MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

On

Key Indicators of MWRA Performance

For

First Quarter FY17

Q1	Q2	Q3	Q4
■			

Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer
November 16, 2016

Board of Directors Report on Key Indicators of MWRA Performance

First 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.

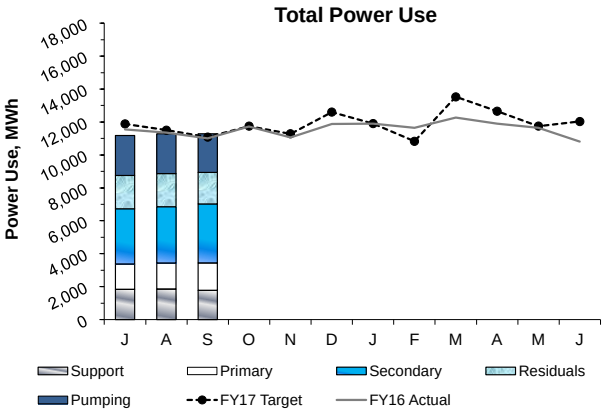
Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer

November 16, 2016

OPERATIONS AND MAINTENANCE

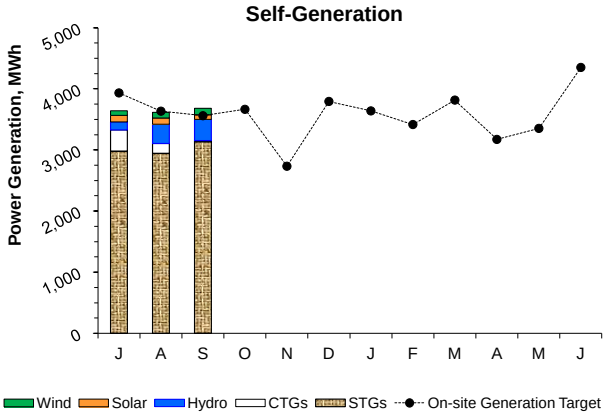
Deer Island Operations

1st Quarter - FY17



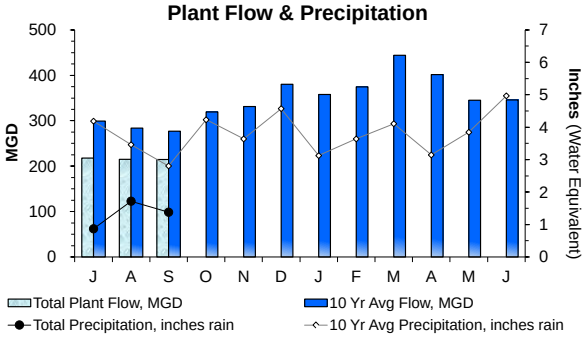
Total power usage in the 1st Quarter was 2.1% below target even though Total Plant Flow was 16.8% below target with the 3 year average plant flow. Power used in the Cryogenic Oxygen Facility was 13.4% higher than target as the operation of a second cold box unit was needed for the high dissolved oxygen demand in the secondary treatment process as a result of the extremely low plant flow. Operating a second cold box during the 1st Quarter has not been necessary in the last 3 years and contributed to the elevated expected power usage. Total Power usage for wastewater pumping operations was 12.3% below target due to the lower plant flow.

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

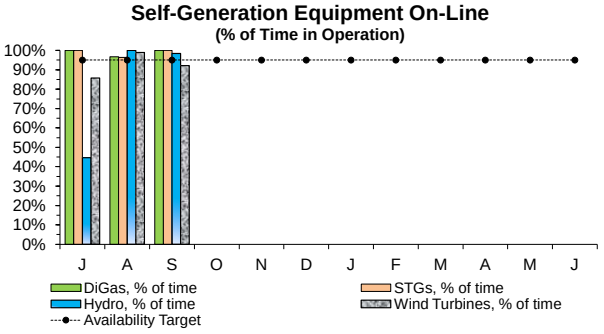


Power generated on-site during the 1st Quarter was 1.7% below target. While generation by the STGs, CTGs, Solar, and Wind Turbines met or exceeded their target, generation by the Hydro Turbines was below target due to mechanical issues. The CTGs generated 44.5% more power than expected during the quarter as the CTGs were operated for approximately 45 hours during the 1st Quarter for a demand response event in August, for peak shaving in July and August, and for routine maintenance/checkout purposes.

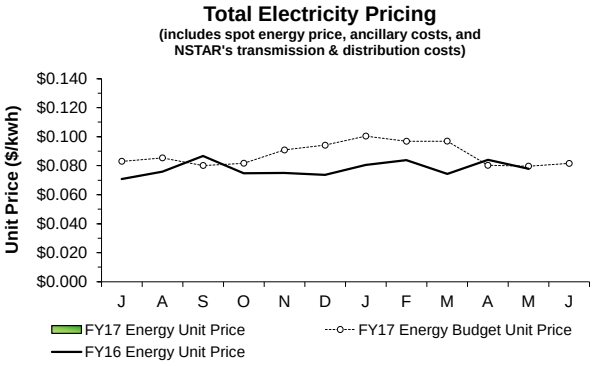
Note: Power generation data for the Solar Panels and the Wind Turbines may be difficult to see as the amount of power generated is low within the current scale of this graph; a total of 283.7 MWh was generated by the Solar Panels and 274.7 MWh was generated by the Wind Turbines in the 1st Quarter.



Total Plant Flow for the 1st Quarter was 24.7% below target with the 10 year average plant flow (215.8 MGD actual vs. 286.7 MGD expected) as precipitation for the quarter was 62% lower than target (3.97 inches actual vs. 10.45 inches expected).

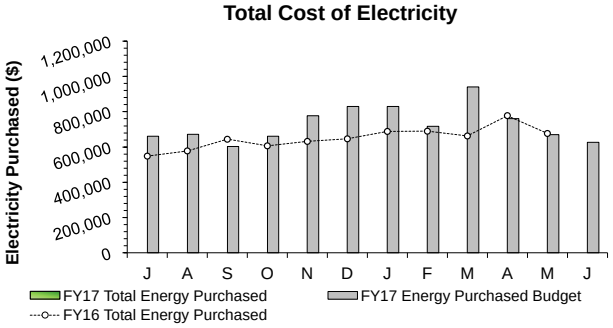


The DiGas system and STGs exceeded the 95% availability target for the 1st Quarter. The Wind Turbines fell below target due to mechanical issues with Turbine #2, which was offline from July 18 to July 27, and the Hydro Turbines were not available during the first half of July.



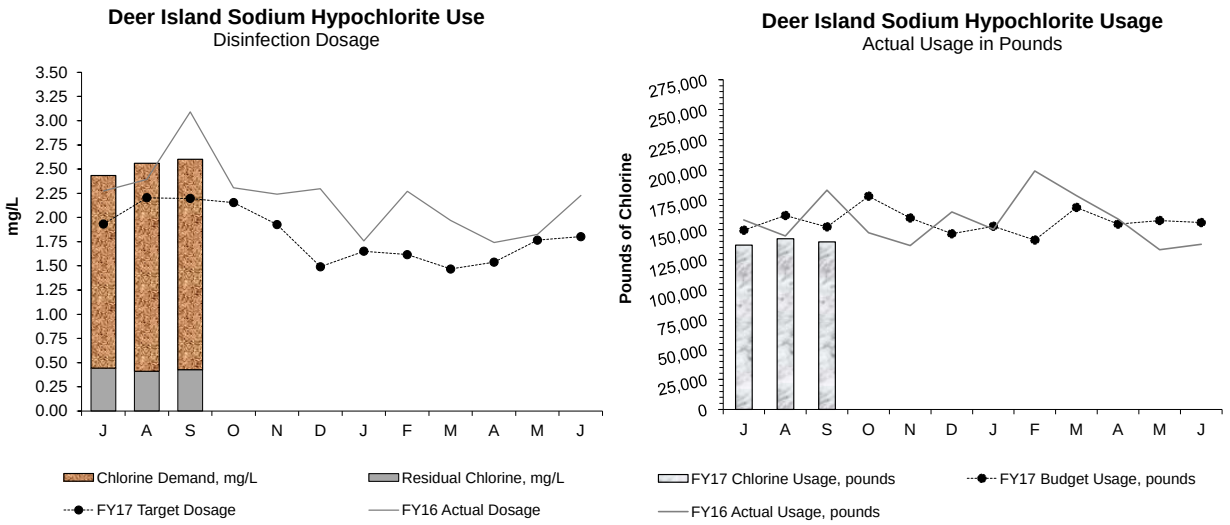
Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual total energy unit prices in July, August, and September are not yet available as the complete invoices for these months are still pending receipt and/or review as of reporting time.The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

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



The Electricity cost data for Electricity Purchased during the 1st Quarter are not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.

Note: Only months with complete Electricity Purchased data are reported. Therefore, the dataset lags by three (3) months due to the timing of invoice receipt.



The disinfection dosing rate in the 1st Quarter was 20% higher than the target. DITP maintained an average disinfection chlorine residual of 0.43 mg/L this quarter with an average dosing rate of 2.53 mg/L (as chlorine demand was 2.11 mg/L). Chlorine dosing was higher than expected due to lower than expected plant flow resulting in a higher chlorine demand. However, actual sodium hypochlorite usage in pounds of chlorine was 9.6% below target this quarter.

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					
N					
D					
J					
F					
M					
A					
M					
J					
Total	0	0	0	100.0%	0.00

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved a peak flow rate of 741.2 MGD in the early morning of August 22 during a rain event that produced 0.90 inches of precipitation. Overall, Total Plant Flow in the 1st Quarter was 24.7% below the 10 year average plant flow target for the quarter.

Several all-time low flow records (post DITP startup, July 1998) were set this quarter as a result of these low flows:

- Monthly Average Total Plant Flow - 214.64 MGD set in September 2016 (previous record was 215.04 MGD from August 2016),
- Monthly Average South System Flow - 62.28 MGD set in September 2016 (previous record was 62.96 MGD from August 2016),
- Monthly 365-Dry Day Flow - 253.9 MGD set in September 2016 (previous record was 254.9 MGD from August 2016).

On September 4, 2016, three (3) daily low flow records were also set:

- The Daily Average Total Plant Flow of 188.82 MGD broke the record of 197.0 MGD that was set on October 20, 2015,
- The Daily Average North System Flow (not impacted by a North Main Pump Station shutdown for valve replacement project) of132.52 MGD broke the all time daily low flow record of 135.53 MGD that was set on July 3, 2016,
- The Daily Average South System Flow of 56.26 MGD broke the all time daily low flow record of 58.57 MGD that was set on August 20, 2016 .

Additionally, monthly average low flow records for Total Plant Flow, North System Flow, and South System Flow were all set in July, August, and September.

Deer Island Operations & Maintenance Report (continued)

Environmental/Pumping (continued):
The effects of the regional drought conditions causing these low flow records to be broken, can also be seen in the FY07 through FY16 secondary blending table below. The average daily plant flow, as well as the number and duration of blending events, has decreased substantially.

DITP Secondary Blending Data FY07 - FY16

Fiscal Year	Total Blending Events	Percent Secondary Treatment
FY07	30	98.71%
FY08	27	99.00%
FY09	30	99.02%
FY10	40	95.85%
FY11	26	99.21%
FY12	36	99.18%
FY13	28	98.87%
FY14	15	99.49%
FY15	23	99.00%
FY16	10	99.75%

Primary and Secondary Treatment:
Progress on the major Primary and Secondary Scum Tip Tube Replacement Project continues. The primary scope of this project is to replace 88 of the 96 primary treatment tip tubes, 72 treatment tip tubes in Secondary Batteries A and B, and modification of 36 secondary tip tubes in Secondary Battery C. Construction related to the physical replacement of the tip tubes was completed well ahead of schedule. Performance testing, adjustments related to project punchlist items, and troubleshooting of sporadic tip tube operational issues are currently in progress.

