015 to March 2017, had no detections of *Cryptosporidium*, confirming current treatment targets.

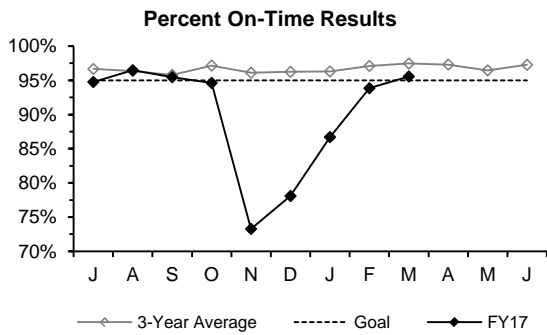
Community and Inter-Agency Support:

- Water Chemistry/Contaminant Monitoring System (CMS) Staff performed a Blending Study using raw and finished water from Lynn blended with MWRA water. This study is part of an investigative study evaluating water quality impacts from emergency connections to MWRA's water supply. The results from this study will show the impacts of blended water on water quality in a distribution system.
- Staff has provided two Turner Sondes, used for the detection and measurement of crude oil and refined fuels in the source water reservoir, to DCR Staff. Training was provided on calibration and procedures for general use.

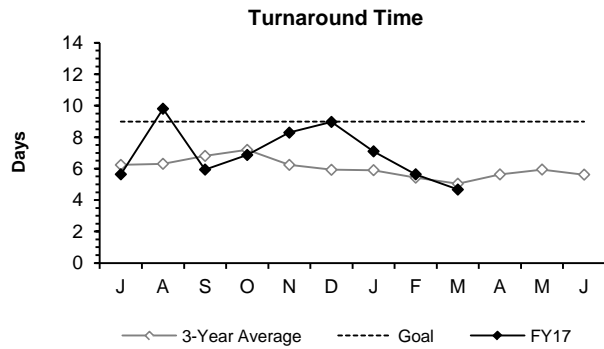
Environmental Quality-Wastewater

- Ambient Monitoring: The first 2017 Water Column Monitoring Survey was delayed due to weather, but was carried out successfully in mid February. EPA and DEP approved MWRA's proposal to delete two Contingency Plan thresholds prone to "false alarms" (exceedances that do not indicate degradation caused by MWRA's discharge). 2016 data sets were sent to the Project Scientists for analyses for discussion at a workshop this spring and eventual publication in the annual Outfall Monitoring Overview.
- Harbor/Beach/CSO Monitoring: Harbor-wide monitoring continues through the winter. Additional details on the CSO Receiving Water Monitoring Program were provided to DEP and staff began assembling data needed for the more detailed temporal analysis requested by DEP for this year's CSO Variance Water Quality Report.
- NPDES Reporting: Staff continued to prepare for reporting under the new Clinton Permit which is effective on March 1st. A letter requesting clarification of a few items in the permit, and a minor modification to correct typographical errors, was sent to EPA.
- Cooperation with Other Agencies: ENQUAL Staff provided technical review comments for the Massachusetts Bays Program Study of Embayments. ENQUAL Staff also attended a meeting of Save the Harbor/Save the Bay's Beaches Science Committee.

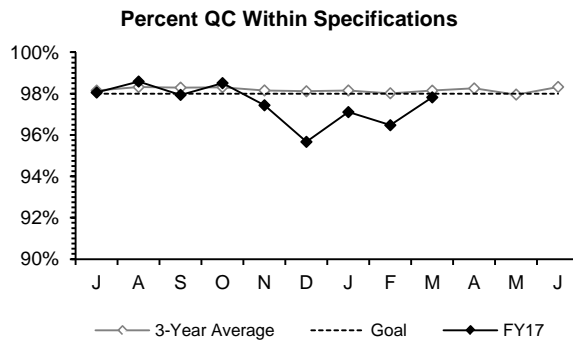
Laboratory Services 3rd Quarter - FY17



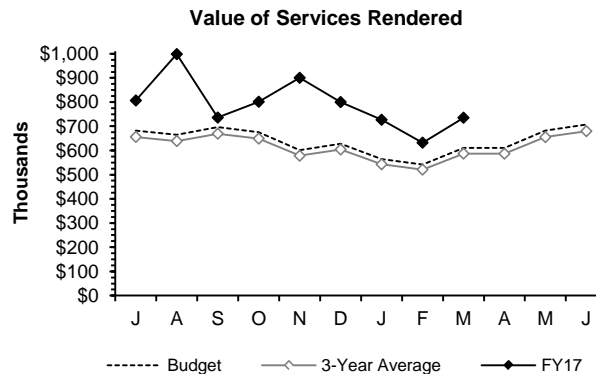
The Percent On-Time measurement was above the 95% goal for one month of the quarter when the backlog of School Lead samples decreased.



Turnaround Time was faster than the 9-day goal for each month of the quarter.



Percent of QC tests meeting specifications was slightly below the 98% in-house goal for the last month of the quarter.



Value of Services Rendered was above the seasonally adjusted budget projection each month of the quarter due to the School Lead project.

Highlights:

Dr. Delaney has been elected as the Vice Chair of EPA's Environmental Laboratory Advisory Board (ELAB). Also, Delaney and Blodgett have submitted a paper for peer-reviewed publication entitled, "Free Cyanide Forms During Drinking Water Free Cyanide Determination".

Quality Assurance:

The five laboratory locations received 100% correct scores on the 381 annual chemistry proficiency test parameters. Passing the proficiency test samples is a requirement to maintain DEP laboratory certification.

Clinton:

We successfully completed the first month of sampling and testing for the new NPDES permit. Also, we have applied for DEP laboratory certification for Clinton Laboratory.

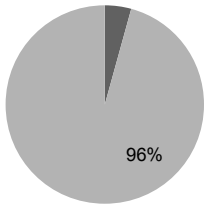
School Lead:

We continued to test school lead samples from our communities as quickly as they came in. In March we completed 1,422 lead and copper tests with an average turnaround time of 8.1 days, with 71% of the 677 school samples meeting the target turnaround time of 10 days. Through March we have completed 27,741 school and non-school lead and copper tests since this project began in April 2016.

CONSTRUCTION PROGRAMS

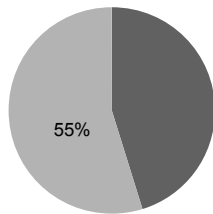
Projects In Construction 3rd Quarter– FY17

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

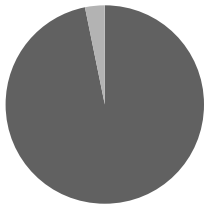
NIH Section 110 Reading & Woburn

Project Summary: This project involves the construction of 8,800 linear feet of 36-inch water transmission main in the City of Woburn and the Town of Reading.

Notice to Proceed: 12-Jan-2016 Contract Completion: 30-Mar-2018

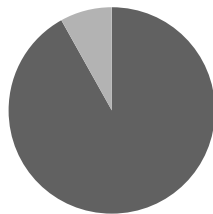
Status and Issues: As of March, the Contractor completed all of the mainline pipe installation and pressure testing, as well as completing the installation of control valve vault and metering vault on Louanis Drive and Leach Park.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

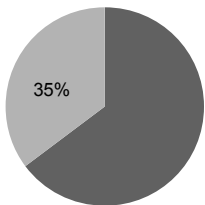
Chelsea Creek Headworks Upgrade

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

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

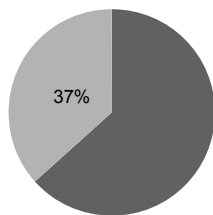
Status and Issues: As of March no physical work has begun. The Contractor is waiting for the DPS building permit which wont be issued until the issues with the plumbing design are addressed.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

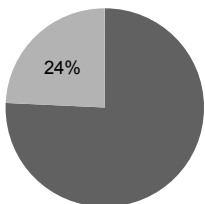
Wachusett Aqueduct Pumping Station

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

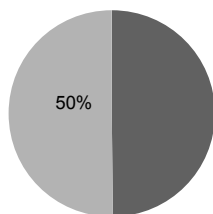
Status and Issues: As of March, the Contractor continued with the installation of the slide/weir gates along line A; the 84" DIA PCCP between TB-1 and TB-3 then backfilled at 84" and 120" PCCP; and ODU #4-6 installed with BFV 03 & 04 coupling.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Alewife Brook Pump Station Improvements

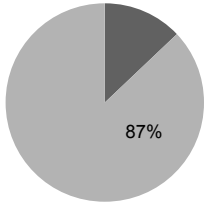
Project Summary: This project involves the replacement of wet-weather pumps, motors, gear drives, VFD's, MCC, screens, sluice gates, standby generator, roof, PLC's and HVAC. Also, the remediation of PCB's and asbestos and the installation of a flow meter on the 66-inch downstream Alewife Brook Conduit.

Notice to Proceed: 29-Jan-2016 Contract Completion: 31-May-2018

Status and Issues: As of March, the Contractor Installed the 36"x18" ABC bypass manifold and 36"x42" ABC discharge reducer; connected HDPE piping to 18"x24" ABS bypass assembly; pressure tested the bypass piping and began testing the diesel bypass pumps.

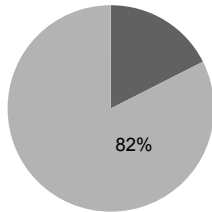
Projects In Construction 3rd Quarter– FY17

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

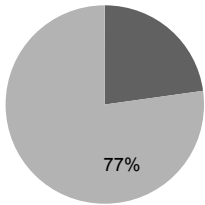
Caruso Pump Station Improvements

Project Summary: This project involves the replacement of the stand-by emergency generator and improvements to the HVAC, fire suppression and security systems at the Caruso Pump Station.

Notice to Proceed: 24-Mar-2016 **Contract Completion:** 3-May-2017

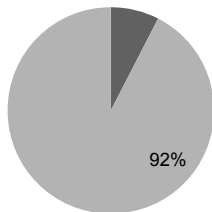
Status and Issues: As of March the Contractor completed the load test, switch over and start-up of the generator; start up of new boiler and began installing the new roof above the lobby.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

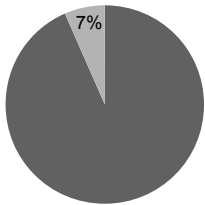
DITP Valves and Piping Replacements

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

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

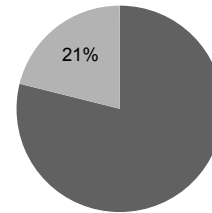
Status and Issues: During four separate shutdowns in the North Main Pump Station, the Contractor completed the replacement of two Butterfly Valves and one flow meter on Train #'s 5 and 6, and commenced the replacement of the valves on Train #2. By the end of the month installation of the 14" glass lined PSL-D piping was completed.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

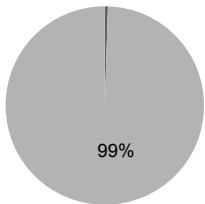
Winthrop Terminal VFD and Motor

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

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

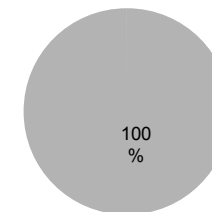
Status and Issues: The Contractor, JFW has begun preparing major equipment submittals. No physical work took place.

Money



■ Amount Remaining
■ Billed to Date

Time



■ 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: The punchlist work is on-going. The Contractor has submitted the necessary documentation required for a Partial Release of Retainage.

CSO CONTROL PROGRAM

3rd Quarter – FY17

All 35 projects in the Long-Term CSO Control Plan are complete, in compliance with Schedule Seven. Remaining CSO related capital spending totaling \$12.7 million is authorized to be spent through December 2020. Remaining work includes Cambridge’s completion of surface restoration work associated with the Alewife/CAM004 sewer separation contracts, BWSC’s removal of additional inflow from its sewers in the South Dorchester Bay sewer separation areas of Dorchester, and the federal court mandated three-year CSO post-construction monitoring and performance assessment (2018-2020).

Project/Item	Status as of March 31, 2017
BWSC Memorandum of Understanding and Financial Assistance Agreement	BWSC attained substantial completion of its last project, Reserved Channel Sewer Separation, in December 2015 in compliance with Schedule Seven. MWRA staff are conducting final eligibility reviews of the BWSC construction contracts. Remaining BWSC work eligible for MWRA funding is limited to supporting and responding to the remaining final eligibility reviews through June 2017, when the MOU/FAA term end, and continuing with inflow removal in the South Dorchester Bay Sewer Separation area (see related item, below).
South Dorchester Bay Sewer Separation Post-Construction Inflow Removal	MWRA’s CIP and the MOU/FAA with BWSC include \$5.4 million for additional inflow removal, of which \$1.7 million has been transferred to the BWSC CSO account and \$1.6 million of that has been withdrawn by BWSC to fund related design and construction work. Staff plan to remove the remaining \$3.8 million from the BWSC MOU/FAA; develop a separate, 3-year financial assistance agreement with BWSC for this project and the remaining funds; and close out the MOU/FAA when its term ends on June 30, 2017. Staff plan to seek Board approval for the new agreement soon.
City of Cambridge Memorandum of Understanding and Financial Assistance Agreement	The City of Cambridge attained substantial completion of its last project, CAM004 Sewer Separation, in December 2015 in compliance with Schedule Seven. Extensive surface restoration work eligible for MWRA funding at a remaining award amount of \$5.8 million is scheduled to continue through December 2017, followed by six months of final eligibility review and close-out of the Cambridge construction contracts and close-out of the MOU/FAA in June 2018.
MWRA CSO Performance Assessment	Staff are developing a draft scope (work plan) for the post-construction monitoring program and performance assessment, which MWRA is required to submit to DEP by May 1, 2017. Staff are also developing a scope of services and RFQ/P for a professional services contract to perform related metering, hydraulic modeling and performance assessments. Staff plan to seek Board authorization to award the professional services contract and issue a Notice to Proceed by January 2018, in compliance with Schedule Seven.

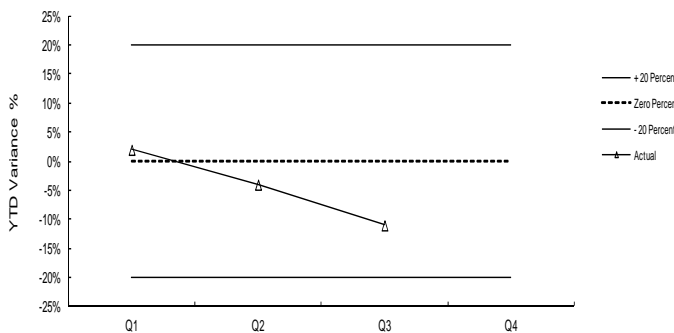
CIP Expenditures 3rd Quarter FY17

FY17 Capital Improvement Program Expenditure Variances through March by Program (\$ in thousands)				
Program	FY17 Budget Through March	FY17 Actual Through March	Variance Amount	Variance Percent
Wastewater	45,442	38,445	(6,997)	-15%
Waterworks	41,802	41,135	(666)	-2%
Business and Operations Support	6,349	3,938	(2,411)	-38%
Total	\$93,593	\$83,519	(\$10,074)	-11%

Underspending within both Wastewater and Waterworks is primarily due to fewer than anticipated community requests for loans and grants. Project underspending within Wastewater is due to delay for final restoration work for the Cambridge Sewer Separation, delay in the award of the Chelsea Headworks Upgrade Construction, and construction issues with the Caruso Pump Station Improvements, partially offset by payment of a legal settlement for Primary/Secondary Clarifier Rehabilitation at Deer Island, construction progress on the Alewife Brook Pump Station Rehabilitation, Clinton Phosphorus Reduction Construction, Deer Island Power System Improvements, North Main Pump Station and Winthrop Terminal Facility Butterfly Valve Replacements, and Digester Sludge Pump Phase 2, and timing of payment for final work on the Deer Island Electrical Upgrades and Chelsea Screenhouse contracts. Project underspending in Waterworks was due to less than anticipated progress on the Rosemary Brook Siphon Building Repairs, schedule changes for Section 89/29 Redundancy Phase 1C Construction and Marlborough Maintenance Facility, and earlier construction issues for Wachusett Aqueduct Pump Station contract, partially offset by contractor progress on Section 89/29 Redundancy Phase 1B Construction, Southern Extra High Section 111 Construction, Hatchery Pipeline Construction, and additional work for the Webster Avenue Bridge Pipe Replacement Construction.

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

Total FY17 CIP Budget of \$155,702,000.