Odor Control:
Activated carbon in carbon adsorber (CAD) units #1, #2, #3, #5, #6, #7, and #8 in the East Odor Control (EOC) Facility, CAD units #2 and #4 in the West Odor Control (WOC) Facility, and CAD units #2 and #4 in the North Pumping Odor Control Facility (NPOC) was changed out in September as part of routine practice to replace spent carbon.

Energy and Thermal Power Plant:
Overall, total power generated on-site accounted for 32.4% of Deer Island's total power use for the quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 30.8% of Deer Island's total electrical power use for the quarter.

Eversource performed essential maintenance on the B-side transformer located in Station 132 (Eversource-owned building on DITP) from July 7 through August 10. DITP continued to receive power from Eversource during this work. Normally, both the A-side and B-side Eversource transformers are energized. However, during this work, the Eversource B-side transformer was taken out of service for maintenance. Both CTGs were available for demand response or peak demand avoidance events, in addition to providing backup power in the event of a power failure. Starting at the Main Switchgear Building (MSB), power was still distributed to both the A and B buses around to the 43 substations on DITP during this Eversource B-side transformer maintenance outage. No operational issues occurred as a result of this maintenance activity.

The CTGs were operated for 40 hours in the 1st Quarter during high electricity demand periods for a demand response event and to help to avoid peak pricing, as well as potentially avoid the peak hourly demand which could reduce DITP's electricity capacity charges for next year. In addition, the CTGs operated for 4.4 hours on five (5) different days for routine maintenance/checkout purposes.

Regulatory:
Emissions compliance testing on the Secondary Odor Control (SOC) treatment system on DITP was conducted by consultants from July 6 to July 7. The SOC treatment system treats combined process air from the secondary clarifiers and the reactors. The DITP Air Quality Operating Permit issued by the MA DEP requires that DITP conduct emissions compliance testing for the various emission units once every five (5) years to demonstrate compliance with applicable total reduced sulfur (TRS) and non-methane hydrocarbon (NMHC) emission limits. This testing requires the continuous emissions monitoring of the inlet and outlet of the odor control system over a 24-hour period for TRS at the outlet (stack) of the odor control system and for NMHC at the inlet. All emissions test results show that DITP was in compliance. The final report summarizing the test results was submitted to the MA DEP on September 6 by the consultants.

Representatives from the MA DEP were on site at the DITP on September 23 for an unannounced (annual) site visit of the treatment plant to review and inspect the plant's wastewater treatment operations and practices. The MA DEP representatives were given a comprehensive plant tour covering the entire wastewater and residuals treatment facilities and process areas. Initial communications indicate the inspection had gone well and no issues were raised by the DEP representatives.

Clinton AWWTP:

Phosphorus Reduction Facility: Completed forming and installing rebar for rapid mix tanks and wet well slab.
Electrical and plumbing contractors working on underground piping and conduit.
NGRID has commenced installation of natural gas service to treatment plant.

Primary Clarifiers: New alarms installed on torque overloads for drive units and wired to scada.

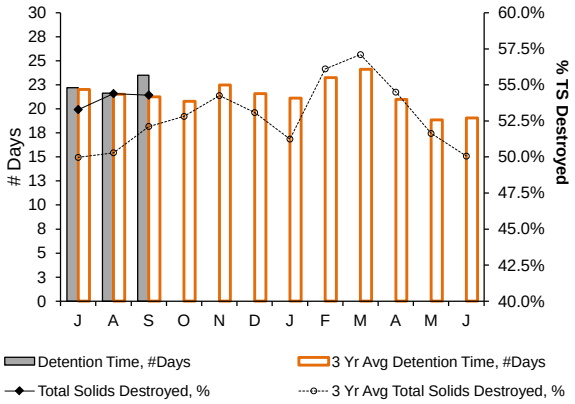
Digester Building: Installed two modulating gas valves for waste gas burners.

Trickling Filter #3: Machined and installed new sleeve on center column pedestal.

Deer Island Operations and Residuals

1st Quarter - FY17

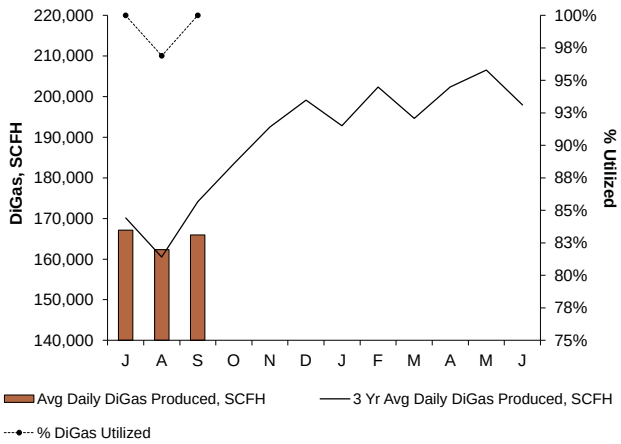
Sludge Detention Time in Digesters and Total Solids Destruction



Total solids (TS) destruction following anaerobic sludge digestion averaged 54.0% during the 1st Quarter, higher than the 3 year average of 50.8% for the same period, as the sludge detention time in the digesters was 22.4 days, higher than the 3 year average of 21.6 days as DI operated with an average of 7.8 digesters during the 1st Quarter in comparison to the 3 year average of 7.4 digesters.

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

Digester Gas Production and % Utilized

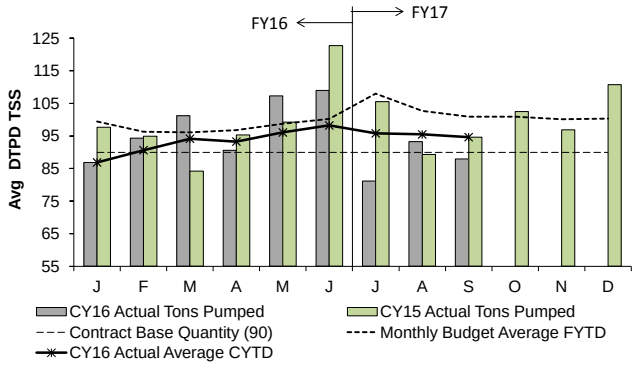


The Avg Daily DiGas Production in the 1st Quarter was 1.9% below target with the 3 Year Avg Daily DiGas Production for the same period due to lower than sludge production as a result of the lower than expected plant flows. On average, 98.1% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant.

Residuals Pellet Plant

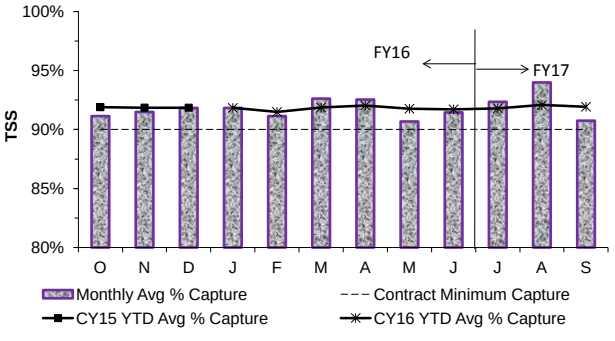
MWRA pays a fixed monthly amount for the calendar year to process up to 90 DTPD/TSS as an annual average. The monthly invoice is based on 90 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional payments are made on any quantity above the base amount. The base quantity of 90 DTPD/TSS was set for the 15-year term of the contract, even though, on average, MWRA processes more than 90 DTPD/TSS each year (FY16's budget was 100.2 DTPD/TSS and FY17's budget is 100.6 DTPD/TSS).

Sludge Pumped From Deer Island



The average total quantity of sludge pumped to the Pellet Plant in the 1st Quarter of FY17 was 87.4 DTPD - lower than FY17's average budget of 100.6 DTPD. The lower amount of sludge pumped from Deer Island in the 1st Quarter, in comparison to the FY17 budget average, was due to lower than average sludge production, a result of the much lower than average plant flows.

Monthly Average % Capture of Processed Sludge



The contract requires NEFCo to capture at least 90% of the solids delivered to the Biosolids Processing Facility in Quincy. The CY16 YTD average capture is 91.93%.

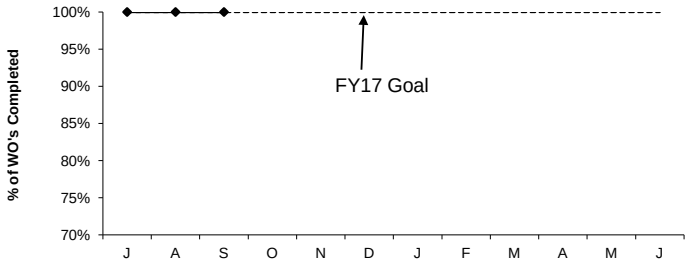
Deer Island Maintenance

1st Quarter - FY17

Productivity Initiatives

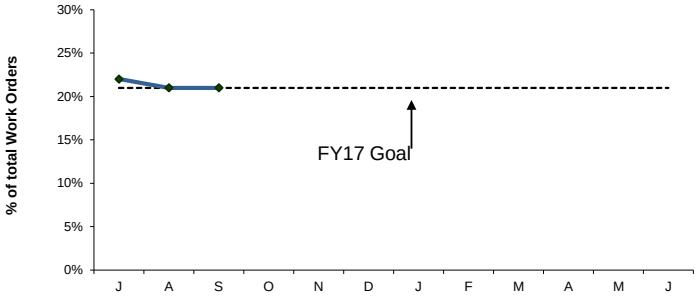
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.

Predictive Maintenance Compliance



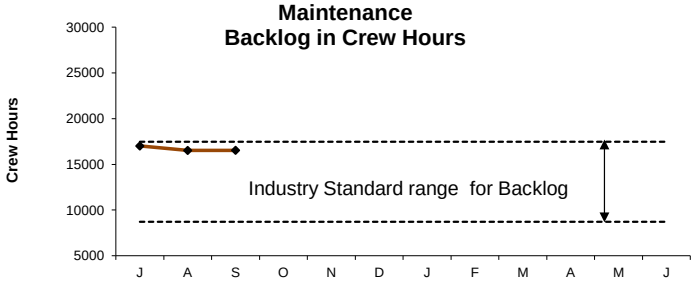
Deer Island's FY17 predictive maintenance goal is 100%. DITP completed 100% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program.

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

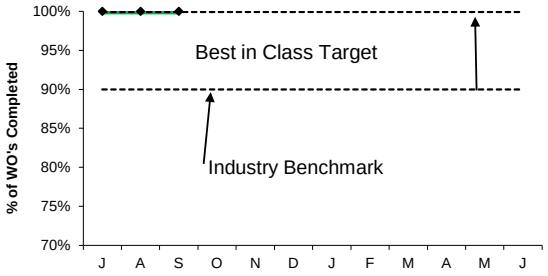


DITP's maintenance backlog at Deer Island is 16,683 hours this quarter. DITP is within the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by four vacancies; M&O Specialist, Instrument Technician, Electrician and a HVAC Specialist. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

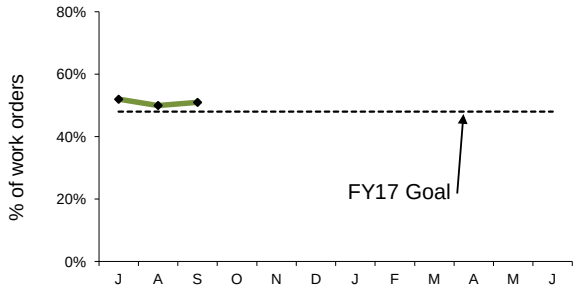
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting.
These tasks should result in lower maintenance costs.

Preventive Maintenance Compliance



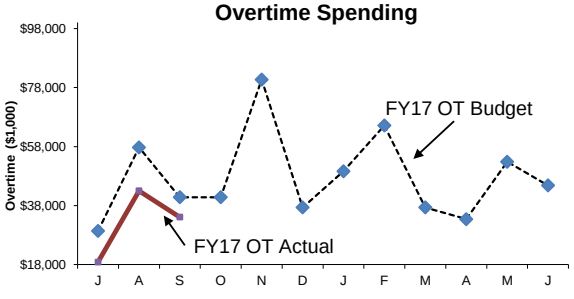
Deer Island's FY17 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 100% of all PM work orders this quarter.

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



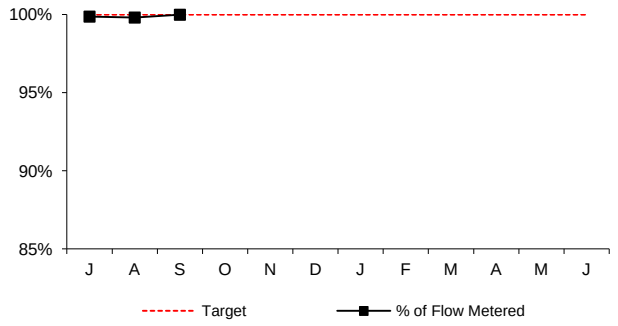
Maintenance overtime was under budget by $41K this quarter and $41k under for the year. Management continues to monitor backlog and to ensure all critical equipment and systems are available. This quarters overtime was predominately used for Island Wide HVAC work, Winthrop Terminal Facility Wash Press Rebuilds, Clinton Treatment Plant Trickling Filter Project, Stop Log Project, and Wet Taps to the Residuals Digested Sludge Lines.

Operations Division Metering

1st Quarter - FY17

WATER METERS

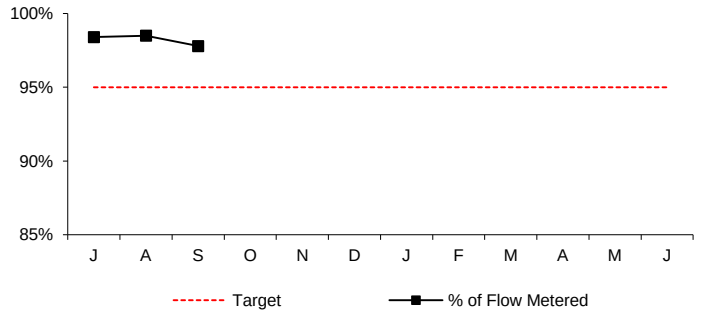
Percent of Total Revenue Water Deliveries Calculated Using Meters



The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During the 1st Q of FY17, meter actuals accounted for 99.89% of flow; only 0.11% of total revenue water deliveries were estimated. The following is the breakdown of reasons for estimations:
In-house and Capital Construction Projects - 0.08%
Instrumentation Failure - 0.03%

WASTEWATER METERS

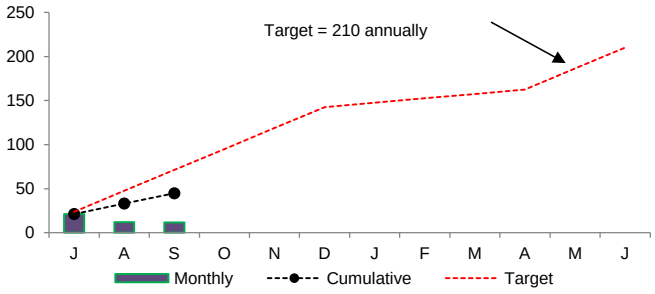
Percent of Total Wastewater Transport Calculated Using Meters



The target for revenue wastewater transport calculated using meters is 95%. Estimates are generated for meters missing data due to instrument failure and/or erratic meter behavior. Estimates are produced using data from previous time periods under similar flow conditions. During the 1st Q of FY17, meter actuals accounted for 98.2% of flow; only 1.8% of wastewater transport was estimated.

WATER DISTRIBUTION SYSTEM PIPELINES

Miles Surveyed for Leaks



During the 1st Quarter of FY17, 44.73 miles of water mains were inspected. Miles surveyed, below target due to training of new staff.

Leak Backlog Summary

Month	J	A	S	O	N	D	J	F	M	A	M	J
Leaks Detected	3	2	2									
Leaks Repaired	1	1	1									
Backlog	7	8	9									
Avg. Lag Time	24.9	42.3	36.7									

During the 1st Quarter of FY17, seven new leaks were detected and two were repaired. Additionally during the 1st Quarter , #44 Arborway @ St. Joseph, West Roxbury originally detected on January 11, 2015 was repaired on August 15, 2016. Refer to FY17 Leak Report below for details. Also during the 1st Quarter of FY17 community service ranging from individual leak location to hydrant surveys were conducted for: Arlington, Boston, Chelsea, DCR Amelia Earhart Dam, Medford, Marlboro Newton, Somerville. Swampscott, and Waltham.

FY17 Leak Report - 1st Quarter

Date Detected	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

Date Detected	Location of Leaks/Unrepaired
6/8/2015	Allandale Rd. @ Grove St., Brookline, Sched for late Fall (demand drops)
6/17/2015	Single Main for the South, can't shut down - To be determined.
7/16/2015	#56 Capt Robert Cook Dr, Needham - Sched for late Winter early Spring .
6/1/2016	Comm Ave at Oakland, Newton, to be done in October
7/1/2016	241 Forest St., Winchester - Late Winter 2017 - difficult Main to close.
7/26/2016	Res Playground Cleveland Cir., - Dec/Jan/Feb Pipe is in Ball Pk, wait until frozen.
8/11/2016	Lee Street @ Boylston St., (Rte 9) Brookline - work scheduled for October
8/30/2016	Morton Street @ American Legion, W. Roxbury - repair scheduled for Nov
9/28/2016	Quinobequin Road @ Rt 128, Newton - scheduled for Oct

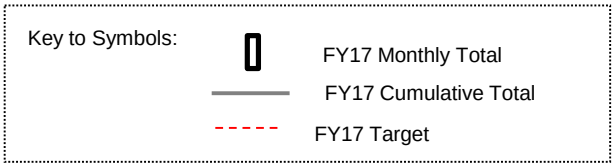
Water Distribution System Valves

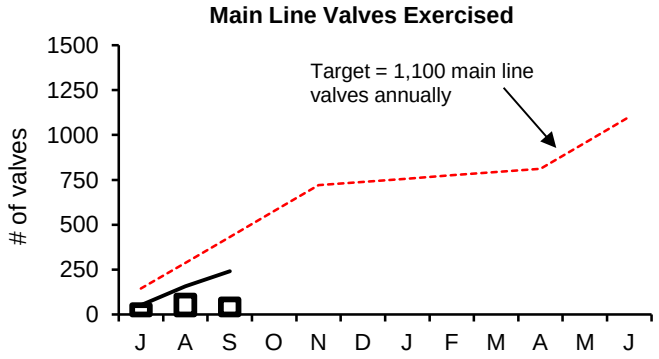
1st Quarter - FY17

Background

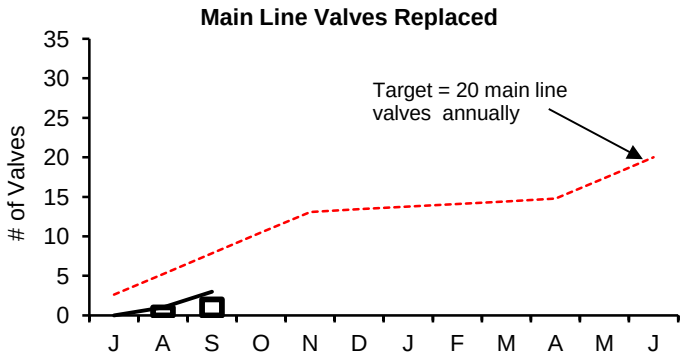
Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but 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	96.0%	95%
Air Release Valves	1,380	94.3%	95%
Control Valves	49	100.0%	95%

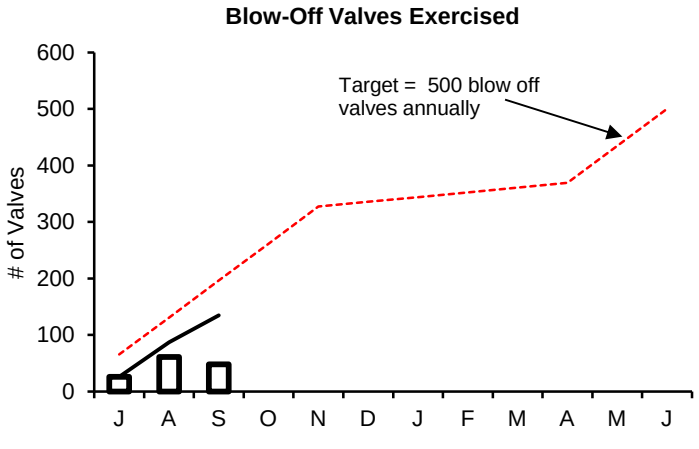




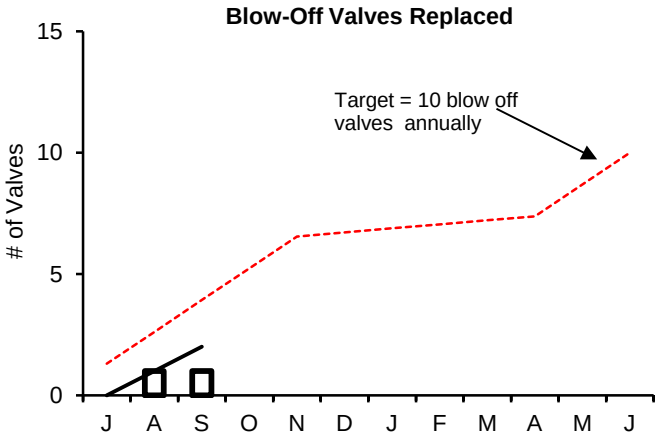
During the 1st Q of FY17, staff exercised 242 main lines valves. Below target due to staffing shortage and high priority CIP projects.



During the 1st Quarter of FY17, staff replaced three main line valves.



During the 1st Quarter of FY17, staff exercised 135 blow off valves. .



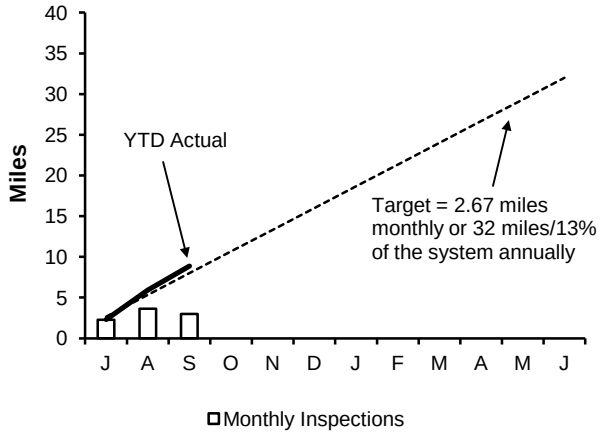
During the 1st Quarter of FY17, staff replaced two blow off valves.