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 3/25/2017	\$35.4 million
Unused capacity under the debt cap:	\$1.250 billion
Estimated date for exhausting construction fund without new borrowing:	MAY-17
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding:	\$128 million
Commercial paper capacity:	\$ 350 million
Budgeted FY17 capital spending*:	\$136 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

3rd Quarter – FY17

Source Water – Microbial Results

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

Sample Site: Quabbin Reservoir

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

All samples collected during the 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.

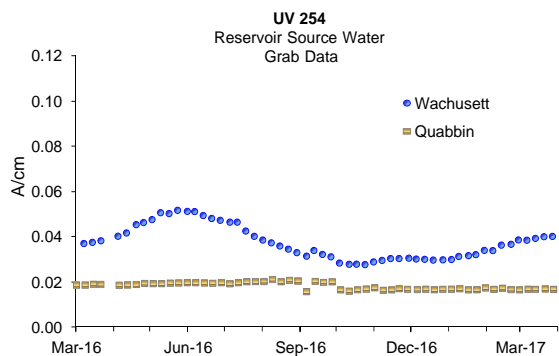
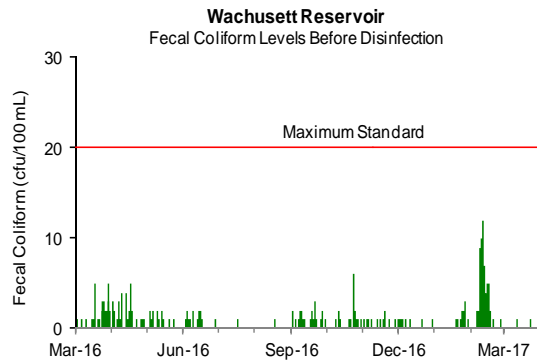
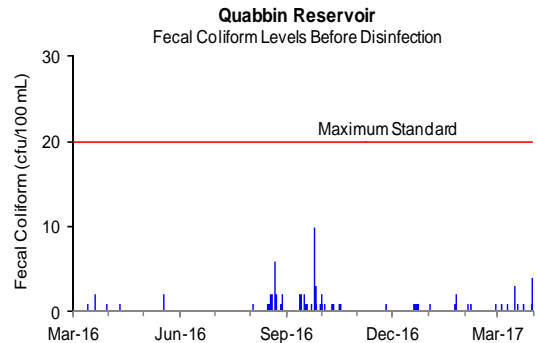
All samples collected during the 3rd Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

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 0.017 A/cm.

Wachusett Reservoir UV-254 levels are currently around 0.040 A/cm.



Source Water – Turbidity

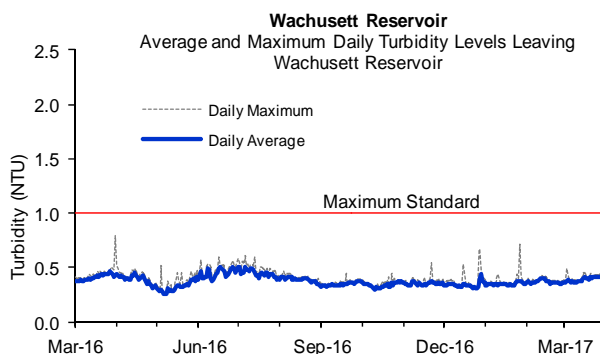
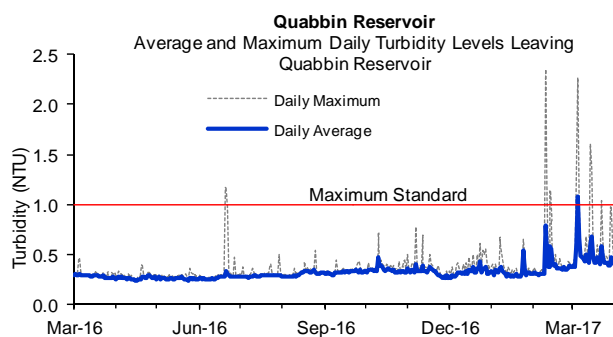
3rd Quarter – FY17

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

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

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

Maximum turbidity results at Wachusett were within DEP standards for the quarter. Maximum turbidity results at Quabbin were within DEP standards for January. High winds on February 9 and February 13 caused the turbidity at the BWTF intake to exceed 1 NTU for 4-7 non-consecutive hours. High north winds on March 4 to 5 and March 14 to 15 caused the turbidity at the BWTF intake to exceed 1 NTU for 2.5 to 10 non-consecutive hours. During these events disinfection effectiveness was not affected; CT was maintained at all times, downstream disinfectant residuals were maintained, and no coliform were detected in downstream samples.

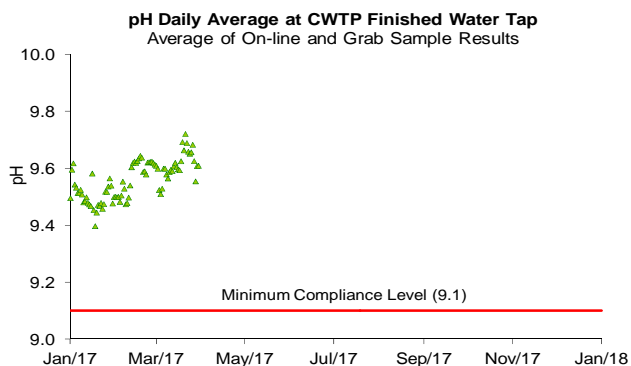
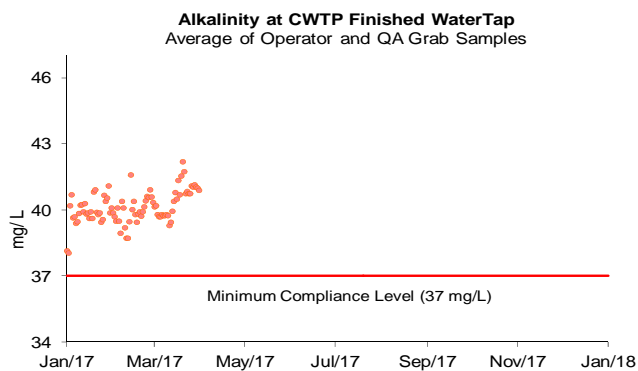


Treated Water – pH and Alkalinity Compliance

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 8 and 9, 2017. Distribution system sample pH ranged from 9.4 to 9.6 and alkalinity ranged from 39 to 41 mg/L. No sample results were below DEP limits for this quarter.



Treated Water – Disinfection Effectiveness

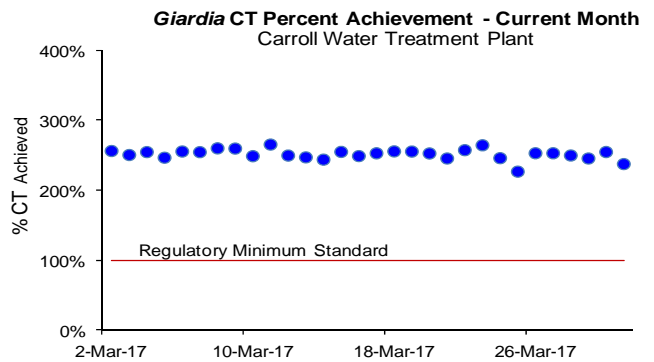
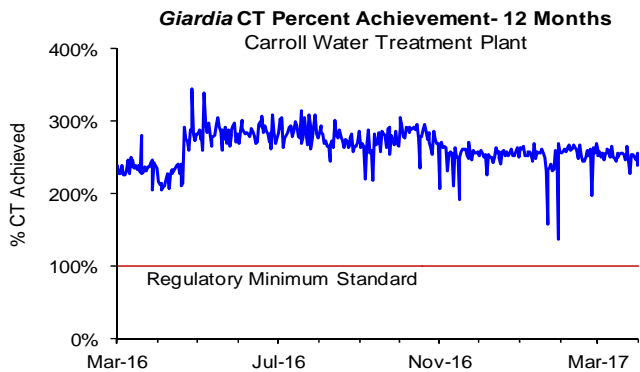
3rd Quarter – FY17

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:

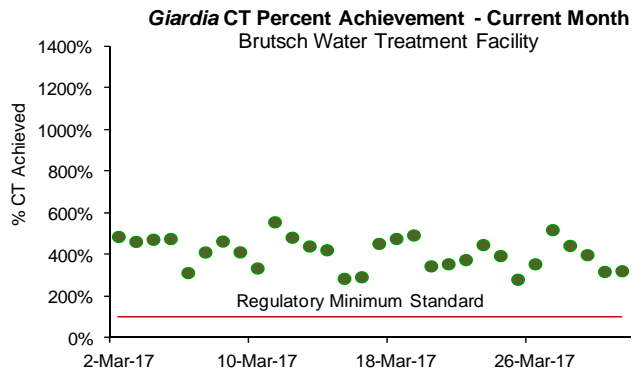
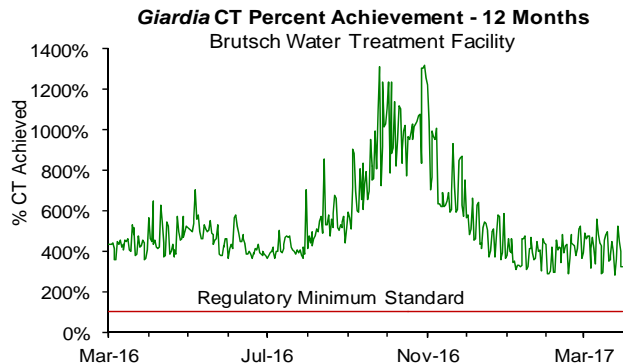
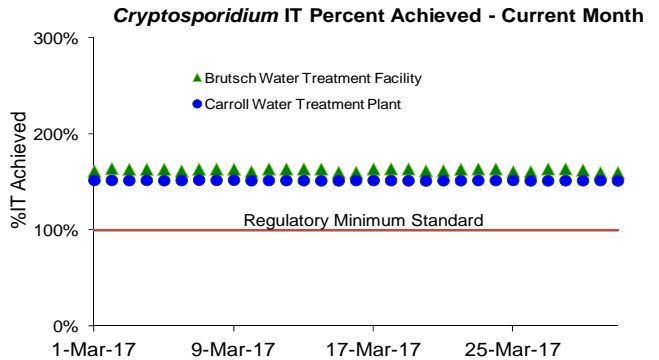
- Ozone dose at the CWTP varied between 1.1 to 1.5 mg/L for the quarter.
- Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- Cryptosporidium* IT was maintained above 100% during 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 (June 1 – October 31) target of ≥ 1.0 mg/L at Ludlow Monitoring Station.
- The chlorine dose at BWTF ranged from 1.3 to 1.4 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%.



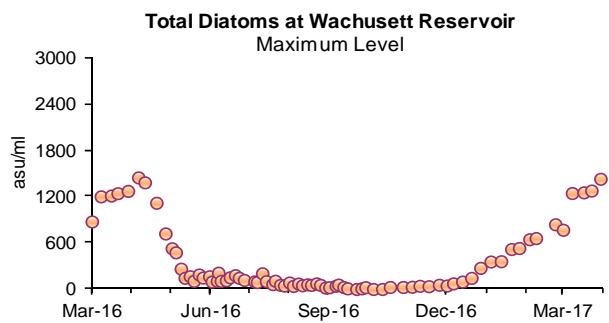
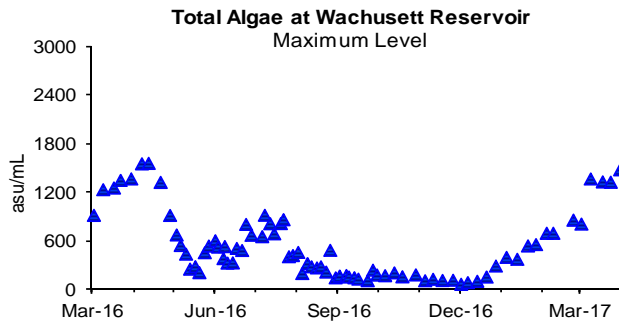
Source Water - Algae

3rd Quarter – FY17

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, five complaints which may be related to algae were reported from the local water departments.



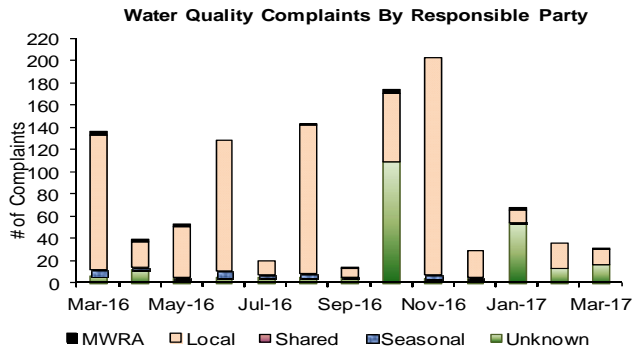
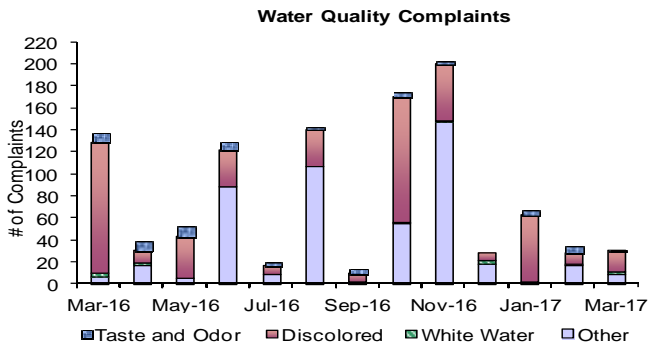
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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

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

Communities reported 136 complaints during the quarter compared to 299 complaints for 3rd Quarter of FY16. Of these complaints, 92 were for "discolored water", 13 were for "taste and odor", 3 were for "white water", and 28 were for "other". Of these complaints, 47 were local community issues, 3 were MWRA related, 1 was seasonal in nature, and 85 were unknown in origin.

•On January 13, Quincy reported fifty discolored water complaints when a water main break occurred at Elmwood Park and Alvin Avenue.



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

3rd Quarter – FY17

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.

The TCR requires that no more than 5% of all samples in a month may be total coliform positive (or that no more than one sample be positive when less than 40 samples are collected each month). Public notification is required if this standard is exceeded.

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 follow-up tests confirm the presence of *E. coli* or total coliform.

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, four of the 6,252 community samples submitted to MWRA labs for analysis tested positive for total coliform. Two of the 1,899 MWRA samples tested positive for total coliform (Somerville, South Hadley FD1 – January; Norwood- February). Only 1.1% of the samples had a chlorine residual lower than 0.2 mg/L for the quarter.

		# Coliform Samples (a)	Total Coliform # (%) Positive	E.coli # Positive	Assessment Required *	Minimum Chlorine Residual (mg/L)		Average Chlorine Residual (mg/L)	
						Level	Violation		
MWRA	d	MWRA Locations	306	0 (0%)	0	1 / 2	-	2.02	2.37
		Shared Community/MWRA sites	1593	2 (0.13%)	0			0.09	2.14
		Total: MWRA	1899	2 (0.11%)	0	<input type="checkbox"/> / <input type="checkbox"/>		0.09	2.18
Fully Served		ARLINGTON	169	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.08	1.92
		BELMONT	104	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.59	2.19
		BOSTON	780	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.50	2.40
		BROOKLINE	224	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.80	2.07
		CHELSEA	169	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.58	2.08
		DEER ISLAND	52	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.90	2.19
		EVERETT	169	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.17	1.28
		FRAMINGHAM	234	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.60	2.22
		LEXINGTON	117	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.67	2.50
		LYNNFIELD	18	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.13	1.34
		MALDEN	234	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.09	2.13
		MARBLEHEAD	72	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.44	2.07
		MEDFORD	221	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.22	1.94
		MELROSE	117	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.62	1.87
		MILTON	102	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.50	1.93
		NAHANT	30	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.38	2.01
		NEWTON	278	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.38	2.08
		NORTHBOROUGH	48	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.34	2.02
		NORWOOD	102	1 (0.98%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.06	1.99
		QUINCY	299	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.14	2.19
		READING	130	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.29	1.87
		REVERE	195	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.41	2.13
		SALGUS	104	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.32	1.86
		SOMERVILLE	278	2 (0.72%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.28	2.32
		SOUTHBOROUGH	30	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.05	1.95
		STONEHAM	91	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.63	2.11
		SWAMPSCOTT	54	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.54	1.83
		WALTHAM	216	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.67	2.09
		WATERTOWN	130	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.55	2.16
		WESTBORO HOSPITAL	15	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.05	0.51
		WESTON	45	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.93	2.32
		WINTHROP	72	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	1.15	2.37
	Total: Fully Served	4899	3 (0.06%)	0	<input type="checkbox"/> / <input type="checkbox"/>				
CVA & Partially Served	b	BEDFORD	57	0 (0%)	0	<input checked="" type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.59	1.65
		CANTON	87	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.04	1.31
		HANSCOM AFB	34	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.24	1.64
		MARLBOROUGH	126	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.06	2.21
		NEEDHAM	123	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.04	0.49
		PEABODY	231	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.36	2.01
		WAKEFIELD	147	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.97	2.07
		WELLESLEY	114	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.02	0.67
		WILMINGTON	85	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.22	1.79
		WINCHESTER	91	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.10	1.62
		WOBURN	195	0 (0%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.13	0.91
		c	SOUTH HADLEY FD1	63	1 (1.96%)	0	<input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	0.15
		Total: CVA & Partially Served	1353	1 (0.07%)	0	<input type="checkbox"/> / <input type="checkbox"/>			
	Total: Community Samples	6252	4 (0.06%)	0	<input type="checkbox"/> / <input type="checkbox"/>				

(a) The number of samples collected depends on the population served and the number of repeat samples required.

(b) These communities are partially supplied, and may mix their chlorinated supply with MWRA chloraminated supply.

(c) Part of the Chicopee Valley Aqueduct System. Free chlorine system.

(d) MWRA total coliform and chlorine residual results include data from 125 community pipe locations as described above. In most cases these community results are accurately indicative of MWRA water as it enters the community system; however, some are clearly strongly influenced by local pipe conditions. Residuals in the MWRA system are typically between 1.0 and 2.8 mg/L.

(e) The TCR requires an assessment be completed if more than 5% of all samples in a month are total coliform positive (or two or more samples are positive when fewer than 40 samples are collected each month).

(f) Some reasons a violation may occur: the required # of TCR samples is not collected; failure to report; an E.coli MCL violation; coliform treatment technique not followed properly; failure to conduct a level 1 or level 2 assessment within 30 days of trigger.

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

3rd Quarter – FY17

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

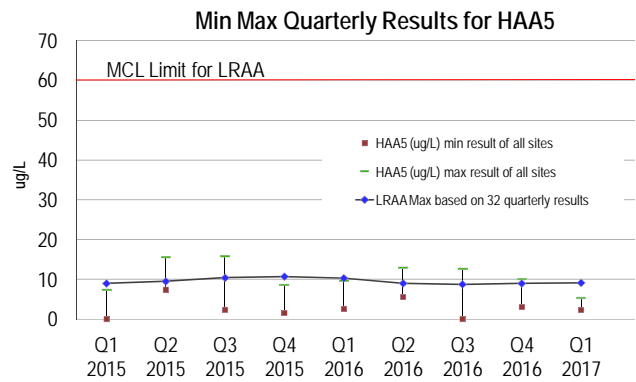
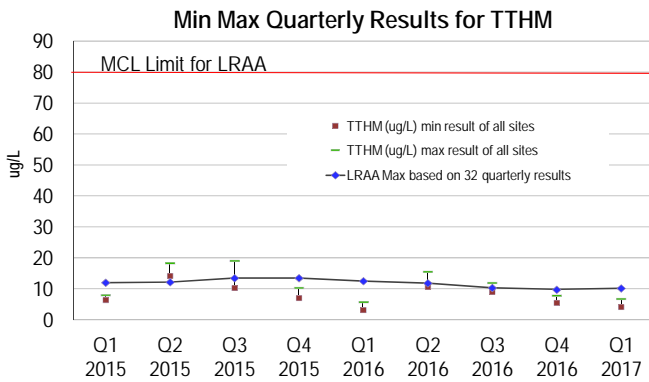
The locational running annual average at each individual sampling location must be below the standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

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

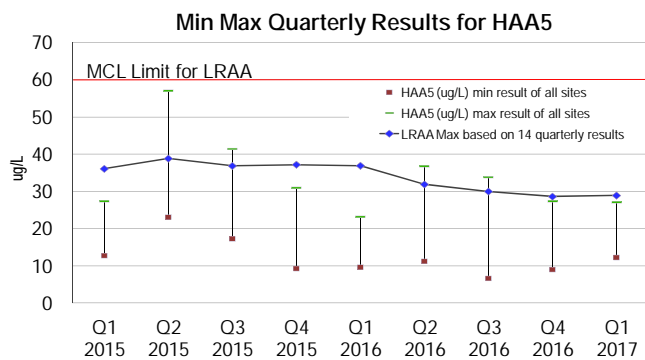
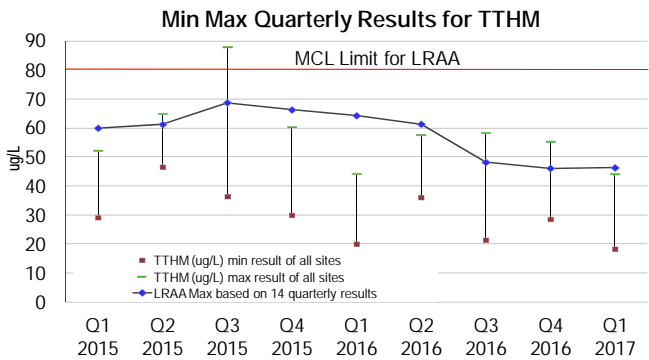
Bromate is tested monthly per DEP requirements for water systems that treat with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA's RAA MCL standard for bromate is 10 µg/L.

The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 10.2 µg/L; HAA5s = 9.1 µg/L. The current RAA for Bromate = 0.0 µg/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

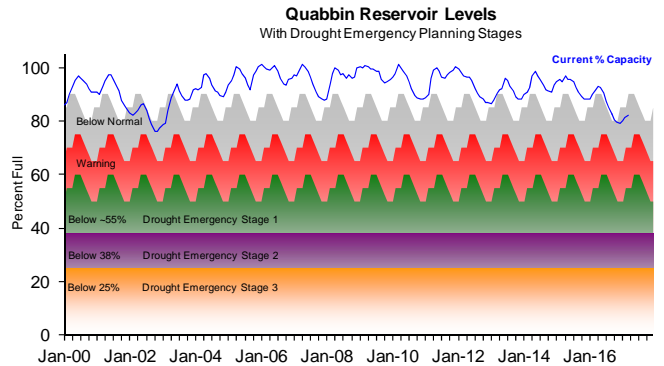
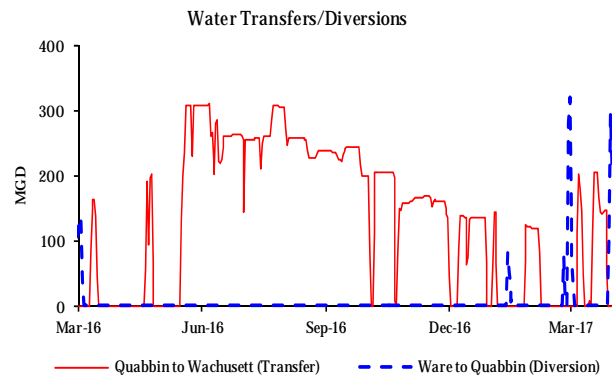
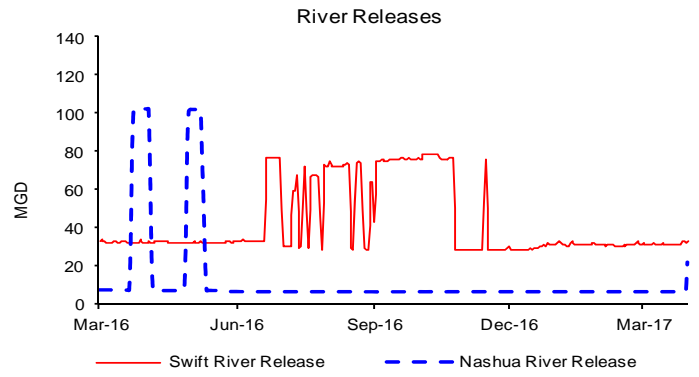
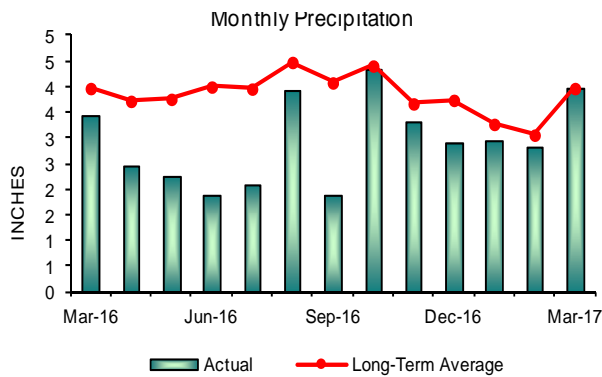
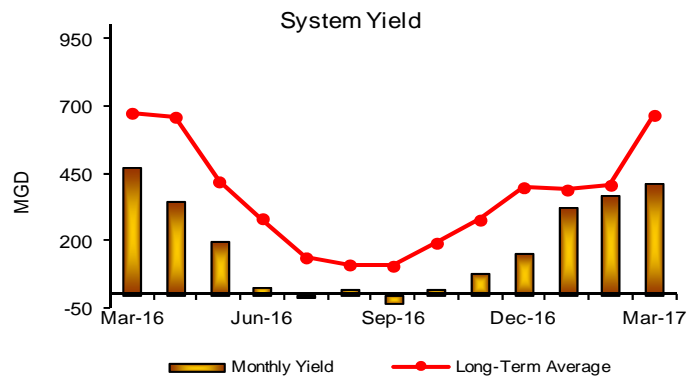
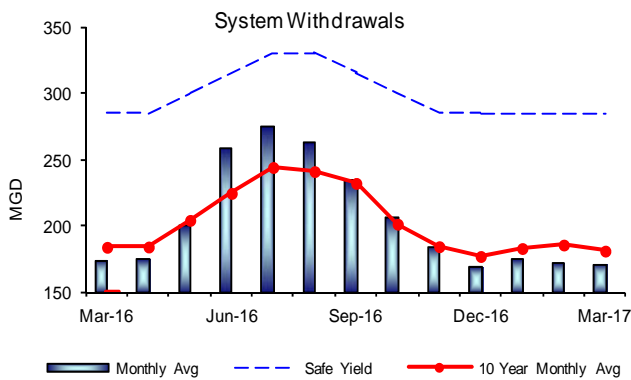
3rd Quarter – FY17

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

Quabbin Reservoir level was in the below normal operating range for the quarter. The volume of the Quabbin Reservoir was at 81.7% as of March 31, 2017; a 2.6% increase for the quarter, which represents a gain of more than 10.5 billion gallons of storage. Yield and precipitation for the quarter were below their respective quarterly long term averages. System withdrawal for the quarter was below the 10 year monthly average.



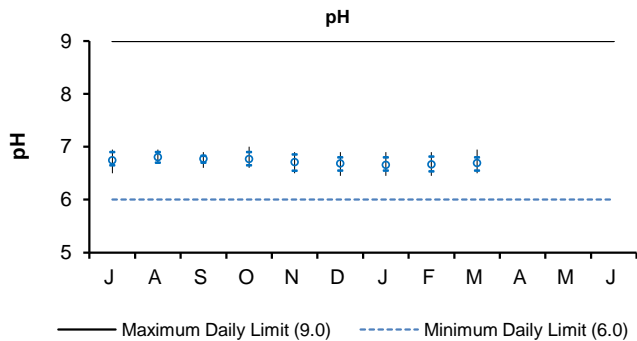
WASTEWATER QUALITY

NPDES Permit Compliance: Deer Island Treatment Plant 3rd Quarter - FY17

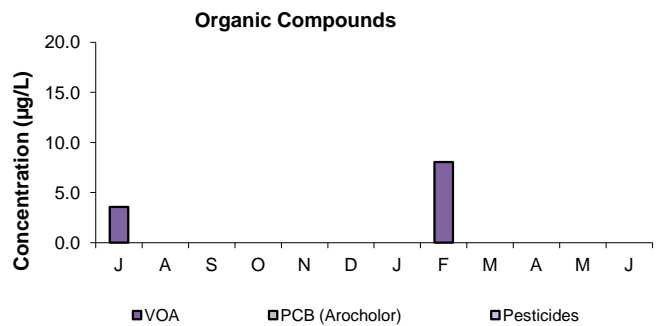
NPDES Permit Limits

Effluent Characteristics		Units	Limits	January	February	March	3rd Quarter Violations	FY17 YTD Violations
Dry Day Flow:		mgd	436	259.0	257.4	252.3	0	0
cBOD:	Monthly Average	mg/L	25	7.0	8.8	7.5	0	0
	Weekly Average	mg/L	40	8.2	10.6	8.7	0	0
TSS:	Monthly Average	mg/L	30	13.0	14.4	12.2	0	0
	Weekly Average	mg/L	45	19.3	16.3	15.3	0	0
TCR:	Monthly Average	ug/L	456	<40	<40	<40	0	0
	Daily Maximum	ug/L	631	<40	<40	<40	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	13	7	9	0	0
	Weekly Geometric Mean	col/100mL	14000	34	16	12	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	6.5-6.9	6.5-6.9	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	50	25	100	0	0
	Inland Silverside	%	≥1.5	100	50	100	0	0

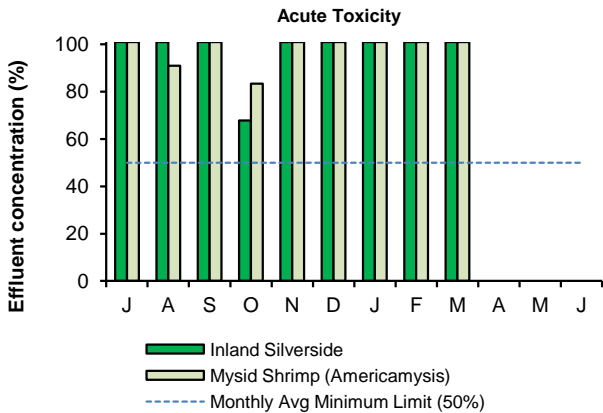
There have been no permit violations in FY17 to date at the Deer Island Treatment Plant.



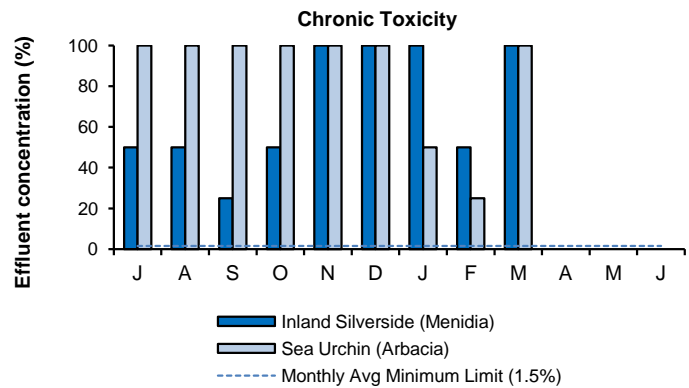
pH is a measure of alkalinity or acidity. Fluctuations in effluent pH are unlikely to impact on marine environments, which have significant buffering capacity. Because of the pure oxygen used in the activated sludge process, effluent pH tends to be at the lower end of the permit-required range. All pH measurements for the 3rd Quarter were within the daily permit limits.



An important wastewater component monitored in the effluent is organic compounds, such as volatile organic acids, pesticides, and polychlorinated biphenyls, which are all sampled monthly. The secondary treatment process significantly reduces organic compounds in the effluent stream. In the 3rd Quarter, some volatile organic compounds were detected in the effluent in February. All other organic compounds were below the detection limit for the quarter.



The acute toxicity test simulates the short-term toxic effects of chemicals in wastewater effluent on marine animals. The test measures the concentration (percent) of effluent that kills half the test organisms within four days. The higher the concentration of effluent required, the less toxic the effluent. For permit compliance, the effluent concentration that causes mortality to mysid shrimp and inland silverside must be at least 50%. Acute toxicity permit limits were met for the 3rd Quarter for both the inland silverside and mysid shrimp.