Wastewater Pipeline and Structure Inspections and Maintenance

1st Quarter - FY 17

Inspections

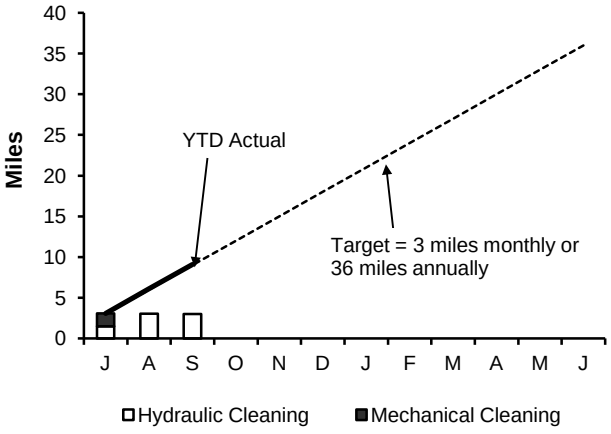
Pipeline Inspections



Staff internally inspected 8.88 miles of MWRA sewer pipeline during this quarter. The year to date total is 8.88 miles. No Community Assistance was provided this quarter.

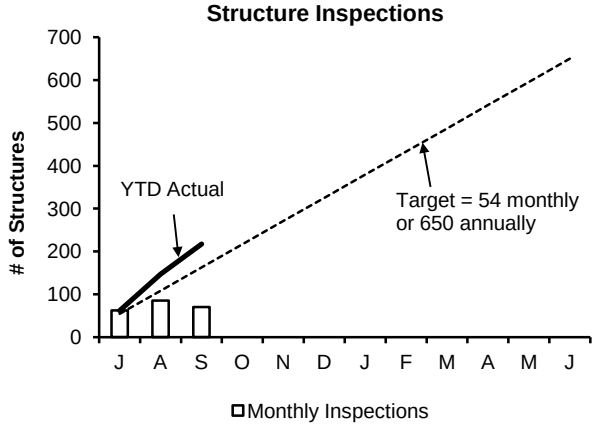
Maintenance

Pipeline Cleaning



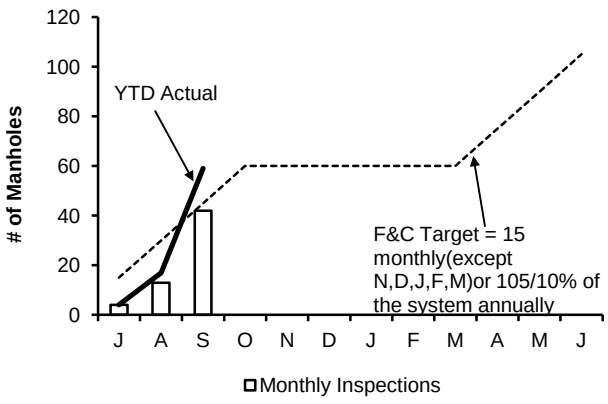
Staff cleaned 9.09 miles of MWRA's sewer system and removed 48 yards of grit and debris during this quarter. The year to date total is 9.09 miles. No Community Assistance was provided this quarter.

Structure Inspections



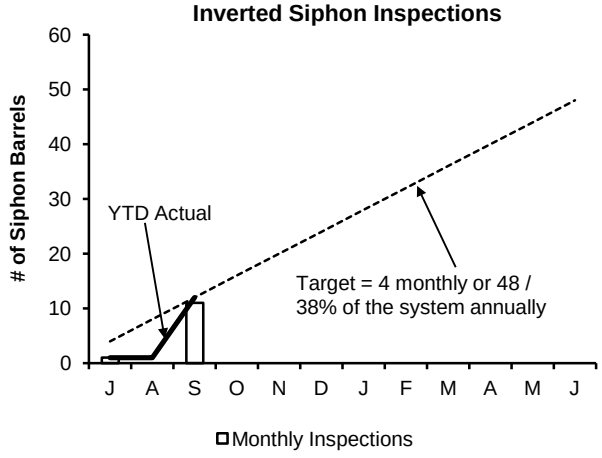
Staff inspected the 36 CSO structures and performed 181 additional manhole/structure inspections during this quarter. The year to date total is 217 inspections.

Manhole Rehabilitation



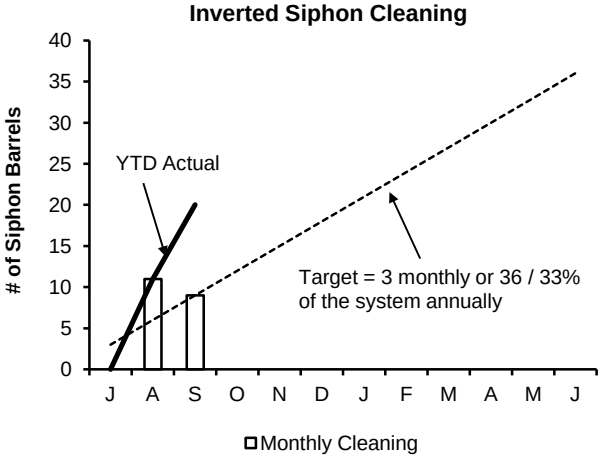
Staff replaced 59 frames & covers during the quarter. The year to date total is 59.

Inverted Siphon Inspections



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

Inverted Siphon Cleaning

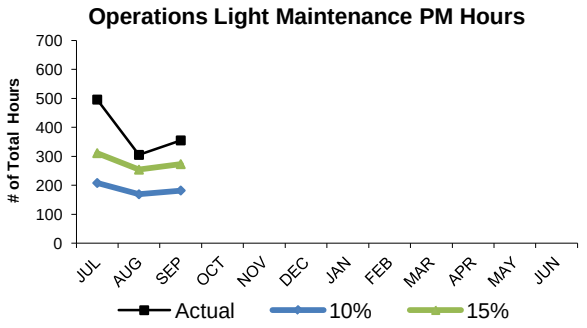


Staff cleaned 11 siphon barrels during the month of September. Year to date total is 20.

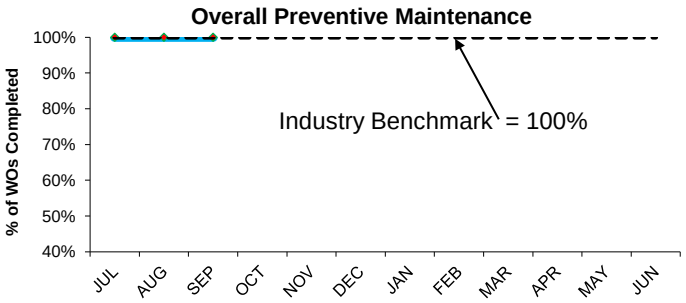
Field Operations' Metropolitan Equipment & Facility Maintenance

1st Quarter - FY17

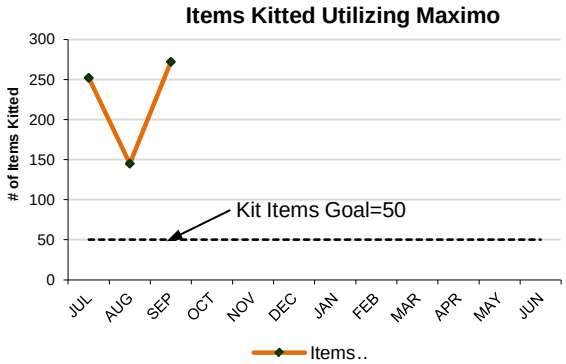
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



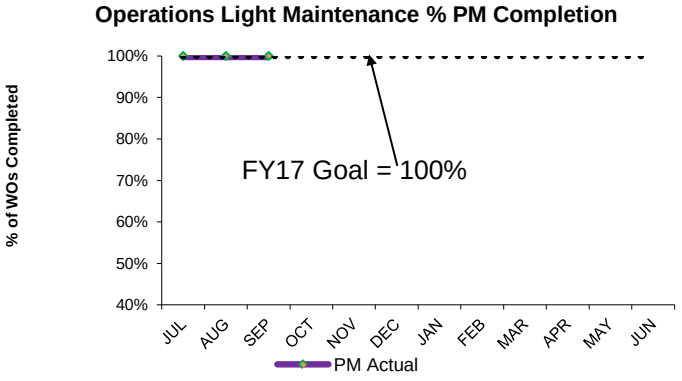
Operations staff averaged 385 hours of preventive maintenance during the 1st Quarter, an average of 19% of the total PM hours for the 1st Quarter, which is above the industry benchmark of 10% to 15%.



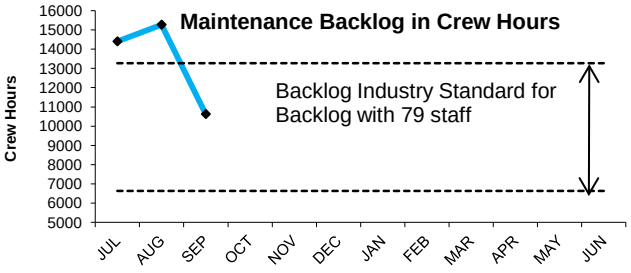
The Field Operations Department (FOD) preventive maintenance goal for FY17 is 100% of all PM work orders. Staff completed an average of 100% of all PM work orders in the 1st Quarter.



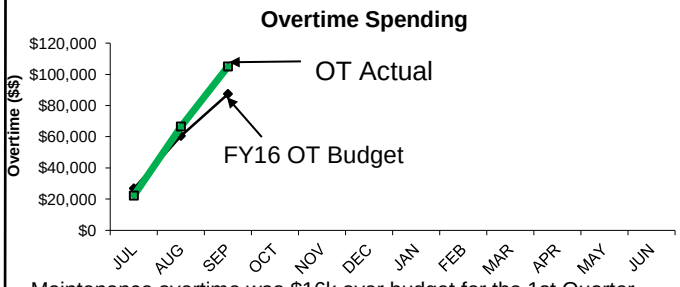
In an effort to more efficiently complete work, maintenance staff and work coordination staff have utilized the Lawson/Maximo interface to better kit stock and non stock material. The goal for FY17 is to "kit" 50 stock and non stock items total per month. An average of 223 items were kitted during the 1st 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 1st Quarter.



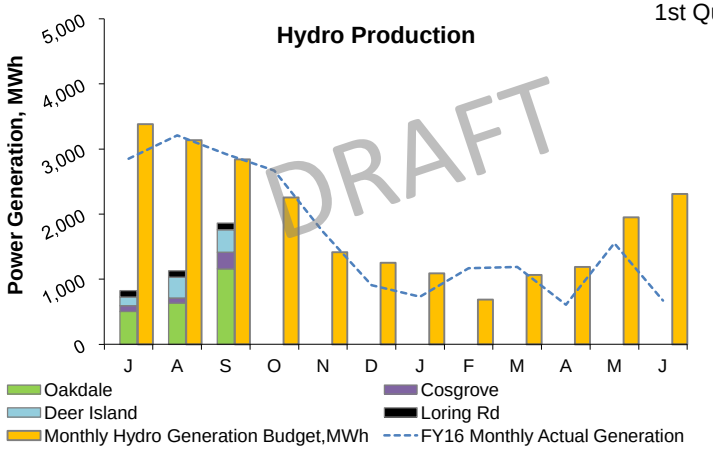
The 1st Quarter backlog average is 13435 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6450 to 12,940 hours.



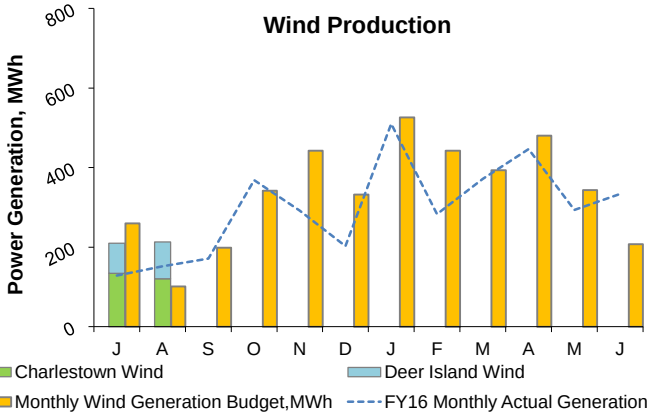
Maintenance overtime was $16k over budget for the 1st Quarter. Overtime was used for critical maintenance repairs, such as painting at Nut Island (after the fire), replacing the odor control fan at the Braintree Weymouth Pump Station, acid washing odor control scubbers at Columbus Park, as well as facilities support of Water Pipeline Maintenance.