Typically, effects of chronic exposures differ from those of acute exposures. Because of this, chronic toxicity responses are not necessarily related to acute toxicity. The chronic toxicity test simulates the long-term toxic effects of chemicals in wastewater effluent on marine animals. To meet permit limits, a solution of 1.5% effluent and 98.5% dilution water must show no observed effect on the growth and reproduction of the test species. Chronic toxicity permit limits were met for the 3rd Quarter for both the inland silverside and sea urchin.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant
3rd Quarter - FY17

NPDES Permit Limits

Effluent Characteristics	Units	Limits	January	February	March	3rd Quarter	FY17 YTD	
			Violations	Violations	Violations	Violations		
Flow:	mgd	3.01	2.26	2.23	2.17	0	0	
BOD:	Monthly Average:	mg/L	20	2.6	4.2	4.9	0	0
	Weekly Average:	mg/L	20	2.9	5.0	6.7	0	0
TSS:	Monthly Average:	mg/L	20	3.9	5.8	6.8	0	0
	Weekly Average:	mg/L	20	5.2	6.5	8.6	0	0
pH:	SU	6.5-8.3	6.6-7.5	6.9-7.4	6.9-7.5	0	0	
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	9.8	9.5	9.6	0	0
Fecal Coliform:	Daily Geometric Mean:	col/100mL	400	3	7	N/A	0	0
	Monthly Geometric Mean:	col/100mL	200	3	3	N/A	0	0
E. Coli:	Daily Geometric Mean:	col/100mL	409	N/A	N/A	5	0	0
	Monthly Geometric Mean:	col/100mL	126	N/A	N/A	5	0	0
TCR:	Monthly Average:	ug/L	17.6	0.0	0.8	0.0	0	0
	Daily Maximum:	ug/L	30.4	0.0	22.5	0.0	0	0
Total Ammonia Nitrogen: November 1st - March 31st								
	Monthly Average:	mg/L	10.0	0.00	0.63	0.35	0	0
	Daily Maximum:	mg/L	35.2	0.00	2.13	1.01	0	0
Copper:	Monthly Average:	ug/L	11.6	5.0	8.0	6.0	0	0
Phosphorus: November 1st - March 31st								
	Monthly Average:	mg/L	N/A	0.29	N/A	0.43	0	0
Acute Toxicity:	Daily Minimum:	%	≥100	*N/A	*N/A	>100	0	0
Chronic Toxicity:	Daily Minimum:	%	≥62.5	*N/A	*N/A	25	1	1

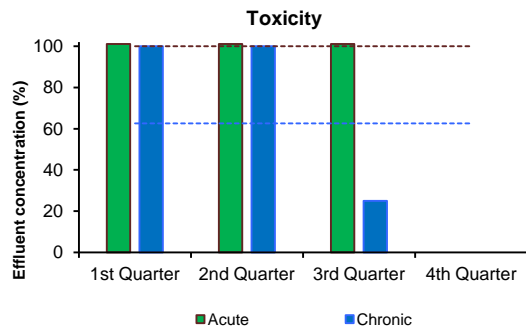
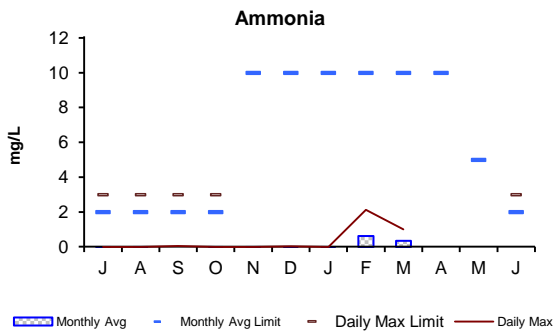
There has been one permit violation at the Clinton Treatment Plant in FY17. March 2017 is the first month under the new NPDES permit.

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

2nd Quarter: There were no permit violations in the second quarter.

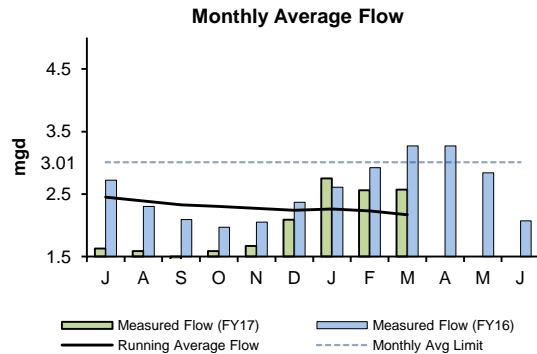
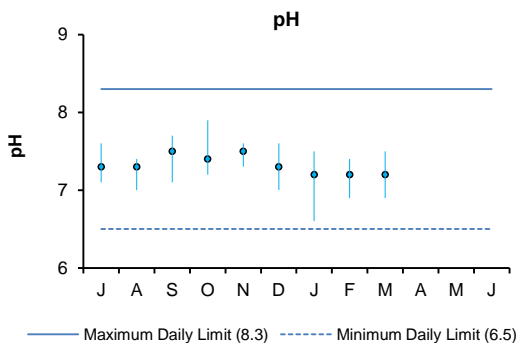
3rd Quarter: There was one permit violation in the third quarter; the chronic toxicity was 25%, which is below the permit limit of 62.5%

*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 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.

Acute and chronic toxicity testing simulates the short- and long-term toxic effects of chemicals in wastewater effluent on aquatic animals. For permit compliance, the effluent concentration that causes mortality to the daphnid in acute and chronic testing must be at least >100% and 62.5%, respectively. The chronic toxicity was below the permit limit in March 2017, and is therefore a violation in the third quarter.



pH is a measure of the alkalinity or acidity of the effluent. All daily pH results for the 3rd Quarter were within the range set by the permit.

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

COMMUNITY FLOWS AND PROGRAMS

Total Water Use

MWRA Revenue Customers

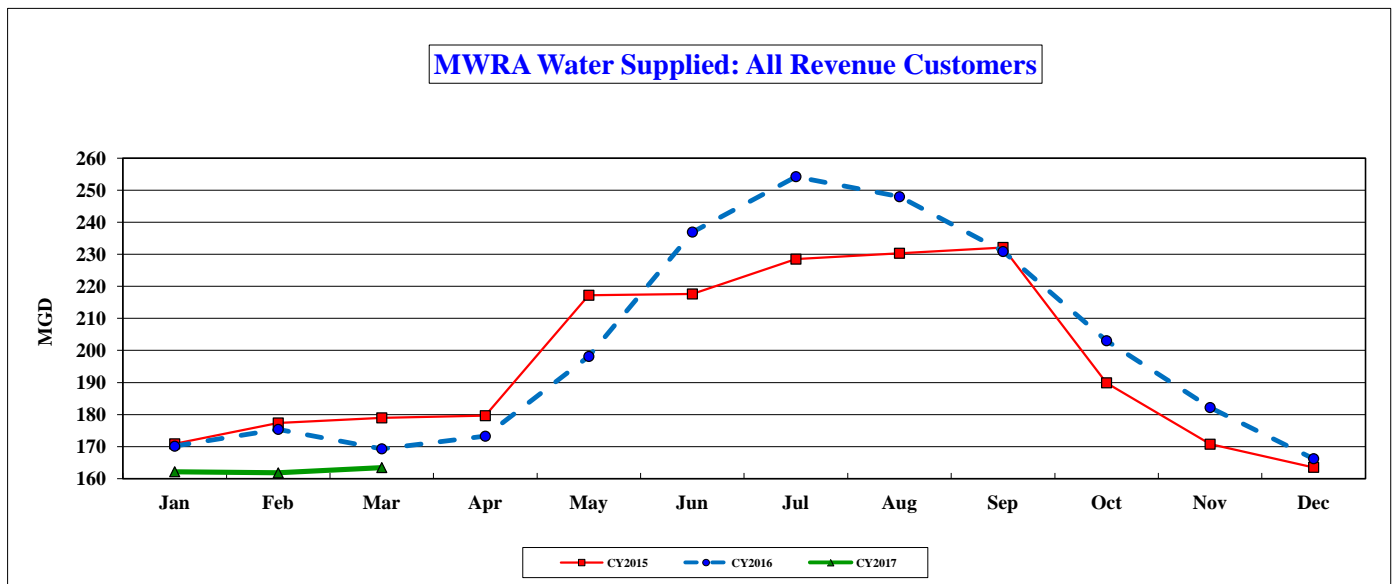
3rd Quarter - FY17

YTD CHANGES (CY17 vs. CY16)
Water Supplied
-6.3%

Water Supplied:
All Revenue Customers

MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2015	170.874	177.386	178.975	179.653	217.221	217.619	228.484	230.316	232.125	189.905	170.763	163.550	196.522	196.522
CY2016	170.144	175.389	169.319	173.256	198.133	236.921	254.203	247.944	230.859	203.031	182.197	166.245	171.534	200.718
CY2017	162.178	161.827	163.469	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	162.513	162.513

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Total	Annual Total
CY2015	5,297.089	4,966.801	5,548.216	5,389.596	6,733.842	6,528.559	7,082.997	7,139.787	6,963.760	5,887.062	5,122.884	5,070.040	71,730.633	71,730.633
CY2016	5,274.454	5,086.269	5,248.893	5,197.675	6,142.124	7,107.637	7,880.290	7,686.259	6,925.757	6,293.965	5,465.920	5,153.585	15,609.616	73,462.829
CY2017	5,027.511	4,531.154	5,067.537	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14,626.202	14,626.202



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

March 2017 water supplied of 163.5 mgd (for revenue generating users) is down 5.9 mgd or 3.5% compared to March 2016.

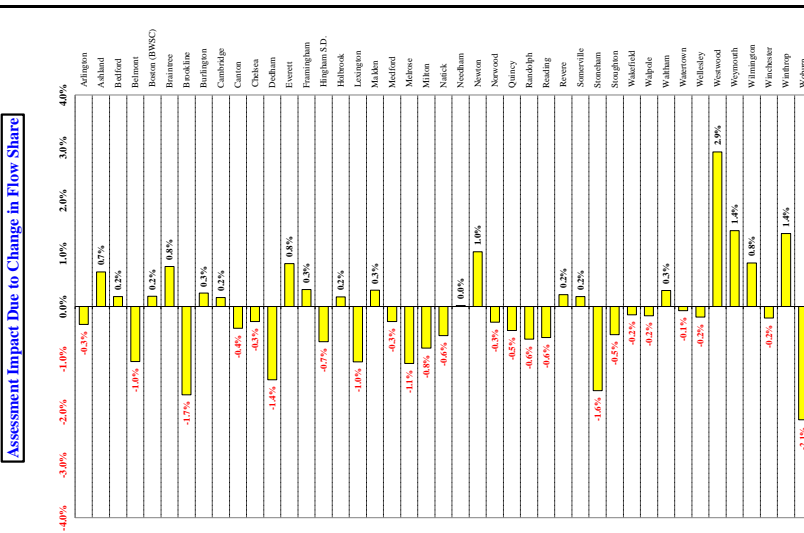
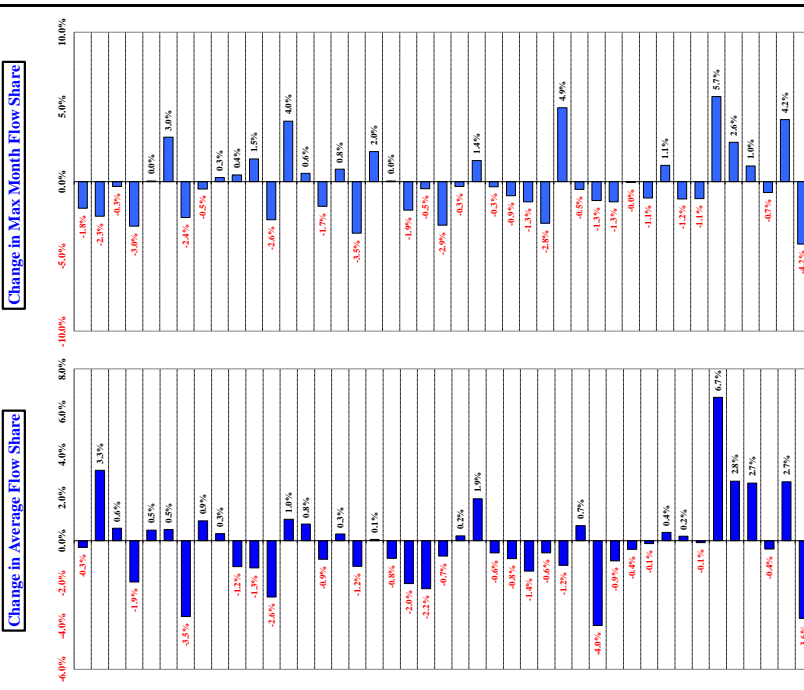
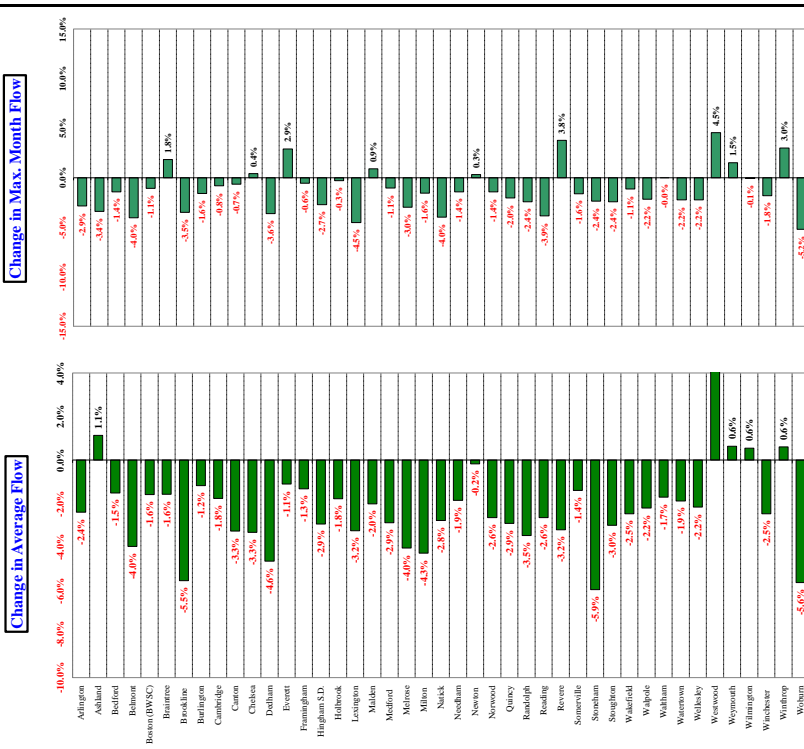
System-wide year to date consumption for CY17 is lower than CY16 with 162.5 mgd being supplied to MWRA customers **through March**. This is 9.0 mgd lower than CY16, and is a decrease of 5.3%.

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.



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

¹ MWRA uses a 3-year flow average to calculate sewer assessments. Three-year averaging smooths 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 04/1/10/17. 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.

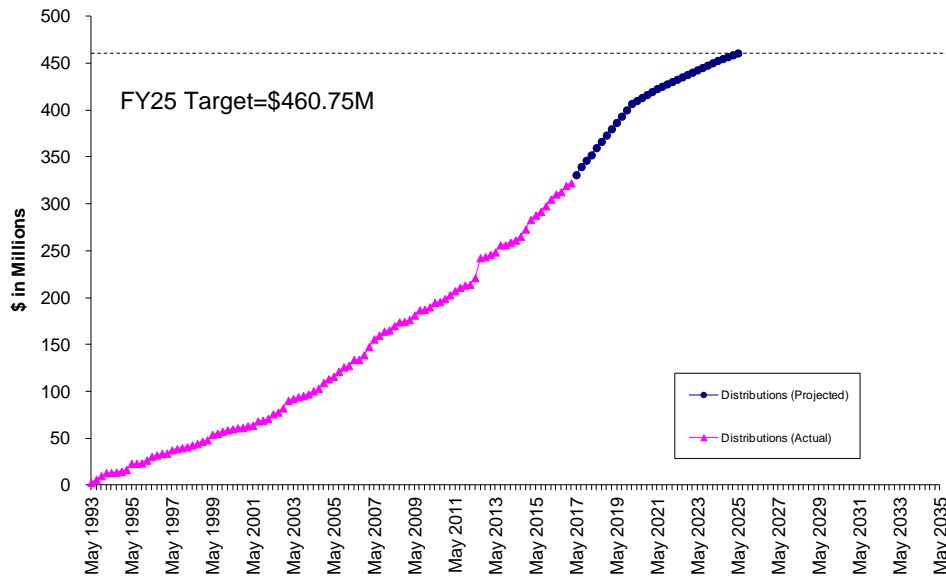
Community Support Programs

3rd Quarter – FY17

Infiltration/Inflow Local Financial Assistance Program

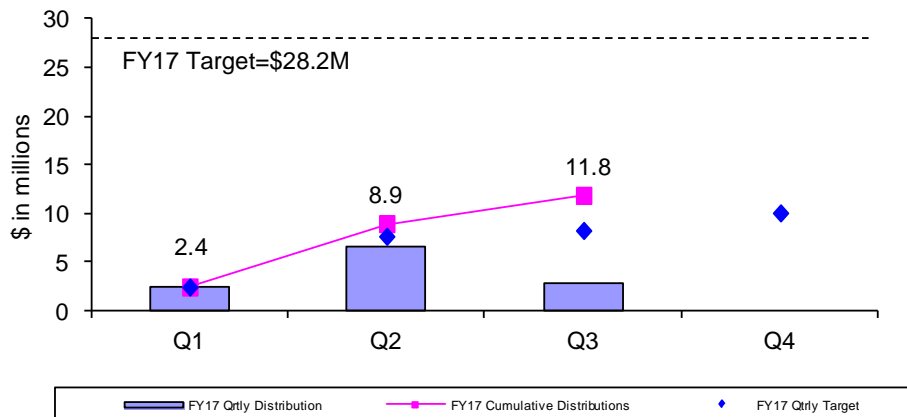
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides \$460.75 million in grants and interest-free loans (average of about \$14 million per year from FY93 through FY25) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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 FY17, \$2.9 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Arlington, Braintree, Norwood, Quincy, Stoughton and Weymouth. Total grant/loan distribution for FY17 is \$11.8 million. From FY93 through the 3rd Quarter of FY17, all 43 member sewer communities have participated in the program and more than \$322 million has been distributed to fund 524 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.