Renewable Electricity Generation: Savings and Revenue

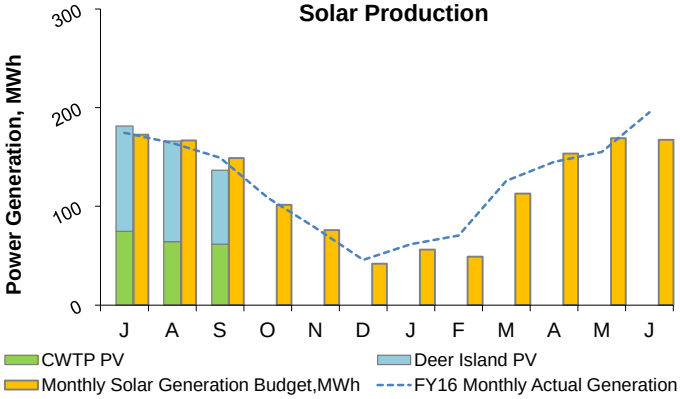
1st Quarter - FY17



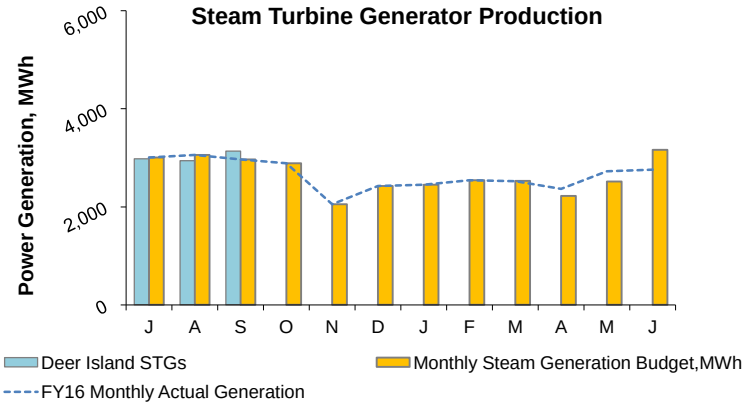
In the 1st quarter, the renewable energy produced from all hydroelectric facilities totaled 3,815 MWh; 59% below budget[3]. The reasons are threefold**: (1) Oakdale generation values were highly underestimated by the utility, and utility data corrections will be reconciled in later months**; (2) Cosgrove was operating at a lower rate for scheduled testing; (3) both Deer Island hydro turbines were off-line due to mechanical issues. DI Hydro 2 was repaired and returned to service on 7/18/2016. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.



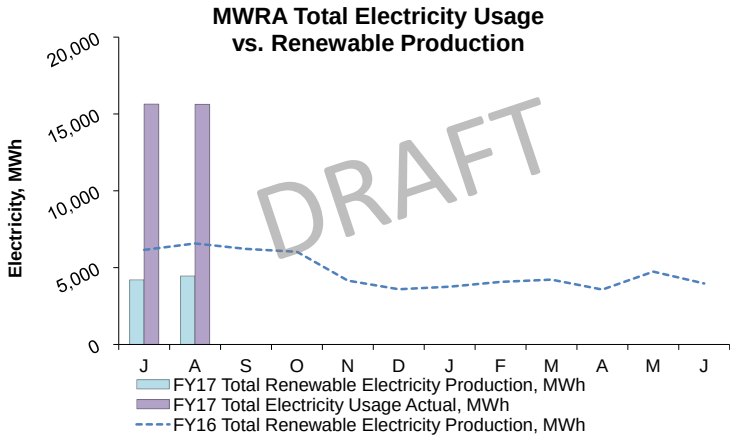
In the first 2 months if Q1, the renewable energy produced from all wind turbines totaled 423 MWh; 17% above budget[3]. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.

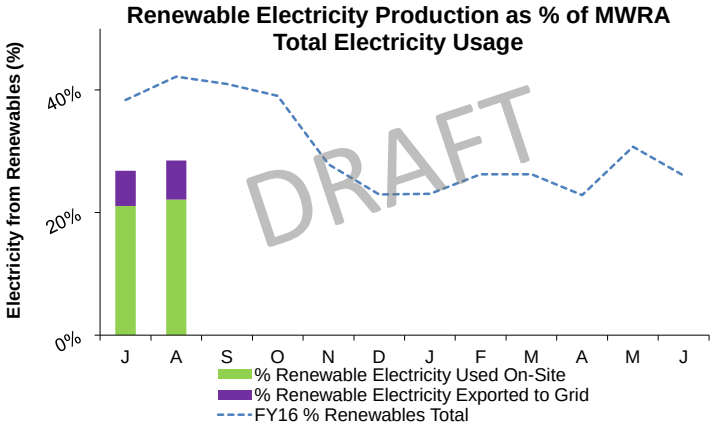


In the 1st quarter, the renewable energy produced from all solar PV systems totaled 484 MWh; 1% below budget[3]. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.



In the 1st quarter, the renewable energy produced from all steam turbine generators totaled 9,057 MWh; equal to budget[3]. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.





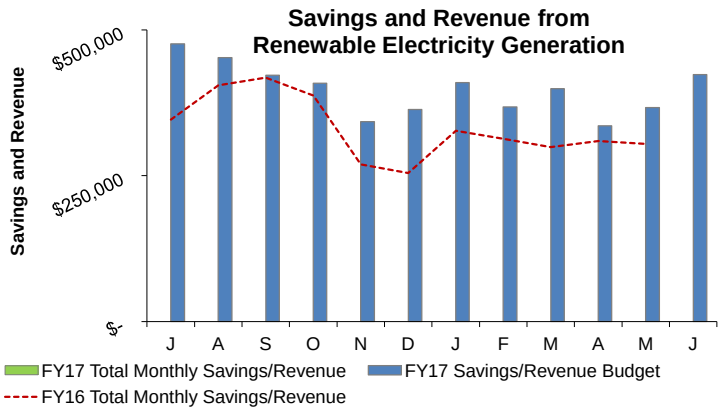
In the first 2 months of FY17, MWRA's electricity generation by renewable resources totaled 8,647 MWh. Oakdale hydro generation data was underestimated by the utility and will be reconciled in later months; this will be reflected in future reporting. MWRA's total electricity usage was approximately 31,277 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.

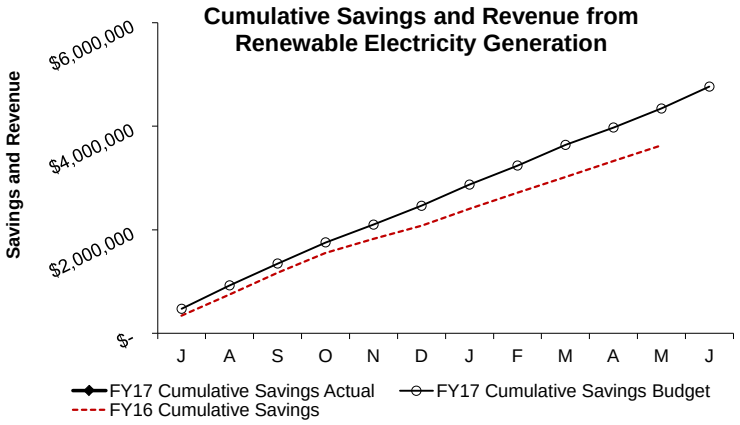
In the first 2 months of FY17, green power generation represented approximately 28% of total electricity usage. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the 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

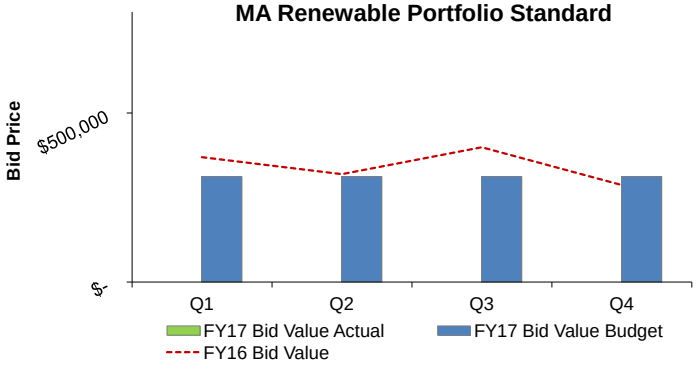
1st Quarter - FY17

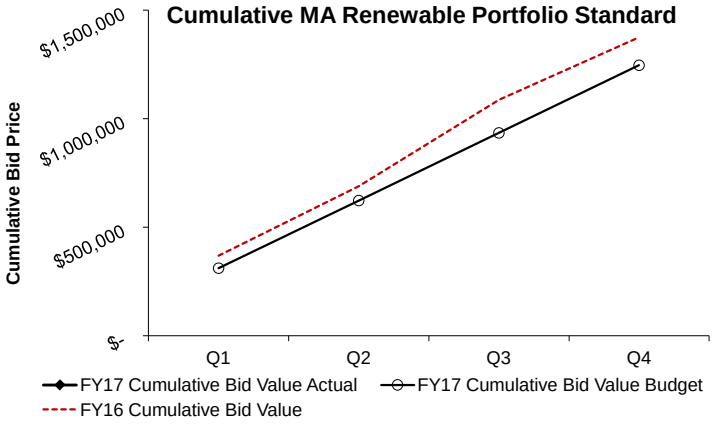




Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time[1].

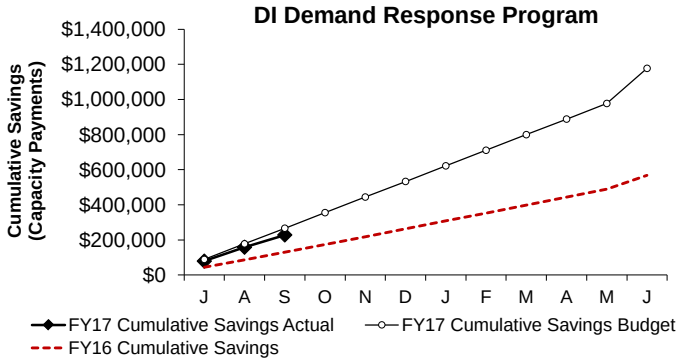
Savings and revenue[2] from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).
The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).

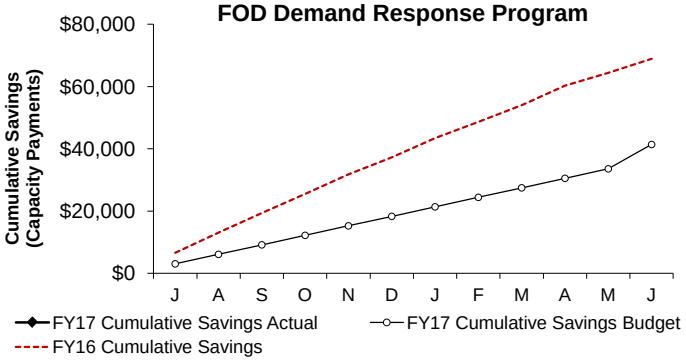




REC Bids have not yet been received for FY17[1].

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



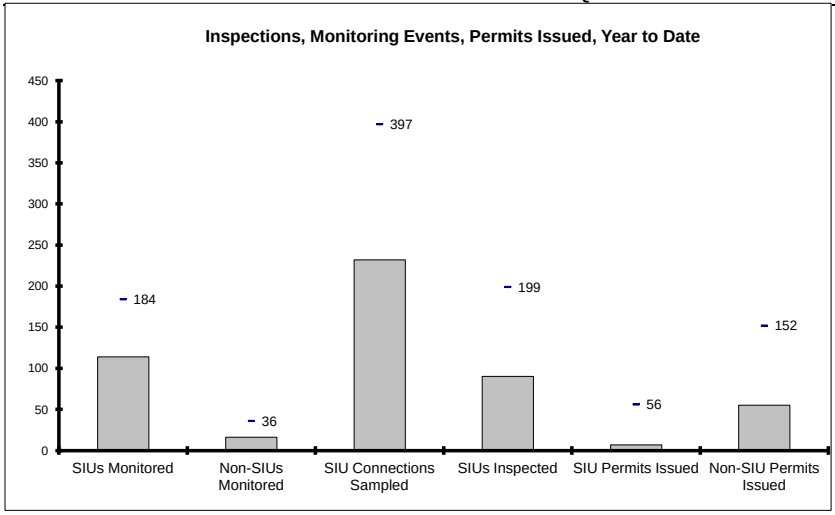


Currently Deer Island, JCWTP, and Loring Rd participate in the ISO-New England Demand Response Programs[4]. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY17 Cumulative savings (Capacity Payments only) through September[1] total $228,296 for Deer Island. Payments for FOD have not yet been recieved in FY17.

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

1st Quarter - FY17



EPA Required SIU Monitoring Events
for FY17: 184
YTD : **114**

Required Non-SIU Monitoring Events
for FY17: 36
YTD : **16**

SIU Connections to be Sampled
For FY17: 397
YTD: **232**

EPA Required SIU Inspections
for FY17: 199
YTD: **90**

SIU Permits due to Expire
In FY17: 56
YTD: **7**

Non-SIU Permits due to Expire
for FY17: 152
YTD: **55**

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.

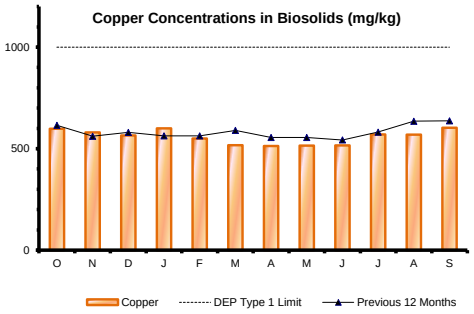
The "SIU Monitored" data above, reflects the number of industries monitored in the month. However, many of these industries have more than one sampling point and the "SIU Connections Sampled" data reflect samples taken from multiple sampling locations at these industries.

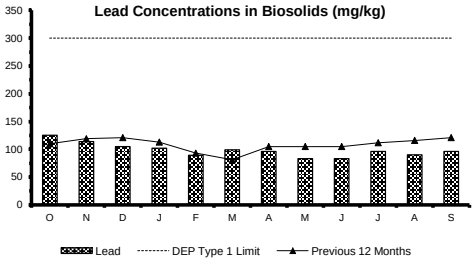
TRAC's annual monitoring and inspection goals are set at the beginning of each fiscal year but they can fluctuate due to the actual number of SIUs at any given time. During the course of the year, some SIUs do not discharge and cannot be monitored. TRAC also monitors one-third of the non-SIUs each year.

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								
	0 to 120		121 to 180		181 or more		Total Permits Issued	
	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU
Jul	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								
Nov								
Dec								
Jan								
Feb								
Mar								
Apr								
May								
Jun								
% YTD	86%	95%	0%	4%	14%	2%	7	55

EPA requires MWRA to issue or renew 90% of SIU permits within 120 days of receipt of the application or the permit expiration date - whichever is later. EPA also requires the remaining 10% of SIU permits to be issued within 180 days. In the 1st Quarter of FY17, fifty-five permits were issued, seven of which were SIUs. All permits except for one SIU and three non-SIUs were issued in the 120-day timeframe. Two non-SIU permits were issued in the 120-day to 180-day timeframe. One SIU permit and one non-SIU permit were issued beyond the180-day period. The SIU permit was issued late because of the late payment on the FY16 invoice issued to the permittee last December. Other delays were due to new facilities requiring municipality approval and the cocommitant start-up problems.

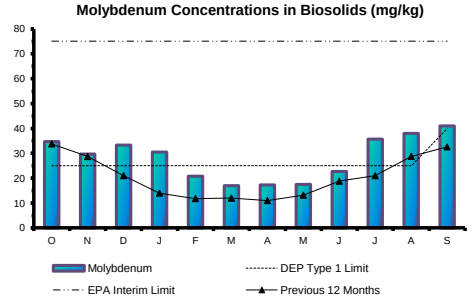




Copper, lead, and molybdenum are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. Cooling tower usage typically causes a seasonal spike in molybdenum concentrations due to the blowdown on large AC systems that use corrosion inhibitors containing molybdenum. Levels drop again following the end of the cooling season, although this is delayed due to biosolids processing time.

During this 1st quarter of FY17, the MassDEP regulations for molybdenum officially changed from 25 mg/kg, matching the New York limits at 40 mg/kg for land use application. The MWRA will now likely be able to consistently sell its pellets in-state throughout the year. The previous limits forced several months' worth of pellets to be shipped out of state, and made it an impractical source of fertilizer for local Massachusetts farms.

In September, the level of molybdenum was 41 mg/kg, slightly exceedeing the new higher DEP limits. MWRA and its contractor, NEFCO, do not distribute product that does not meet the suitability standards.



Field Operations Highlights – Orange Notebook Bullets

1st Quarter – FY17

Western Water Operations and Maintenance

- Carroll Water Treatment: Operations and Maintenance Staff removed and replaced the fluoride chemical feed lines from the Chemical Building to the Post Treatment Building. Operations Staff, along with a contractor, repaired the lining of Sodium Hypo Chlorite Tank #7. This required the tank to be drained, flushed and ventilated.
- Reservoir Operations-Aquatic Invasive Plants Control Operations: Diver Assisted Suction Harvesting (DASH) Operations of Eurasian Watermilfoil Phase II Operations are well underway at Wachusett Reservoir's Stillwater Basin. The contractor's diver completed harvest of areas in lower Wachusett Basin System and final QA Diver Inspection to follow. Pre-harvest Survey of Aquatic Plants was completed at Chestnut Hill Reservoir.
- Cosgrove Intake Facility: Operations and Maintenance worked closely with a representative from the Hydro Power Generation Turbine Manufacturing Company to replace a bushing in the turbine blade angle control mechanism. This required the turbine to be offline for a week while the crew disassembled the upper section of the rotating assembly and replaced the bushing.
- Foss Reservoir: Facility Maintenance Staff constructed a dam seepage-monitoring weir downstream of the Foss Dam near the outlet structure, modifying the consultant's design based on field observations and engineer's recommendations.

Operations Engineering

Shaft 5 Leak Repair: Participated in cleanliness walk and developed and implemented the chlorination and activation plans of the aqueduct.

GPS Collection Project: The interns have finished the GPS Collection Program and they have collected GPS coordinates on 4,939 valves and GPS coordinates for 7,679 manholes. This is 96% of the MWRA Valves. 100% of the valves were not collected due to valves not being found in the field. The valves were either abandoned or paved over. The Pipeline and Valve Groups will be working with Operations Engineering to complete the remaining 4%.

Norumbega Tank Inspection Contract: Contractor is scheduled work to begin on November 21st. Currently assembling the Inspection Plan which includes operation plans, prerequisites and constraints.

Shaft 8 Siphon Repair: Assembled plans for the repair of 6" and 10" siphon pipes at the Shaft 8 Intake Facility, used seasonally to divert water from the Ware River into the Quabbin Aqueduct.

Larz Anderson Bridge in Cambridge: The Contractor, Barletta, continues to try to pass the pressure test on the newly installed 30-inch west main, Section 10, located on the Larz Anderson Bridge. The contractor procured a leak detection contractor to help determine where the leak was located on the new 30-inch main. Due to the small amount of leakage and the size of the pipe, the leak contractor was unable to determine where the leak or leaks were.

- Community Support

Lexington: Working with the Town of Lexington developing a system hydraulic gradeline. The Towns of Lexington and Bedford have areas that have experienced very low pressures. This is due to the drought and increased summer demands. The development of the gradeline may help determine what may be done within their system to help increase the pressures. In September, when the water demand dropped off, both Lexington's and Bedford's pressures increased.

Winchester: Also, due to the drought and increased summer demand, the Town of Winchester experienced areas with low pressures. Testing at Meter 130 located on Forest Street determined that the meter will need to increase in size; Engineering will design the changes and the Pipeline Group will install. In September, Winchester's pressures improved as water demand dropped.

Water Quality Meetings: Operations Engineering, Planning and Water Quality Assurance will meet with each community to discuss current DEP Policies, water quality, hydraulics, lead and MWRA Loan Programs. The following communities met in September: Malden - 09/01; Marblehead - 09/01; Northborough - 09/14; Marlborough - 09/14; and Quincy - 09/26.

Wastewater Operations & Maintenance

- Upgrades to Chelsea Screen House-Contract #7431: Operations Staff continues to assist Construction Staff and the Contractor with the upgrades to the Chelsea Screen House. Staff provided onsite operational support and attended bi-weekly meetings during the First Quarter of FY17 regarding the construction coordination. All gates and screens have been installed and tested by the contractor. The contractor is focusing on completion of the SCADA System, delivery of SCADA Training, activation of the Security System and the installation/testing of Flood Protection Equipment.

- Caruso Pump Station Improvements-Contract #7362: Wastewater Operations Staff continues to work with Construction Staff and the Contractor, by providing onsite operational support and attending bi-weekly Construction Coordination Meetings. The contractor is onsite working on the HVAC System and preparing to replace the facility generator and the breaker for the facility fire pump.

- Union Park Contract Renewal: Operations Staff began the process of renewing the contract for the Management, Operation and Maintenance of the Union Park Pumping Station/CSO Facility. Staff is working with Procurement Staff and BWSC Staff to prepare biddable contract documents with the contract advertised by October 2016 and awarded by December 2016. Operations Staff met with BWSC Operations Staff on September 14th to review and revise the contract documents.

- Braintree Weymouth Hydrogen Peroxide Pretreatment SOP: Operations Staff reviewed and provided comments for the Hydrogen Peroxide Pretreatment SOP. Hydrogen peroxide will be added to the wet well at BWPS, if needed, to reduce the atmospheric hydrogen sulfide levels tributary to the Nut Island Headworks to aid in the facility's odor control process.

- Facility Wet Well Cleaning Program: Operations Staff met with Technical Base Staff and Work Order Coordination Staff to review and revise the wet well cleaning program for all wastewater facilities. The purpose of this program is to ensure wet wells are properly maintained in a timely manner.

Metering

- Meter Systems: Staff worked with MIS to replicate Oracle Reports in SQL, to prepare the Web Module for intranet use, and to put all the wireless meters on a private network. Staff has been assisting on replacement design for Meter 130 in Winchester, with Lexington to provide monitoring of Bedford meters, with Newton to assist with their leak detection efforts.

TRAC

- Penalty Assessment Notice (PAN) issued to 170 West Broadway at LLC and Metric Construction Company on July 6, 2016 for failing to comply with the reporting requirements of its Temporary Construction Site Dewatering Permit. The amount of the penalty is $11,000.00.
- Penalty Assessment Notice (PAN) issued to Absolute Metal Finishing in Norwood, MA on September 22, 2016 in response to Absolute Metal's discharge of wastewater containing excessive levels of cyanide into the MWRA sanitary sewer in violation of EPA limits, MWRA Sewer Use Regulations, Absolute Metal's MWRA Sewer Use Discharge Permit and the April 15, 2015 Notice of Noncompliance and Order (Notice/Order) issued to Absolute Metal by the MWRA. The amount of the penalty is $15,500.00.
- Settlement Agreement between Nova Biomedical Corporation (Nova) and MWRA: TRAC and Nova entered into a Settlement Agreement, effective September 15, 2016, to resolve violations by Nova of MWRA's discharge limit for formaldehyde. The Agreement requires Nova to pay a $100,000.00 administrative penalty and pay stipulated penalties, for a period of two years.