FY17 Quarterly Distributions of Sewer Grant/Loans



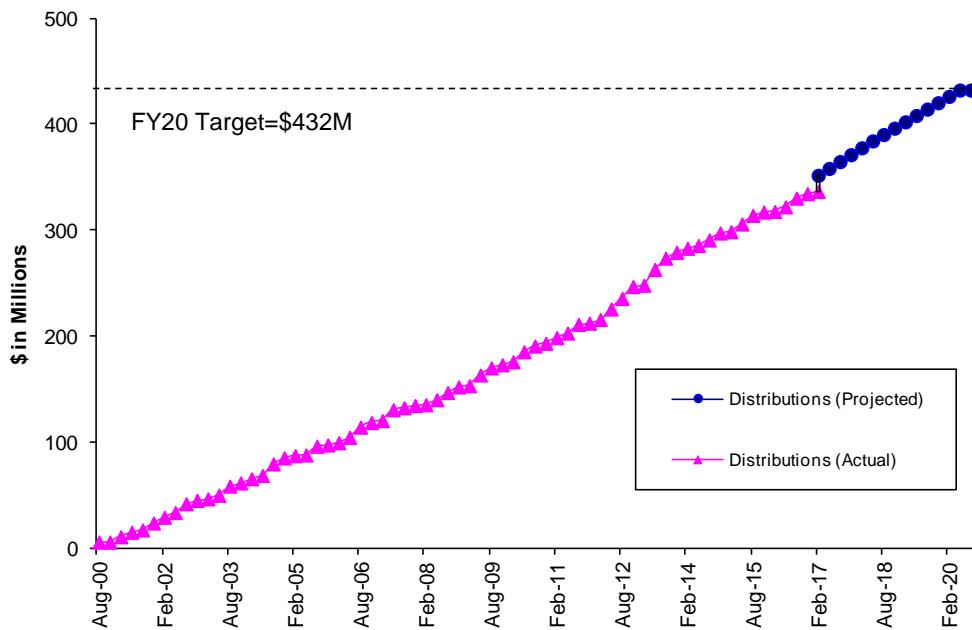
Community Support Programs

3rd Quarter – FY17

Local Water System Assistance Program

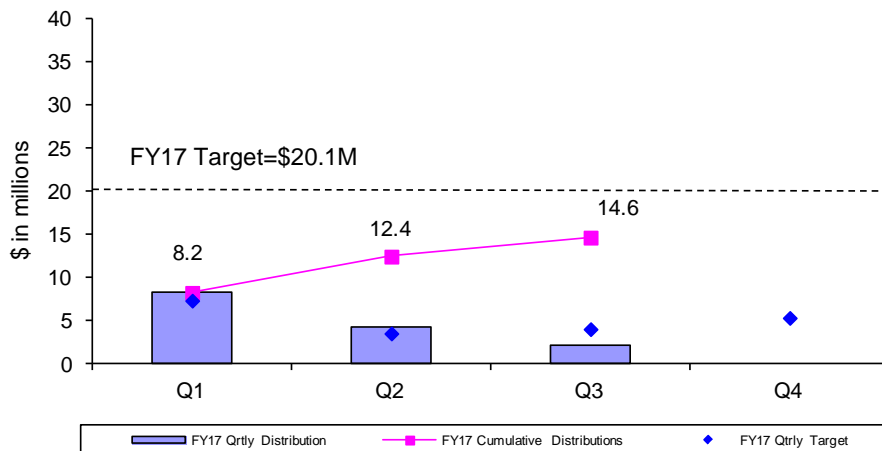
MWRA's Local Water System Assistance Programs (LWSAP) provides \$432 million in interest-free loans (an average of about \$22 million per year from FY01 through FY20) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. Eligible 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 FY20.

Local Water System Assistance Program Distribution FY01-FY20



During the 3rd Quarter of FY17, \$2.2 million in interest-free loans was distributed to fund local water projects in Somerville, Wakefield and Winchester. Total loan distribution for FY17 is \$14.6 million. From FY01 through the 3rd Quarter of FY17, more than \$336 million has been distributed to fund 380 local water system rehabilitation projects in 38 MWRA member water communities. Distribution of the remaining funds has been approved through FY20 and community loan repayments will be made through FY30. All scheduled community loan repayments have been made.

FY17 Quarterly Distributions of Water Loans



Community Support Programs

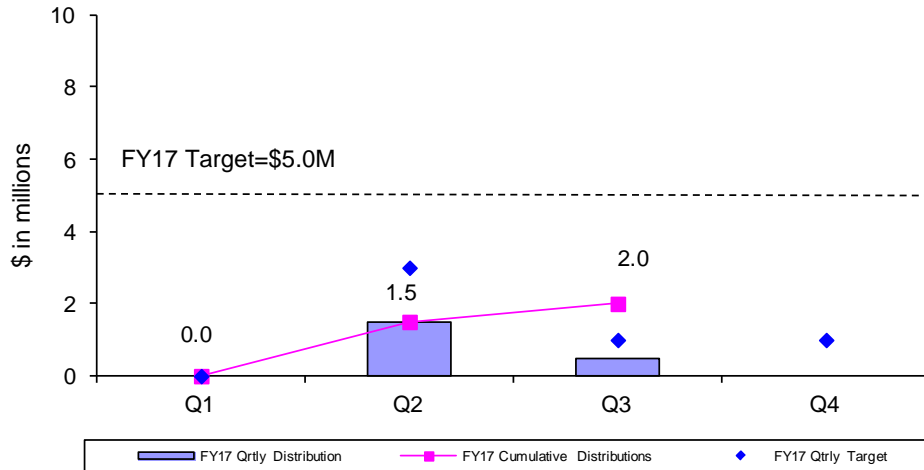
3rd Quarter – FY17

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 is the first year of the Lead Service Line Replacement Loan Program. During the 3rd Quarter of FY17, MWRA made the second Lead Loan Program distribution to Winchester for \$0.5 Million.

FY17 Quarterly Distributions of Lead Service Line Replacement Loans

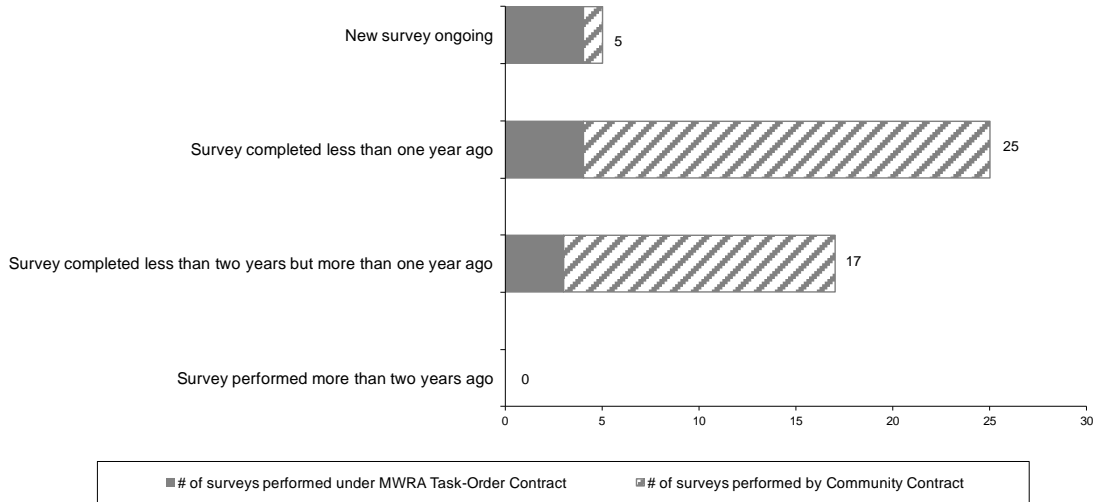


Community Support Programs

3rd Quarter – FY17

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 FY17, 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	324	20,778	73,882		94,984
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	3,162	1,944	3,972		9,078
Toilet Leak Detection Dye Tablets	-----	2,265	2,814	2,017		7,096

BUSINESS SERVICES

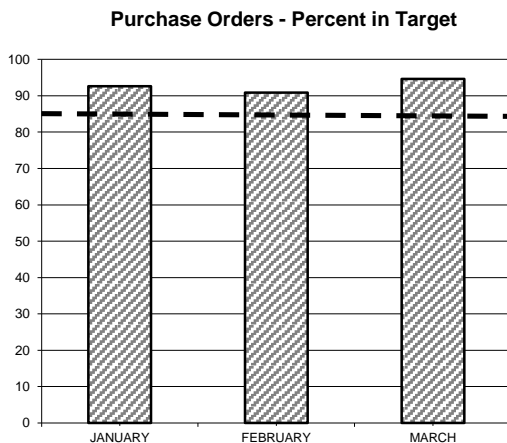
Procurement: Purchasing and Contracts

3rd Quarter - FY17

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

Outcome: Processed 93% of purchase orders within target; Average Processing Time was 4.37 days vs. 5.02 days in Qtr 3 of FY16. Processed 57 % (20 of 35) of contracts within target timeframes; Average Processing Time was 104 days vs. 133 days in Qtr 3 of FY16.

Purchasing



	No.	TARGET	PERCENT IN TARGET
\$0 - \$500	778	3 DAYS	91.9%
\$500 - \$2K	738	7 DAYS	97.1%
\$2K - \$5K	384	10 DAYS	95.6%
\$5K - \$10K	69	25 DAYS	100.0%
\$10K - \$25K	64	30 DAYS	91.6%
\$25K - \$50K	11	60 DAYS	66.6%
Over \$50K	19	90 DAYS	90.0%

The Purchasing Unit processed 2063 purchase orders, 356 less than the 2419 processed in Qtr 3 FY16 for a total value of \$7,471,984 versus a dollar value of \$13,156,591 in Qtr 3 FY16.

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

Contracts, Change Orders and Amendments

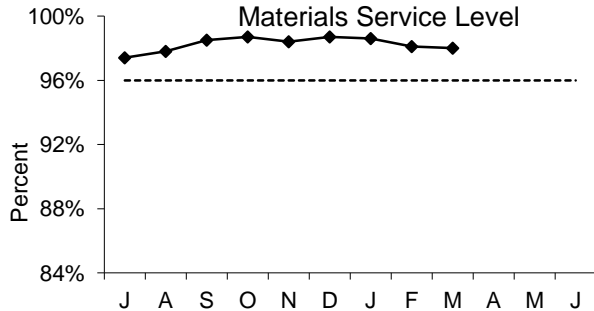
Fifteen contracts were not processed within the target timeframes. Eight contracts were not processed within the target timeframe due to delays by the consultants in providing insurance certificates and other contract related documents. For three contracts the procurement process was initiated early. However, services were in place according to schedule. One contract was delayed due to the extended time required to negotiate the engagement letter with the consultant. In addition, it took several weeks for the consultants to sign and return the contract for execution. Two additional contracts were delayed due to specification revisions. The final contract was not processed within the target timeframe due to a delay by the vendor in returning the signed contract in a timely manner.

Procurement processed thirty five contracts with a value of \$19,123,993 and eleven amendments with a value of \$3,495,177. Forty change orders were executed during the period. The dollar value of all non-credit change orders during Q3 FY17 was \$1,441,155 and the value of credit change orders was (\$532,577).

Staff reviewed 41 proposed change orders and 44 draft change orders.

Materials Management

3rd Quarter - FY17



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,353 (98.2%) of the 7,486 items requested in Q3 from the inventory locations for a total dollar value of \$1,360,403.

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 FY17 goal is to reduce consumable inventory from the July '16 base level (\$8.10 million) by 2.0% (approximately \$162,164), to \$7.94 million by June 30, 2017 (see chart below).

Items added to inventory this quarter include:

- Deer Island – seal kit, gaskets, sleeves, pressure control switches, air filters and pump seals for HVAC; adapter, clamps, actuator motor and couplings, filters and relays for Residuals; transducer, calibration gas, test kits and gas detector for I&C; air pressure regulators for Power & Pump; torches and tubing for Welding; headlamps for Facilities.
- Chelsea – shocks, power steering pumps, lug nuts and filters for Fleet Services; ink cartridges for Field Operations; pocket colorimeter for Metro Maintenance; pressure switches and flap valves for Work Order Coordination group.
- Southboro – pipe straps and gang boxes for Electrical; spot light and mop buckets for Maintenance.

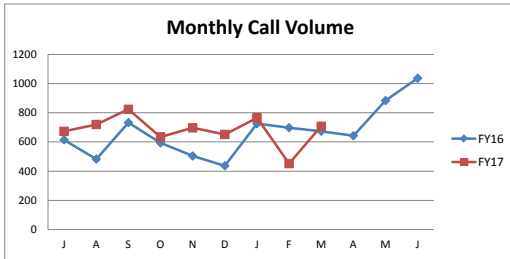
Property Pass Program:

- Eight audits were conducted during Q3.
- Scrap revenue received for Q3 amounted to \$9,500. Year to date revenue received amounted to \$24,903.
- Revenue received from online auctions held during Q3 amounted to \$40,429. Year to date revenue received amounted to \$214,236.

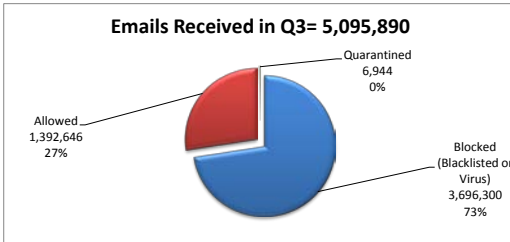
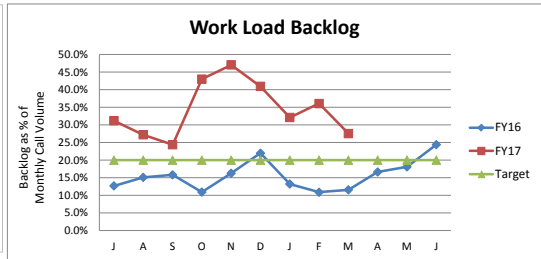
Items	Base Value July-16	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,108,240	7,919,794	-188,446
Spare Parts Inventory Value	8,841,332	8,853,996	12,664
Total Inventory Value	16,949,572	16,771,790	-177,782

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.

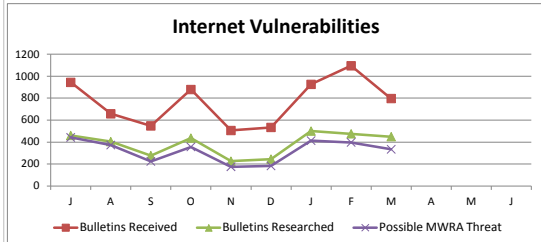
MIS Program
3rd Quarter - FY17



Performance & Backlog
Call Volume: Peaked in January. FY17-Q3 call volume decreased by 8% from FY16-Q3.
Call Backlog: Peaked in January. FY17-Q3 backlog average is 11.9% above the targeted benchmark of 20%.



Information Security
 In Q3, pushed security fixes/updates to desktops/servers protecting against 593 vulnerabilities. Landesk Antivirus quarantined 26 distinct viruses from 18 PCs. PCs are current with antivirus signatures for known malware.



Infrastructure:

Citrix Mobile Application Design and Development: Building virtual desktop infrastructure. Expanded use of Sharefile in Procurement.

Office 2016 Upgrade: A preliminary plan was created for the rollout beginning in July of 2017. User liaisons, from each department were identified to proactively test and identify any issues with macros and databases. Training needs have been identified and courseware development has been scheduled. Began testing Office 2016 products in Citrix environment. Drafted a Statement of Work and scheduled (May) a Microsoft resource to assist with remediation of migration issues encountered during the Office 2016 deployment.

Applications/Training/Records Center:

Miscellaneous Lawson Support: Tested and installed latest regulatory tax bulletins from BSI for 2017 tax tables across all Lawson servers. Uploaded the 1095c data file for 2016 to external vendor to publish and distribute the forms. Prepared and printed 1099 and W2 forms and sent electronic W2 files to the SSA and Massachusetts DOR. Began submitting electronic files using the new MARIS (Massachusetts Retirement Information System) interface.

Automatic Vehicle Location (AVL): The new application (NetworkFleet) went live in January. Scheduled and performed vendor vehicle installations and conducted six user training sessions. Data from the old system was archived.

Maximo Upgrade Project: Successful Go Live of Release-1 Maximo Version 7.6 to production. Approximately 200 reports put into production of which 28 are automatically run with recipients notified by email. Conducted functional testing of "Anywhere and Spatial" functionality and developed Training materials. Successfully migrated all Lawson Data to Maximo using Bulk load programs the weekend before January Go-Live. Successfully implemented all 51 interfaces between Lawson and Maximo.

Maximo Control Desk: Began reviewing and designing Service Catalog Management function and associated service category hierarchy which included conducting six brainstorming sessions with various MIS teams. Developed initial service offerings listings and attended a vendor demo on the out-of-box catalog features and underpinning service desk categories. Scrubbing current data in order to migrate into Control Desk (Assets, Service Requests, and Application-related data from the custom-built Application Configuration Tracking Application).

Electronic Library Notebook (ELN): Installed and configured ELN logbook for the Quabbin laboratory. Deployed new version of ELN Daily and Monthly Balance logs in the Chelsea and Quabbin facilities. The Daily Balance Calibration Check Log and the Monthly Balance Deflection Check Log were put into production.

Telog: Created a new web page hosted on Pipeline that allows staff to access the vendor-developed Telog Web Module that provides reports, trend analysis etc. on meters using three databases: water, wastewater and waterworks facility. The vendor customized the module allowing users read-only access without the need to use an additional login account. Beta testing was performed and the web page was rolled out in March.

Library & Records Center: The Library fulfilled 42 (135 YTD) research requests, and provided 248 (689 YTD) periodicals, standards, books and reports. Research topics included Metrowest tunnel design, algal blooms, earthen embankments effect, and estuarine and coastal modeling. The Records Center added 104 (529 YTD) boxes, handled 254 (1,019 YTD) boxes, disposed of 417 (1,346) boxes and attended one Records Conservation Board Meeting.

IT Training: For the quarter, 56 staff attended 10 classes. 49% of the workforce has attended at least one class year-to-date. 42 staff completed the Verizon NetworkFleet User training. As of March 31, 853 staff completed the Conflict of Interest Law training. Office 2016 training plan was developed. Two Maximo job-aids were developed and distributed: Logging In and Logging Out of Maximo and Updating Maximo Work Orders.

Legal Matters

3rd Quarter - FY 2017

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **Licenses:** Drafted four (4) one day DITP licenses. Reviewed electric service license for Chelsea Creek Headworks. Finalized license agreement related to Boston Gas's (NGRID) gas line and meters being installed at MWRA's Clinton Wastewater Treatment Plant. Reviewed First Amendment to NGRID Electric Service License for MWRA's Ware Disinfection Facility. Finalized Eversource Electric Service License related to installation of transformer at Alewife Brook Pump Station.
- **8(m) Permits:** Reviewed and approved sixty-three (63) 8(m) permits.
- **Watershed Preservation Restriction:** Reviewed Wachusett Reservoir Watershed Acquisition W-0001176 located at Campground Road in Sterling, MA.
- **Real Property:** Sent M.G.L. c. 79 §5C offers of purchase relative to two (2) temporary easements needed for MWRA Contract 7504 – Section 111 Southern Extra High Redundancy Pipeline – Dedham North. Recorded order of conditions (DEP File 338-0629) related to the portion of Contract 6453 - Section 111 Southern Extra High Redundancy Pipeline - Westwood. Reviewed MWRA property rights in Chestnut Hill Reservoir area. Recorded Certificate of Compliance for Order of Conditions DEP 081-1150 – Great Esker Marsh Restoration Project in Weymouth. Recorded Order of Conditions DEP 141-0509 for MWRA Contract No. 6453 – Section 111 Southern Extra High Redundancy Pipeline for work in Dedham. Recorded certificate of compliance for order of conditions (DEP File 176-035) related to MWRA Quabbin Power and Security Contract 7338. Drafted letter to the Town of Milton regarding the placement of a new Milton storm drain in the corridor where there is currently an abandoned MWRA 24-inch water main in Adams Street in Milton. Drafted letter to Malden Redeveloper concerning the construction schedule for MWRA Contract No. 6957 - Section 14 Water Pipeline Relocation (Malden). Reviewed draft easement plan related to the easement needed for the relocation of a portion MWRA's Northern High Service Pipeline Section 14 water main from Pleasant Street Extension to Pleasant Street in Malden. Reviewed easement plan for Fore River Shipyard relative to exchange of easements between March Fourth and MWRA. Drafted Letter of Intent related to exchange of easements in Fore River Shipyard by MWRA and March Fourth. Reviewed DCAMM legislation relative a transfer of a parcel of land in Chelsea from DCAMM to MWRA. Drafted letter to MADOT and DCR relative to the removal of debris stockpiled above, or in close proximity to, a portion of MWRA's City Tunnel Extension Distribution Water Line (Section 9-A) and MWRA's sewer interceptor (Section 106) adjacent to Mystic River Valley Parkway in Medford. Reviewed MWRA's property rights relative to 637 Boston Avenue in Medford and Mystic Valley Parkway in Medford.
- **NPDES:** Reviewed and provided comments on letter sent to EPA commenting on MWRA's Final Clinton Wastewater Treatment Plant NPDES Permit.
- **Public Records Request:** Responded to numerous public records requests. Asserted security exemption as to request for production of plans showing locations of key infrastructure sites.
- **Administrative Order - Docket No. 02-25 (Clinton Wastewater Treatment Plant):** Drafted and submitted a letter indicating that CWWTP is now in compliance with the revised copper limits in the final CWWTP NPDES Permit which became effective on March 1, 2017 and no longer requires interim copper limits.

Miscellaneous Assistance:

- **Stantec Cost Recovery Settlement:** Monitored deadline for tolling agreement in connection with receipt of cost recovery settlement agreement with Stantec.
- **Tying Issue/Chelsea Creek:** Assisted Procurement with anti-trust issue raised by contractor re: purchase of components for odor control and ejector systems; met with IG and AG representatives to evaluate merits of anti-trust tying arrangement.
- **Bond Issue:** Edited O/S to bring it into line with newest developments re: cross-harbor cable litigation and settlement options.
- **Irish Memorial Agreement:** Final comments to MOU re: installation maintenance and preservation of Irish Memorial planned for Deer Island.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

One demand for arbitration was filed.

LITIGATION/TRAC

New Matters

(Current Employee) v. MWRA: Plaintiff alleges age and gender discrimination against MWRA. The claim is now pending in Superior Court. Plaintiff seeks money damages, including costs and attorneys' fees.

Quinn Worker's Compensation Claim: Risk Management has requested that Law Division review a claim from a worker's compensation insurer for reimbursement from MWRA. On May 31, 2016, there was a motor vehicle accident in Weston involving an MWRA vehicle and another vehicle operated by Isabelle Quinn. Ms. Quinn sustained injuries, and received worker's compensation benefits through her employer. The insurer is now seeking reimbursement from MWRA, and the claim packet is currently under review.

Cach, LLC v. (Current Employee): This is a Wage Garnishment matter from the debtor to collect \$10,742.37. A Summons to Trustee was received on February 14, 2017.

Significant Claims

There are no Significant Claims.

Significant Developments

Bay State Regional Contractors, Inc. v. MWRA: This lawsuit arises out of the Gillis Pump Station Rehabilitation project in 2013-2014. The contractor has sued MWRA for alleged balances due and to undo an assessment of liquidated damages. On October 31, 2016, the Superior Court denied MWRA's Motion for Summary Judgment. The matter remains pending and in the discovery phase of the lawsuit. In a related matter, on December 29, 2016, MWRA entered an agreement to pay a direct payment claim to J.F. White, a subcontractor that Bay State had not paid. Bay State agreed to credit MWRA's payment to J.F. White against any payment or settlement of Bay State's claims. An offer of final settlement as to all of Bay State's claims has been communicated to Bay State's counsel.

United States v. NSTAR, HEEC and MWRA, C. A. 16-11470-RGS: Assisted outside counsel with preparation and conduct of eight (8) depositions; reviewed and commented upon revised Stipulation and Order from Army Corps and Massport; contacts with former MWRA employees and forwarded documents to assist in deposition preparation for three witnesses; concluded agreement with key MWRA witness to assist as fact witness as necessary; continued to advise Operations staff re: impacts of potential damage claims re: back-up generation; attended meetings with parties seeking consensus on technical requirements for cable protection work.

Closed Cases

DOC v. MWRA v. Allied Locke: This action arises out of MWRA Contract 6899, Primary and Secondary Clarifier Rehabilitation, Deer Island Treatment Plant, under which Plaintiff Daniel O'Connell's Sons, Inc., rehabilitated 102 primary and secondary clarifiers at DITP. Plaintiff sought money damages in the amount of \$3,368,567.57, plus interest, costs, and attorney's fees in addition to the additional costs associated with making modifications to the head shaft driven sprockets ("bull sprockets") in the primary and secondary clarifiers at DITP. MWRA initiated a third-party lawsuit against Allied-Locke Industries, Inc. in which that company was joined as an additional party to the pending litigation brought by O'Connell's and Sons against MWRA in December, 2013. In late December 2016, following Board authorization to settle, this matter was settled for a payment to O'Connell for \$2.65 million. A memorandum agreement was signed on December 22, 2016 and the settlement was completed in January 2017.

Subpoenas

During the Third Quarter of FY 2017, one new subpoena was received and no subpoenas were pending at the end of the Third Quarter FY 2017.

Public Records

During the Third Quarter of FY 2017, twenty five public records requests were received and fourteen public records requests were closed.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of Mar 2017	As of Dec 2016	As of Sept 2016
Construction/Contract/Bid Protest (other than BHP)	2	3	3
Tort/Labor/Employment	2	1	1
Environmental/Regulatory/Other	2	2	2
Eminent Domain/Real Estate	0	0	0
total – all defensive cases	6	6	6
Other Litigation matters (restraining orders, etc.) <u>MWRA v. Thomas Mercer</u> <u>MWRA v. NSTAR and HEEC</u>	2	2	2
total – all pending lawsuits	8	8	8
Claims not in suit: <u>Joel Chiet Claim</u> <u>Besnick Lalaj and Violeta Lalaj Claim</u> <u>Thang Viet Vu and Oanh Vu Claim</u>	3	3	0
Bankruptcy	1	1	2
Wage Garnishment	15	14	14
TRAC/Adjudicatory Appeals	3	0	2
Subpoenas	0	0	0
TOTAL – ALL LITIGATION MATTERS	30	26	26

TRAC/MISC.

New Appeals: Three new TRAC appeals were received in March 2017.

Smokehouse, Inc. MWRA Docket No. 17-01.
Constitution Seafood; MWRA Docket No. 17-02.
City Fresh Foods, MWRA Docket No. 17-03.

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

Stipulation of Dismissal No Stipulation of Dismissals.

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

Tentative Decision No Tentative Decisions were issued in the 3rd Quarter FY 2017.

Final Decisions No Final Decisions was issued in the 3rd Quarter FY 2017.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES 3rd Quarter FY17

Highlights

During the 3rd quarter, Internal Audit (IA) completed an audit of the Deer Island purchase card program. The areas reviewed included compliance with procedures described in the Cardholder User Manual and a review of the manual itself. A number of recommendations were made to strengthen procedures and controls of which five were implemented before the issue of the report.

In addition, 3 preliminary consultant reviews and six construction labor burden reviews were completed. Management advisory services included analyses of design contract estimates compared to awards, FMLA, employee age demographics and succession planning.

Status of Recommendations

There were 40 recommendations made in FY17 and 19 of these have been closed year to date. An additional 21 recommendations were closed from prior fiscal year 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 acted on within 48 months, the appropriateness of the recommendation is re-evaluated during a subsequent audit. On closed assignments 98% of recommendations have been implemented.

Report Title (issue dates)	Audit Recommendations		
	Total	Closed	Open
Hardware Equipment Management Report (5/22/13)	36	32	4
Follow-Up Report on Fleet Services Activities (12/31/13)	17	16	1
Records Management (12/5/14)	8	7	1
Unmatched Receipts and Accruals (6/30/15)	10	5	5
Warehouse Cycle Counts at DITP (11/5/15), Southboro (11/6/15) and Chelsea (12/4/15)	25	21	4
Security System Alarms (3/3/16)	3	1	2
AVL Tracking 2016 (5/6/16)	9	8	1
MIS Mobile Equipment Asset Tracking (9/26/16)	12	11	1
Wright Express (WEX) Fuel Card Purchases (11/16/16)	13	3	10
Purchase Card Activity on Deer Island (3/31/17)	15	5	10
Total Recommendations	148	109	39

Cost Savings

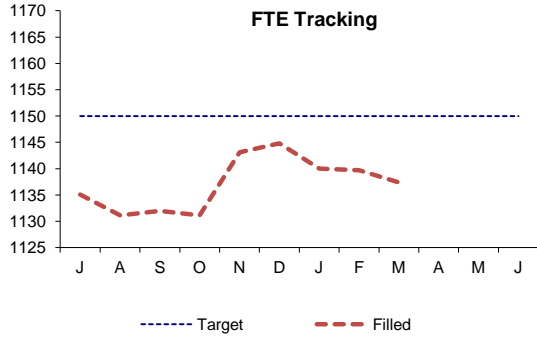
IA's target is to achieve at least \$1 million in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of work in prior years.

Cost Savings	FY13	FY14	FY15	FY16	FY17 (3Q)	TOTAL
Consultants	\$587,314	\$294,225	\$87,605	\$88,312	\$235,949	\$1,293,405
Contractors & Vendors	\$2,153,688	\$415,931	\$1,146,742	\$1,772,422	\$2,417,312	\$7,906,095
Internal Audits	\$391,083	\$923,370	\$543,471	\$220,929	\$166,815	\$2,245,668
Total	\$3,132,085	\$1,633,526	\$1,777,818	\$2,081,663	\$2,820,076	\$11,445,168

OTHER MANAGEMENT

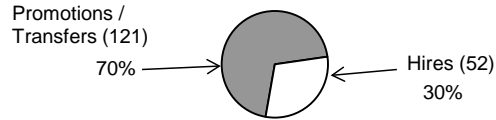
Workforce Management

3rd Quarter - FY17



FY17 Target for FTE's = 1150
 FTE's as of March 2017 = 1137.4

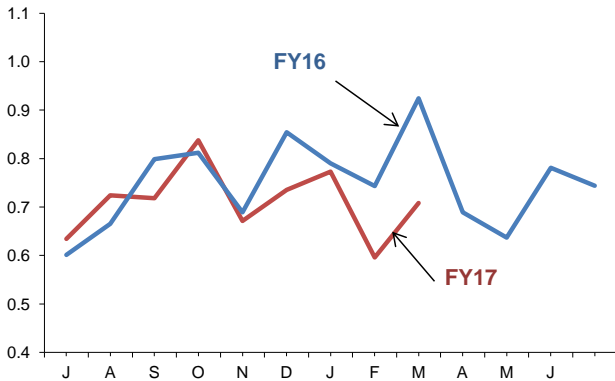
Positions Filled by Hires/Promotions
 FY17-YTD



	Pr/Trns	Hires	Total
FY14	111 (69%)	51 (31%)	162
FY15	133 (67%)	65 (33%)	198
FY16	99 (62%)	60 (38%)	159
FY17	121 (70%)	52 (30%)	173

In Q3 of FY17, the average quarterly sick leave usage decreased 4.7% from the same time last year.