Environmental Quality-Water

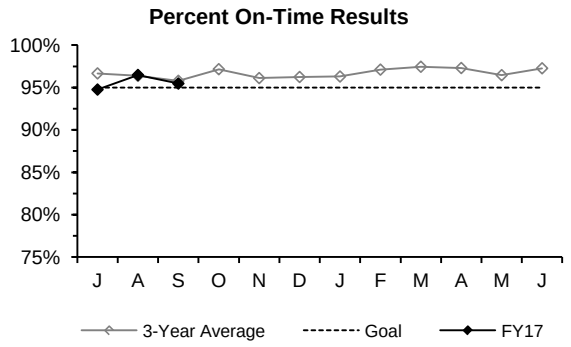
- MWRA Staff ceased periodic algae monitoring at Cosgrove Intake due to sustained low levels of nuisance algae. DCR will continue monitoring until reservoir ice over. Continued sampling for algal toxins, taste and odor compounds at raw and finished water locations.
- On September 12th, a chemical vendor presented information on a liquid-based copper sulfate product. Historical reservoir algae treatments utilize a crystal copper sulfate product. The presentation was given to ENQUAL's Water and Western Operations Staff.
- Staff performed standby reservoir sampling at Chestnut Hill, Norumbega, West, Spot Pond, Fells, Foss and Sudbury open reservoirs in July 2016. Data will be used to develop a routine Standby Reservoir Monitoring Program.
- Staff provided drinking water sampling and testing support from routine sample taps and tank hatches at the Newton Covered Storage Tank on September 15th, and also conducted community-wide chlorine residual data review for Newton.
- On September 22nd, staff gave a presentation to BWSC staff on the Revised Total Coliform Rule, as part of the annual Emergency Response Plan (ERP) Training provided to BWSC.
- Staff distributed reports to all water customers providing analysis of each community's chlorine residuals for each TCR sampling location over a two-year period.
- Staff performed quarterly calibrations or calibration checks on laboratory instrumentation in the CWTP and BWTF Laboratories including Turbidimeters and UVT Analyzers.

Environmental Quality-Wastewater

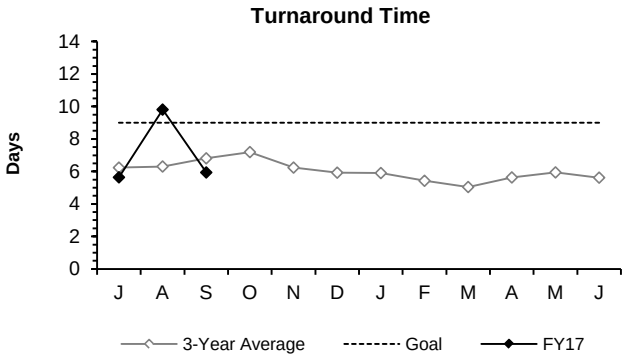
- Harbor/Beach/CSO Monitoring: Biweekly monitoring of the harbor and rivers continued, as did CSO receiving water monitoring under the new daily schedule. Beach monitoring season and daily web updates of data ended on Labor Day. Beach Water Quality Fact Sheets on MWRA web site were updated to include 2016 beach season data.
- In anticipation of a new Clinton Permit, began preparing for revised reporting requirements and drafted staff summary to inform the Board about the permit.
- In compliance with the newly-issued water quality standards variance for Lower Charles River/Charles Basin, began near-real-time web reporting of discharges from Cottage Farm and other MWRA CSO Treatment Facilities.

Laboratory Services

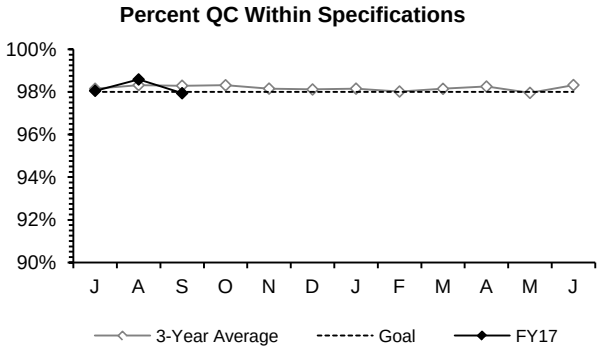
1st Quarter - FY17



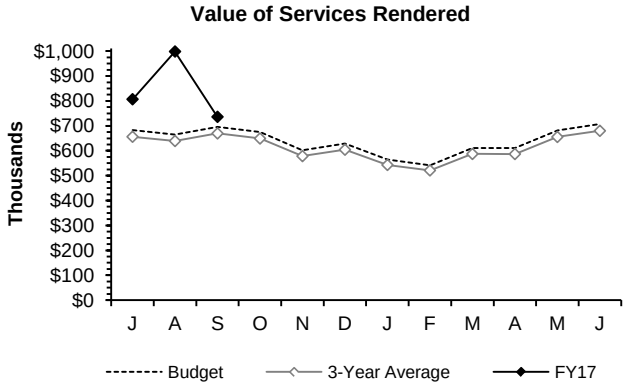
The Percent On-Time measurement was above the 95% goal.



Turnaround Time was faster than the 9-day goal.



Percent of QC tests meeting specifications was at the 98% in-house goal.



Value of Services Rendered was above the seasonally adjusted budget projection due to the School Lead and Annual Lead and Copper projects.

Highlights:

Dr. Delaney has been appointed for a second two-year term on EPA's Environmental Laboratory Advisory Board (ELAB), which advises EPA on laboratory topics. ELAB is a combination of industrial, government, and academic laboratory experts. Presentations on selected ion monitoring gas chromatography-mass spectrometry, cyanide, and sample matrix effects were given at EPA's National Environmental Monitoring Conference in Orange County, CA.

Quality Assurance:
DEP Lab Certification Office performed a 4-day routine audit at the Central Lab. All findings identified were minor and are being rectified before DEP issues its final report.

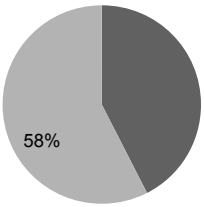
Drinking Water:
We provided rush turnaround time lab testing for metals, organics, cyanide and bacteria in response to a security breach at a water storage tank in Concord.

School Lead:
We continued to test school lead samples from our communities as quickly as they came in. By the beginning of September we had a low backlog of school samples, which allowed us to focus on the annual Lead and Copper Rule samples from our communities. The receipt of large quantities of school samples is expected to resume in October.

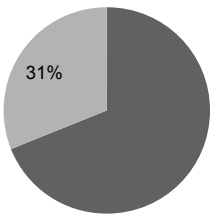
CONSTRUCTION PROGRAMS

Projects In Construction
1st Quarter FY17

Money



Time



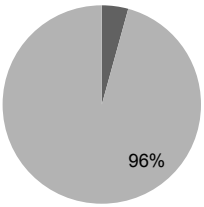
NIH Section 110 Reading & Woburn

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 September, the Contractor installed a local water main and continued installation of the 36-inch water main, installed an 8-inch local water main and replaced a drain line in Oak Street to maintain pace with the installation of the 36-inch water main.

Money



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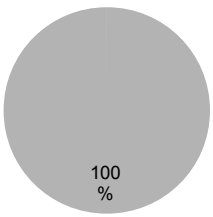


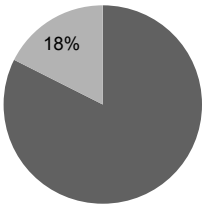
Upgrades to Chelsea Screen House

Project Summary: This project involves the replacement of two dry side screens, seven gates and the rehabilitation of two wet side screens and the addition of two new gates. Also, a SCADA system will be added to the wet side to allow for remote wet weather operation.

Notice to Proceed: 4-Aug-2015 *Contract Completion:* 30-Sep-2018

Status and Issues: As of September the Contractor continued work on the Facility's slide gates and screens. They continued with the electrical work as well as SCADA work. Substantial completion was achieved as of 9-30-16

Money



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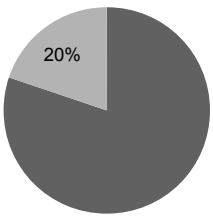


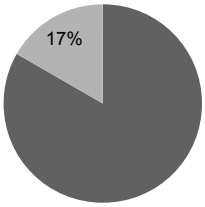
Wachusett Aqueduct Pumping Station

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

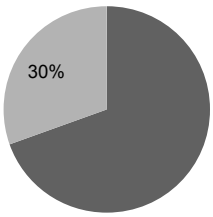
Notice to Proceed: 1-Mar-2016 *Contract Completion:* 14-Feb-2019

Status and Issues: As of September, the Contractor formed and tied rebar for the concrete walls of the influent/overflow channel and wet well. They excavated and installed conduits, rebar and concrete for the duct banks and paved the trench.

Money



Time



Alewife Brook Pump Station Improvements

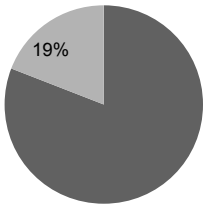
Project Summary: This project involves the replacement of wet-weather pumps, motors, gear drives, VFD's, MCC, screens, sluice gates, standby generator, roof, PLC's and HVAC. Also, the remediation of PCB's and asbestos and the installation of a flow meter on the 66-inch downstream Alewife Brook Conduit.

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

Status and Issues: As of September, the Contractor demolished the retaining wall at the screen room and began the rebar installation. Additional work included dewatering of the cofferdam and the formation of the base slab of the discharge structure.

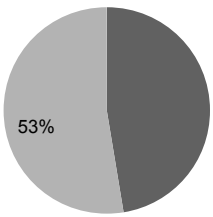
Projects In Construction
1st Quarter FY17

Money



Amount Remaining
Billed to Date

Time



Days Remaining
Days Expended

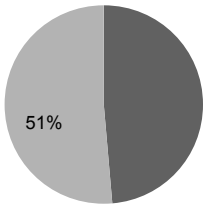
Caruso Pump Station Improvements

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: 24*-Mar-2017

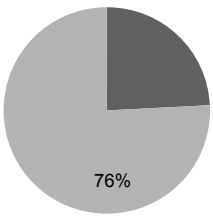
Status and Issues: As of September, the Contractor demolished AHU-3 and the 2nd floor supply ductwork for the hallway, men's and ladies rooms. MWRA staff oversaw the inspection of utilities imbedded in concrete and block walls, floor and ceiling in preparation of coring for electrical conduit penetrations.

Money



Amount Remaining
Billed to Date

Time



Days Remaining
Days Expended

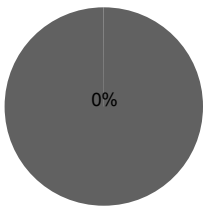
DITP Valves and Piping Replacements

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

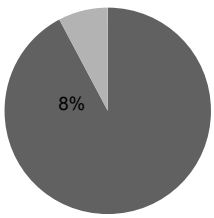
Status and Issues: The Contractor completed installation of the 12" PSC bypass pipe in the Residual Galleries. The PSL-A piping installation is approximately 98% complete.

Money



Amount Remaining
Billed to Date

Time



Days Remaining
Days Expended

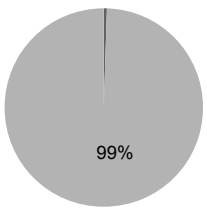
Winthrop Terminal VFD and Motor

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

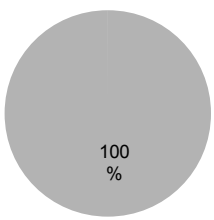
Status and Issues: The Contractor, JFW has begun preparing major equipment submittals. No physical work took place.