Average Monthly Sick Leave Usage
 Per Employee

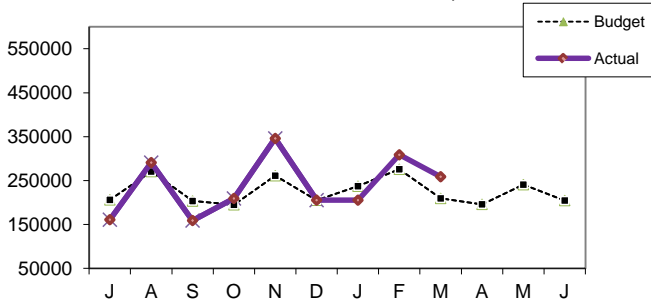


Average monthly sick leave for the 3rd Quarter of FY17 decreased as compared to the 3rd Quarter of FY16 (9.83 to 8.31 days)

	Number of Employees		Annualized Total	Annual FMLA %	
Admin	137	5.82	7.76	13.1%	8.29
Aff. Action	5	4.53	6.04	0.0%	8.05
Executive	5	12.61	16.82	52.6%	10.97
Finance	34	6.64	8.86	34.2%	9.70
Int. Audit	7	4.85	6.46	63.9%	4.44
Law	14	6.87	9.15	7.7%	11.41
OEP	8	4.19	5.59	37.6%	6.62
Operations	934	6.49	8.66	17.0%	9.06
Pub. Affs.	14	4.94	6.58	7.0%	9.16
MWRA Avg	1158	6.40	8.53	17.4%	8.99

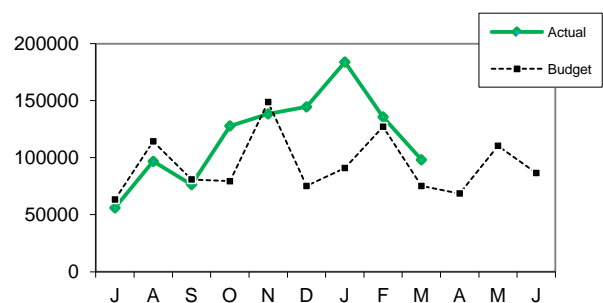
Percent of sick leave usage for FY17, attributable to Family and Medical Leave Act (FMLA) is 17.4% .

Field Operations
 Current Month Overtime \$



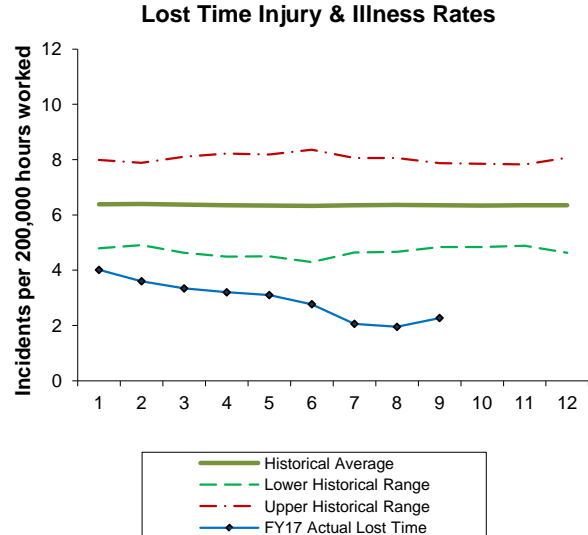
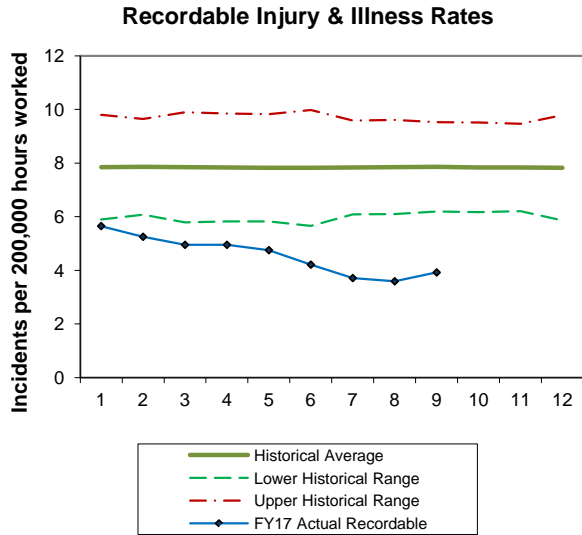
Total Overtime for Field Operations for the Third Quarter of FY17 was \$772,822 which is \$50k over budget. Emergency overtime was \$367k, which was \$34k under budget. Rain events totaled \$135, emergency maintenance was \$54k, emergency operations was \$21k, and snow removal was \$125k. Coverage overtime was \$149k, which was \$15k over budget, reflecting the shift coverage requirements for the quarter. Planned overtime was \$257k or \$1k over budget. Spending for the quarter includes maintenance off-hours work at \$87k, maintenance work completion at \$23k, Planned operations at \$47k, half-plant at Carroll at \$47k. YTD, FOD has spent \$2,144,473 on overtime which is \$81k over budget.

Deer Island Treatment Plant
 Current Month Overtime \$



Total overtime for Deer Island for the third quarter of FY17 \$418K, which was \$124K over budget. A combination of planned/unplanned overtime which was \$115K over budget mainly due to maintenance and operations activities involving the Eversource cable outage and higher shift coverage overtime, \$63K over budget, due to a 3rd Class Engineer on IA and several vacant operator positions. This is offset in part by, less than anticipated storm coverage overtime, (\$57K) or (930) fewer hours. YTD, Deer Island has spent \$1,057,828 on overtime which is \$202K over budget.

Workplace Safety 3rd Quarter - FY17



- 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		Open Claims
	New	Closed	
Lost Time	6	14	60
Medical Only	19	36	23
Report Only	22	22	
	QYTD		FYTD
Regular Duty Returns	8		18
Light Duty Returns	2		6

COMMENTS:

Regular Duty Returns

JAN: One employee returned to regular duty from IA
 FEB: Four employees returned to regular duty from IA
 MARCH: Three employees returned to regular duty from IA

Light Duty Returns

JAN: One employee returned to light duty from IA
 FEB: One employee returned to light duty from IA
 MARCH: No employees returned to light duty from IA

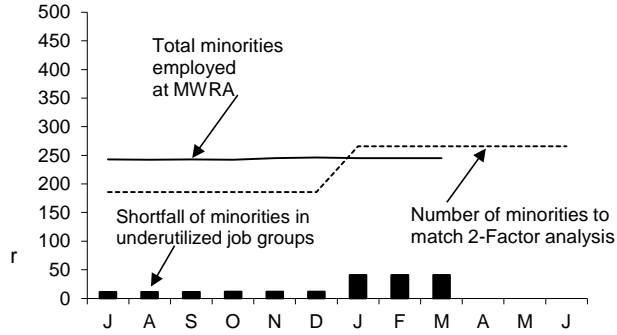
Note: Claims may initially be counted in one category and changed to another category at a later date. Examples include a medical treatment only claim (no lost time from work) but the employee may require surgery at a later date resulting in the claim becoming a lost time claim. At that time we would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

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

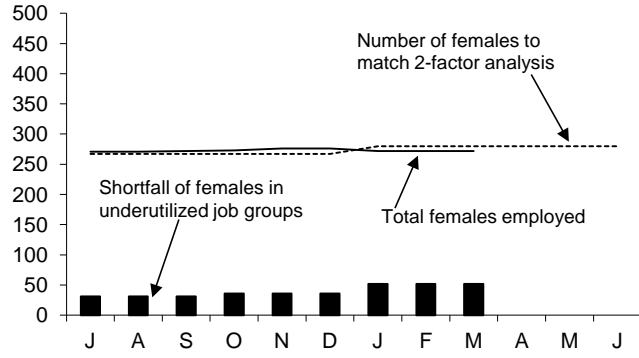
MWRA Job Group Representation

3rd Quarter - FY17

Minority - Affirmative Action Plan Goals



Female - Affirmative Action Plan Goals



Highlights:

At the end of Q3 FY17, 9 job groups or a total of 41 positions are underutilized by minorities as compared to 5 job groups or a total of 13 positions at the end of Q3 FY16; for females 7 job groups or a total of 52 positions are underutilized by females as compared to 11 job groups or a total of 36 positions at the end of Q3 FY16. During Q3, 1 minority and 2 females were hired. During this same period 2 minorities and 5 females terminated. Effective February 15, 2017, The Board of Directors approved the 2017 Affirmative Action's workforce goals. The new goals are the following: minorities 23.0 % and females 24.1%

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	2	0	6	6	0
Administrator B	19	1	3	-2	4	6	-2
Clerical A	33	12	9	3	14	32	-18
Clerical B	30	8	7	1	9	15	-6
Engineer A	81	21	18	3	17	12	5
Engineer B	57	16	13	3	6	7	-1
Craft A	114	19	27	-8	8	7	1
Craft B	145	28	32	-4	8	4	4
Laborer	67	18	15	3	3	3	0
Management A	97	13	24	-11	40	25	15
Management B	47	10	7	3	6	12	-6
Operator A	69	4	11	-7	3	9	-6
Operator B	64	12	13	-1	18	1	17
Professional A	34	5	8	-3	16	14	2
Professional B	162	46	43	3	54	67	-13
Para Professional	59	17	21	-4	51	32	19
Technical A	52	12	11	1	12	10	2
Technical B	7	1	2	-1	2	2	0
Total	1158	245	266	20/-41	277	264	65/-52

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/ Transfers	AACU Ref. External	Position Status
Administrator B	Assistant Director, Internal Audit	1	Int	1	0	Promo = WF
Craft A	Valve Maintenance Foreman	1	Int	1	0	Promo = WM
Craft A	M&O Specialist	2	Int/Ext	1	0	NH = HM; T = WM
Craft A	Valve General Foreman	1	Int	1	0	Promo = WM
Craft A	Trades Foreman	1	Int	1	0	Promo = WM
Craft B	HVAC Technician	1	Int/Ext	0	0	NH = WM
Craft B	Medium Voltage Electrical Specialist	1	Int	1	0	Promo = WM
Craft B	Heavy Equipment Operator I	3	Int	1	0	(3)Promo = WM
Clerical A	Executive Secretary	1	Int	1	0	Promo = WF
Clerical B	Secretary II	1	Int	1	0	Promo = WF
Engineer A	Principal Civil Engineer	1	Int	1	0	Promo = WM
Engineer B	Project Manager	1	Int	1	0	Promo = WF
Engineer B	Project Manager, Process Monitoring	1	Int	1	0	Promo = WM
Laborers	Building & Grounds Worker	1	Int/Ext	0	0	NH = WM
Management A	Deputy Contracts Manager	1	Int/Ext	0	1	In Progress
Professional B	Financial Planner	1	Int/Ext	0	0	NH = WM
Professional B	Account Coordinator	1	Int	0	0	Promo = WM
Professional B	Senior Laboratory Technician	1	Int/Ext	0	1	Rehire = WF
Professional B	Senior Human Resources Analyst	1	Int	1	0	Promo = WF
ParaProfessional	Administrative Systems Coordinator	1	Int	1	0	Promo = WF
Technical A	CADD Manager	1	Int	1	0	Promo = WF
Technical B	Water Quality Technician	1	Int/Ext	0	1	NH = WF

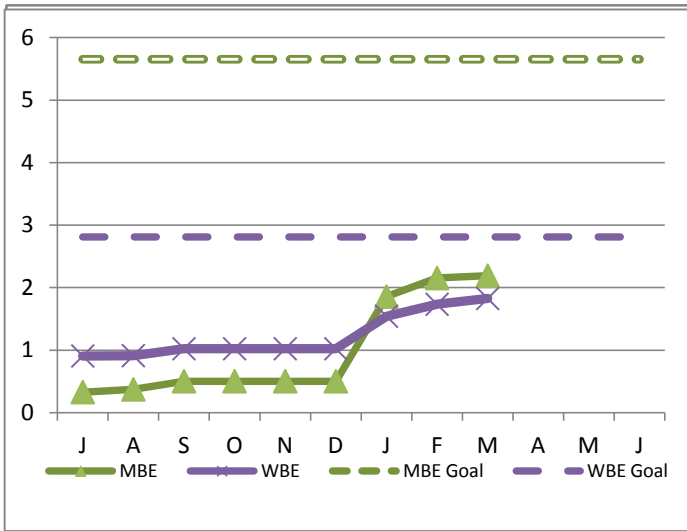
MBE/WBE Expenditures

3rd Quarter - FY17

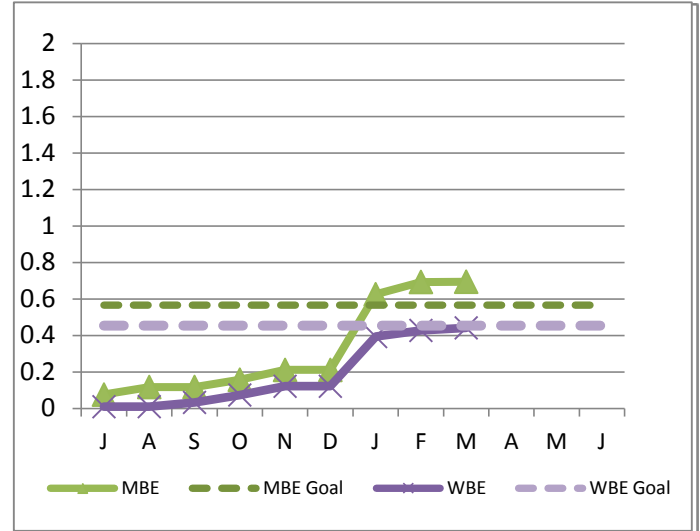
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY17 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they 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 March.

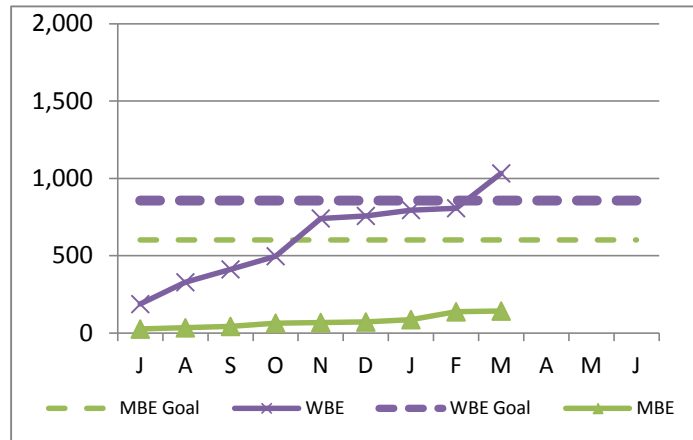
Construction



Professional Services



Goods/Services



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

MBE			
FY17 YTD		FY16	
Amount	Percent	Amount	Percent
2,190,290	38.7%	1,805,604	37.9%
694,439	122.8%	828,841	55.3%
142,021	23.6%	255,324	40.6%
3,026,750	44.4%	2,889,769	41.9%

WBE			
FY17 YTD		FY16	
Amount	Percent	Amount	Percent
1,825,842	64.9%	1,114,916	47.1%
441,492	97.2%	314,752	26.1%
1,032,219	120.7%	1,124,374	160.7%
3,299,553	80.1%	2,554,042	59.8%

Construction
Prof Svcs
Goods/Svcs
Totals

FY16 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

MWRA FY17 CEB Expenses
3rd Quarter – FY17

	March 2017 Year-to-Date					
	Period 9 YTD Budget	Period 9 YTD Actual	Period 9 YTD Variance	%	FY17 Approved	% Expended
EXPENSES						
WAGES AND SALARIES	\$ 73,142,901	\$ 70,658,182	\$ (2,484,719)	-3.4%	\$ 101,588,897	69.6%
OVERTIME	3,190,876	3,444,721	253,845	8.0%	4,192,676	82.2%
FRINGE BENEFITS	15,064,014	14,558,834	(505,180)	-3.4%	20,242,323	71.9%
WORKERS' COMPENSATION	1,758,143	2,277,351	519,208	29.5%	2,344,190	97.1%
CHEMICALS	6,702,165	6,914,223	212,058	3.2%	9,110,407	75.9%
ENERGY AND UTILITIES	16,169,863	15,185,757	(984,106)	-6.1%	21,541,077	70.5%
MAINTENANCE	22,278,441	22,236,896	(41,545)	-0.2%	31,080,642	71.5%
TRAINING AND MEETINGS	318,407	248,146	(70,261)	-22.1%	435,481	57.0%
PROFESSIONAL SERVICES	4,607,284	4,595,653	(11,631)	-0.3%	6,531,939	70.4%
OTHER MATERIALS	2,987,160	3,226,178	239,018	8.0%	6,219,630	51.9%
OTHER SERVICES	16,890,745	15,924,711	(966,034)	-5.7%	22,974,855	69.3%
TOTAL DIRECT EXPENSES	\$ 163,109,999	\$ 159,270,652	\$ (3,839,347)	-2.4%	\$ 226,262,117	70.4%
INDIRECT EXPENSES						
INSURANCE	1,498,423	1,330,106	(168,317)	-11.2%	1,997,898	66.6%
WATERSHED/PILOT	18,218,451	18,089,080	(129,371)	-0.7%	24,291,268	74.5%
BEC _o PAYMENT	580,394	590,286	9,892	1.7%	773,859	76.3%
MITIGATION	1,168,500	1,157,100	(11,400)	-1.0%	1,558,000	74.3%
ADDITIONS TO RESERVES	(125,807)	(125,807)	-	0.0%	(167,742)	75.0%
RETIREMENT FUND	4,632,624	4,632,624	-	0.0%	4,632,624	100.0%
POST EMPLOYEE BENEFITS	-	-	-	---	4,876,050	0.0%
TOTAL INDIRECT EXPENSES	\$ 25,972,585	\$ 25,673,389	\$ (299,196)	-1.2%	\$ 37,961,957	67.6%
DEBT SERVICE						
STATE REVOLVING FUND	\$ 62,365,832	\$ 60,601,451	\$ (1,764,381)	-2.8%	\$ 86,971,915	69.7%
SENIOR DEBT	199,948,307	198,248,067	(1,700,240)	-0.9%	268,472,556	73.8%
CORD FUND	-	-	-	---	-	---
DEBT SERVICE ASSISTANCE	-	-	-	---	(873,804)	---
CURRENT REVENUE/CAPITAL	9,150,000	9,150,000	-	0.0%	12,200,000	75.0%
SUBORDINATE MWRA DEBT	50,930,327	50,930,327	-	0.0%	69,997,992	72.8%
LOCAL WATER PIPELINE CP	3,111,931	3,111,931	-	0.0%	4,149,242	75.0%
CAPITAL LEASE	2,412,795	2,412,795	-	0.0%	3,217,060	75.0%
DEBT PREPAYMENT	-	-	-	---	10,994,960	0.0%
VARIABLE DEBT	-	(8,270,383)	(8,270,383)	---	-	0.0%
DEFESANCE ACCOUNT	-	11,735,004	11,735,004	---	-	0.0%
TOTAL DEBT SERVICE	\$ 327,919,192	\$ 327,919,192	\$ -	0.0%	\$ 455,129,921	72.0%
TOTAL EXPENSES	\$ 517,001,776	\$ 512,863,233	\$ (4,138,543)	-0.8%	\$ 719,353,995	71.3%
REVENUE & INCOME						
RATE REVENUE	\$ 521,158,875	\$ 521,158,875	\$ -	0.0%	\$ 694,878,500	75.0%
OTHER USER CHARGES	6,418,831	6,486,897	68,066	1.1%	8,752,834	74.1%
OTHER REVENUE	5,234,429	10,668,844	5,434,415	103.8%	6,519,171	163.7%
RATE STABILIZATION	-	-	-	---	-	---
INVESTMENT INCOME	6,818,279	6,663,050	(155,229)	-2.3%	9,473,490	70.3%
TOTAL REVENUE & INCOME	\$ 539,630,414	\$ 544,977,666	\$ 5,347,251	1.0%	\$ 719,623,995	75.7%

As of March 2017, total expenses are \$512.9 million, \$4.1 million or 0.8% lower than budget, and total revenue is \$545.0 million, \$5.4 million or 1.1% over budget, for a net variance of \$9.5 million.

Expenses –

Direct Expenses are \$159.3 million, \$3.8 million or 2.4% below budget.

- **Wages & Salaries** are under budget by \$2.5 million or 3.4%. At the end of March, the average Full Time Equivalent (FTE) positions were 1,137, 13 positions fewer than the 1,150 budgeted FTE's.
- **Other Services** are under budget by \$966k or 5.7% mainly due to lower Sludge Pelletization expenses of \$356k reflecting lower year to date quantities, lower Lease/Rentals of \$220k due to lower escrow payments at the Chelsea Facility for taxes and insurance, and lower pass through maintenance cost at the Charlestown Navy Yard Facility, \$177k for Other Services, and \$155k for Grit and Screenings disposal services primarily due to lower quantities.
- **Utilities** are under budget by \$984k or 6.1% mainly due to lower than budgeted electricity costs of \$1.3 million at Deer Island, due to lower electricity prices than budgeted and reduced purchased electricity during HEEC related self-generation, partially offset by \$255k in additional diesel for fuel for CTG operations during HEEC cable work.
- **Workers** Compensation expenses are higher than budgeted by \$519k or 29.5%. Reserves for two claims increased \$440,000 in March.
- **Fringe Benefits** are under budget by \$505k or 3.4% mainly due to fewer than budgeted participants.
- **Overtime** expenses are higher than budgeted by \$254k or 8.0% mainly at the Deer Island Treatment Plant for the HEEC cable location project by Eversource and for off-hours maintenance projects primarily for Field Operations Metro Maintenance.
- **Other Materials** were higher than budget by \$239k or 8.0% mainly due to timing of Vehicle Purchases of \$397k; Lab & Testing Supplies of \$98k; Other Materials of \$64k primarily for gravel at the Clinton Landfill; and Health & Safety of \$43k. This is offset by lower Vehicle Expenses of \$208k due to lower than budgeted fuel prices; Equipment/Furniture of \$56k; Postage of \$43k due to timing of refilling postage meters in the mail room, and Computer Software of \$37k.

Indirect Expenses are \$25.7 million, \$299k under budget or 1.2%. Insurance Claims and Watershed Reimbursements are under budget by \$168k and \$129k, respectively.

Debt Service Expenses totaled \$327.9 million, which matched budget after the transfer of \$11.7 million year-to-date favorable variance to the Defeasance account. The variable rate savings account for \$8.3 million and \$3.4 million for savings related to the August 2016 refunding, lower SRF funding than planned, and planning to borrow the senior debt in May versus in January.

Revenue and Income –

Total Revenue / Income is \$545.0 million, \$5.3 million higher than budget, primarily for non-rate revenue including \$4.8 million for water sales related to the summer drought and \$299k for a favorable class action settlement related to derivatives, \$254k for the gains on sale of surplus equipment, and \$184k for energy efficiency incentives from the utility companies, partially offset by lower investment Income of \$155k due to unexpected calls and lower reinvestment rates.

Cost of Debt

3rd Quarter – FY17

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.

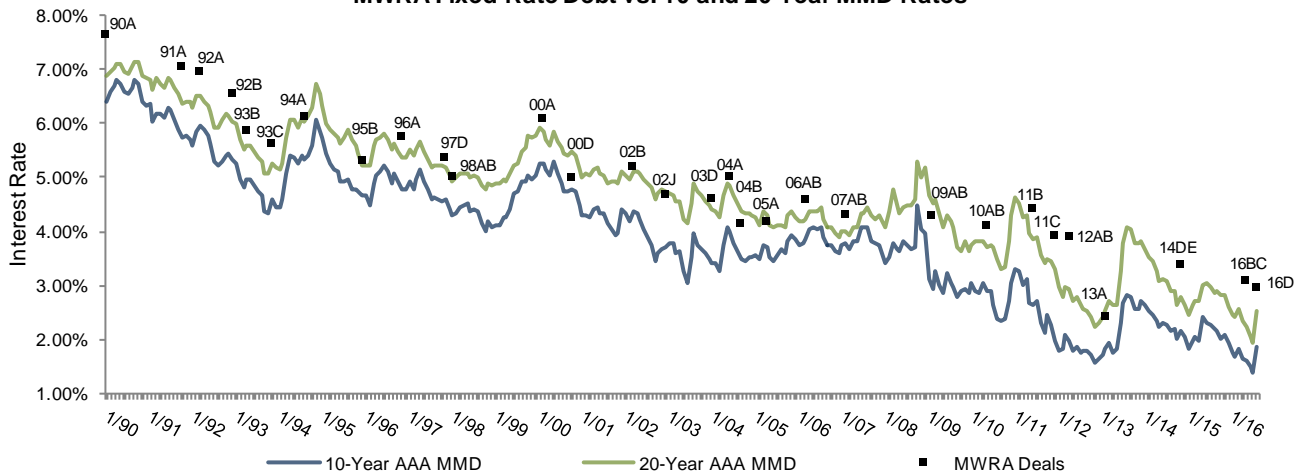
Average Cost of MWRA Debt FYTD

Fixed Debt (\$3,621)	3.95%
Variable Debt (\$481.2)	1.03%
SRF Debt (\$973.5)	1.38%
 Weighted Average Debt Cost (\$5,076)	 3.18%

Most Recent Senior Fixed Debt Issue August 2016

2016 Series D (\$104.3) 2.99%

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

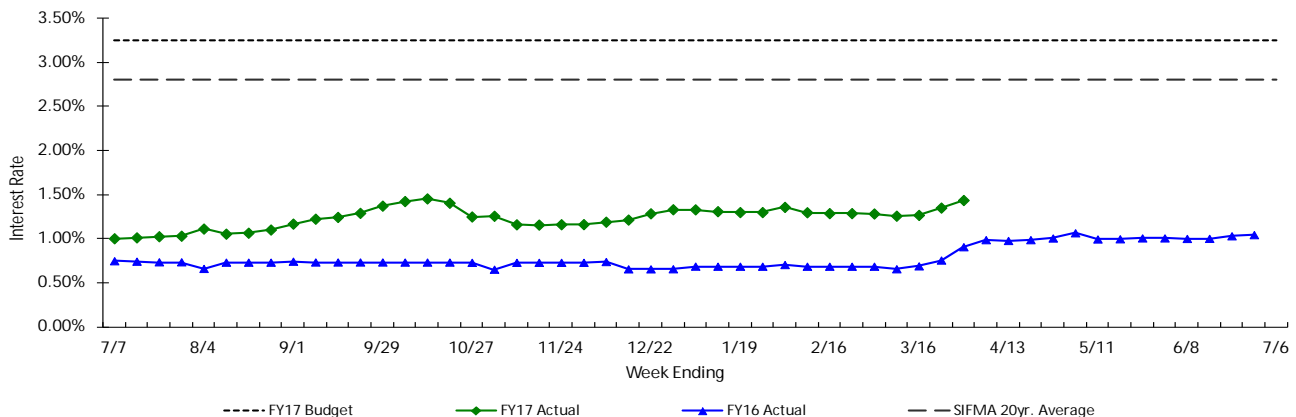


Bond Deal	1992A	1992B	1993B	1993C	1994A	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D
Rate	6.98%	6.58%	5.89%	5.66%	6.15%	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%
Avg Life	22.6 yrs	6.3 yrs	19.8 yrs	19.1 yrs	19.5 yrs	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs

Bond Deal	2004A	2004B	2005A	2006AB	2007AB	2009AB	2010AB	2011B	2011C	2012AB	2013A	2014DEF	2016BC	2016D
Rate	5.05%	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%
Avg Life	19.6 yrs	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	18.8 yrs

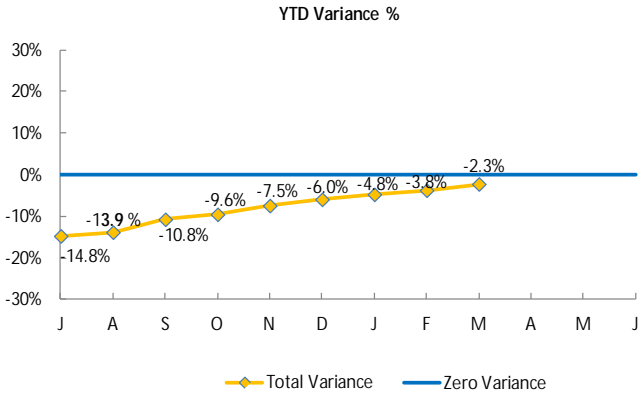
Weekly Average Variable Interest Rates vs. Budget

MWRA currently has eleven variable rate debt issues with \$903 million outstanding, excluding commercial paper. Of the eleven 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 0.79% to a low of 0.62% 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.



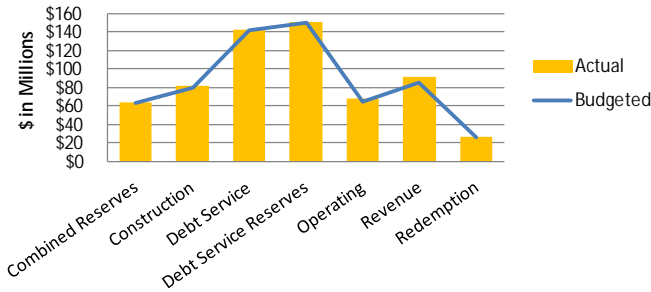
Investment Income 3rd Quarter – FY17

Year To Date

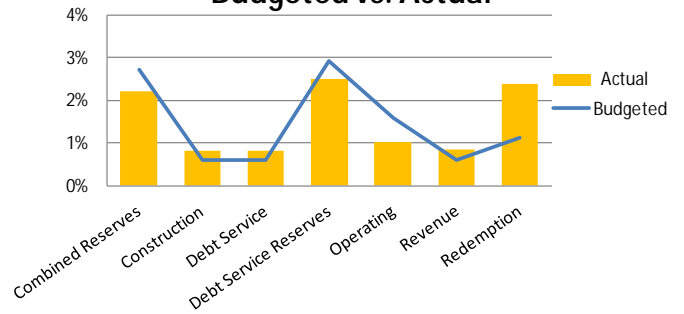


	YTD BUDGET VARIANCE			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	(\$0)	(\$238)	(238)	-18.8%
Construction	\$9	\$111	120	34.1%
Debt Service	\$7	\$242	249	39.9%
Debt Service Reserves	\$15	(\$467)	(452)	-14.0%
Operating	\$38	(\$317)	(279)	-37.0%
Revenue	\$26	\$174	200	52.8%
Redemption	(\$0)	\$245	245	112.0%
Total Variance	\$95	(\$250)	(\$155)	-2.3%

YTD Average Balances Budgeted vs. Actual

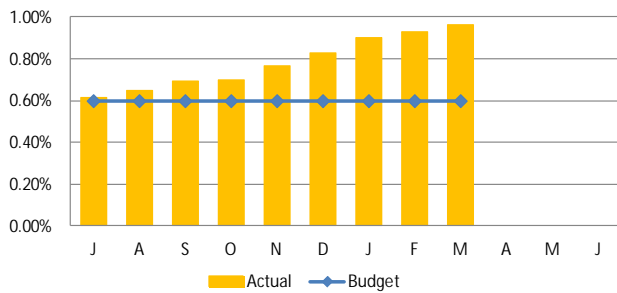


YTD Average Interest Rate Budgeted vs. Actual

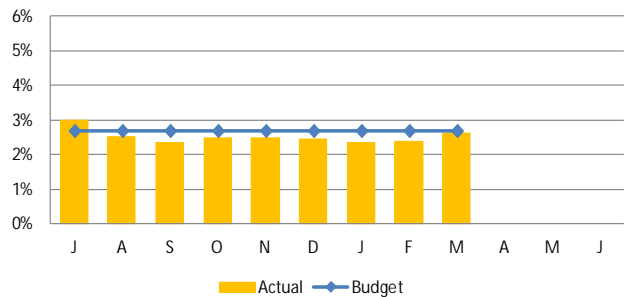


Monthly

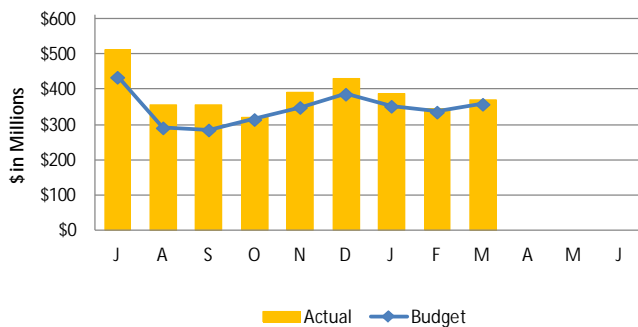
Short-Term Interest Rates



Long-Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances