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 total punchlist work is 50% complete. The material for the tip tube extensions has been installed.

CSO CONTROL PROGRAM
1st Quarter – FY17

All 35 projects in the Long-Term CSO Control Plan are complete, in compliance with Schedule Seven. As of September 30, 2016, remaining CSO related capital spending totaling $13 million is authorized and scheduled 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 CSO post-construction monitoring and performance assessment (2018-2020).

Project/Item	Status as of September 30, 2016
Reserved Channel Sewer Separation	BWSC attained substantial completion in December 2015, in compliance with Schedule Seven. BWSC continues to prepare as-built plans and close out its engineering and construction contracts. MWRA staff are conducting final eligibility reviews of the construction contracts for this and other CSO projects that were implemented by BWSC with MWRA funding.
South Dorchester Bay Sewer Separation Post-Construction Inflow Removal	As previously reported, BWSC has completed its investigation of alternatives for removing additional stormwater inflow from its Dorchester Interceptor, following completion of sewer separation and the closing of CSOs several years ago. MWRA's CIP includes $5.4 million for the inflow removal effort, of which $2.7 million has been transferred to the BWSC CSO account and $1.8 million of that has been withdrawn by BWSC to fund related design and construction work. Staff recently requested updated information from BWSC regarding its remaining system needs and its use of the remaining $3.6 million.
Cambridge/Alewife Brook Sewer Separation	The City of Cambridge attained substantial completion and permanently closed Outfall CAM004 in December 2015, in compliance with Schedule Seven. Extensive surface restoration work eligible for MWRA funding at a remaining award amount of $7.3 million is currently scheduled to continue through June 2017. Staff continue to obtain information to support review of Cambridge's request for an amendment to the CSO Memorandum of Understanding and Financial Assistance Agreement ("MOU/FAA") that would increase the total award amount by $1.6 million, from $98.7 million to $100.3 million and extend the MOU/FAA term by six months to December 2017 due to construction change orders and Cambridge's necessity to complete its ineligible water main replacement prior to completing CSO-eligible roadway restoration on Huron Avenue.
MWRA CSO Performance Assessment	Staff are evaluating system wet weather performance and performance predictions, including comparisons of MWRA and community meter data to MWRA model predictions. This is an early effort in support of developing an approach and scope for the three-year performance assessment Schedule Seven requires MWRA to conduct in the period 2018-2020. The Charles River and Alewife Brook/Upper Mystic River CSO variances recently extended by DEP to 2019 include a requirement that MWRA submit a draft scope to DEP by May 2017. MWRA's FY17 CIP includes funds for the three-year performance assessment.

CIP Expenditures
1st Quarter FY17

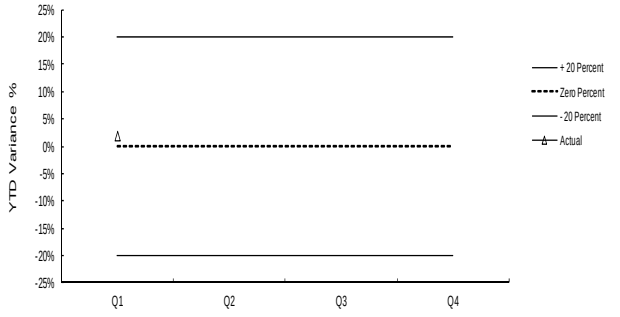
The Year-To-Date variances are highlighted below:

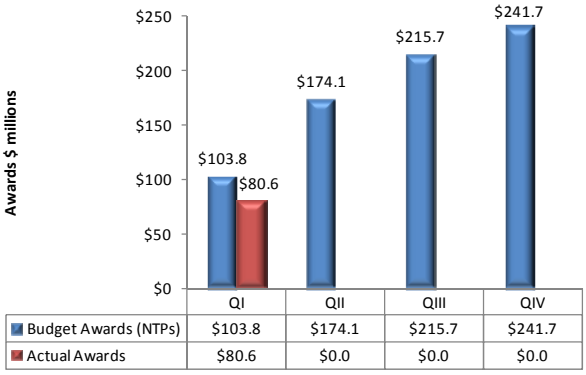
FY17 Capital Improvement Program Expenditure Variances through September by Program ($000)				
Program	FY17 Budget Through September	FY17 Actual Through September	Variance Amount	Variance Percent
Wastewater	11,227	13,082	1,855	17%
Waterworks	13,516	12,499	(1,017)	-8%
Business and Operations Support	1,645	1,460	(185)	-11%
Total	$26,388	$27,041	$653	2%

Overspending within Wastewater is primarily due to contractor progress on the Alewife Brook Pump Station Construction, Deer Island Fuel Oil System Upgrades, Digester Sludge Pump Phase 2, and Clinton Phosphorus Reduction contracts, as well as the timing of spending for the completion of the Chelsea Screenhouse upgrade contract. This was partially offset by less than anticipated progress for the Caruso Pump Station Improvements and construction issues with the North Main Pump Station and Winthrop Terminal Facility Butterfly Valve Replacement Construction contracts. Underspending in Waterworks is primarily due to construction issues resulting in less than anticipated progress for the Wachusett Aqueduct Pump Station Construction, timing of work for the Section 36/W11 C/S- A11 Valve contract, and slower than anticipated progress for the Rosemary Brook Building Repairs and Beacon Street Line Construction contracts. This was partially offset by additional work for the Webster Avenue Bridge Pipe Replacement Construction, timing of community water loan requests, and contractor progress for the Quabbin Power, Communications and Security contract.

CIP Expenditure Variance

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 9/24/2016	$97.9 million
Unused capacity under the debt cap:	$1.218 billion
Estimated date for exhausting construction fund without new borrowing:	MAR-17
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding: Commercial paper capacity:	$128 million $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

1st Quarter – FY17

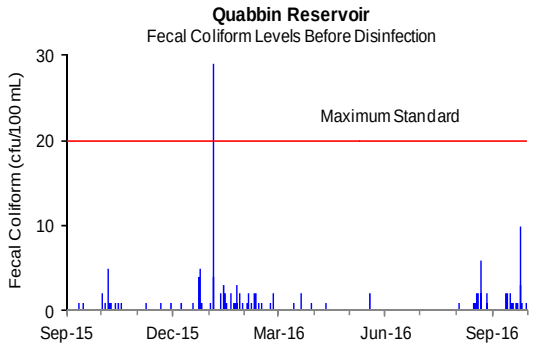
Source Water – Microbial Results

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

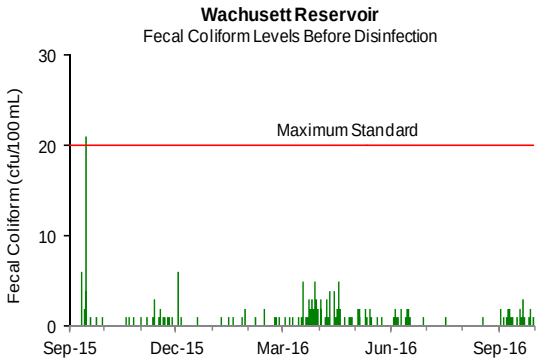


Sample Site: Wachusett Reservoir

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

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

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

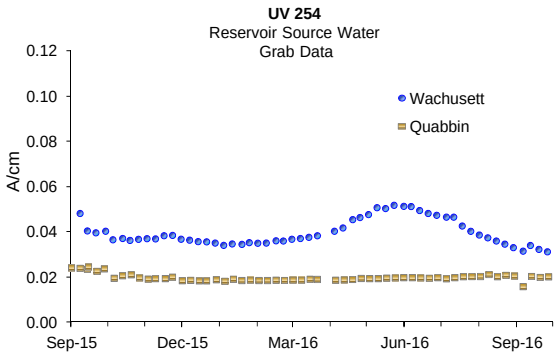


Source Water – UV Absorbance

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

Quabbin Reservoir UV-254 levels are currently around 0.020 A/cm.

Wachusett Reservoir UV-254 levels are currently around 0.031 A/cm.



Source Water – Turbidity

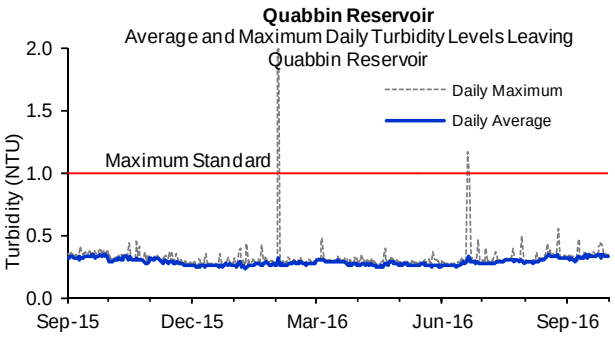
1st Quarter – FY17

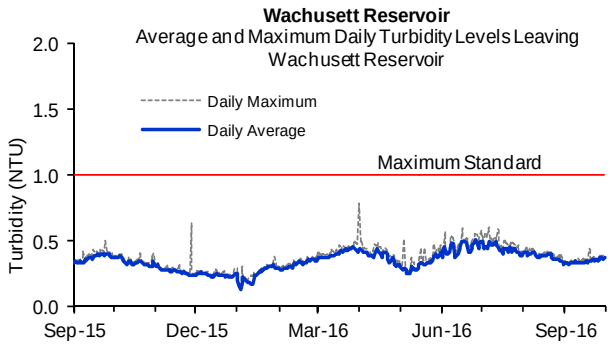
Turbidity is a measure of suspended and colloidal particles including clay, silt, organic and inorganic matter, algae and microorganisms. The effects of turbidity depend on the nature of the matter that causes the turbidity. High levels of particulate matter may have a higher disinfectant demand or may 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 Quabbin and Wachusett were within DEP standards for the quarter.



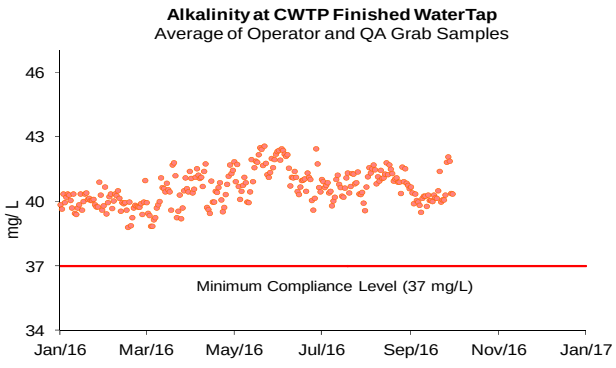


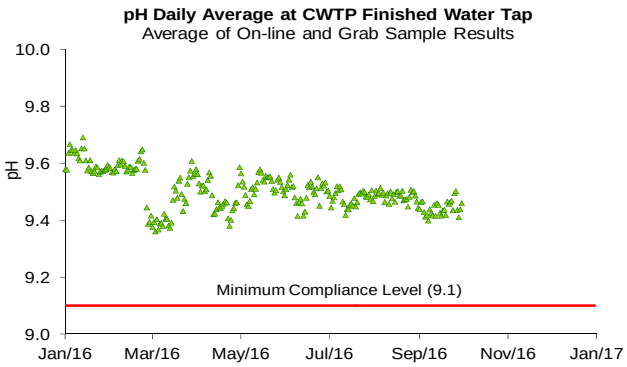
Treated Water – pH and Alkalinity Compliance

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

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

Distribution system samples were collected on September 7 and 8, 2016. Distribution system sample pH ranged from 9.3 to 9.7 and alkalinity ranged from 39 to 43 mg/L. No sample results were below DEP limits for this quarter.





Treated Water – Disinfection Effectiveness

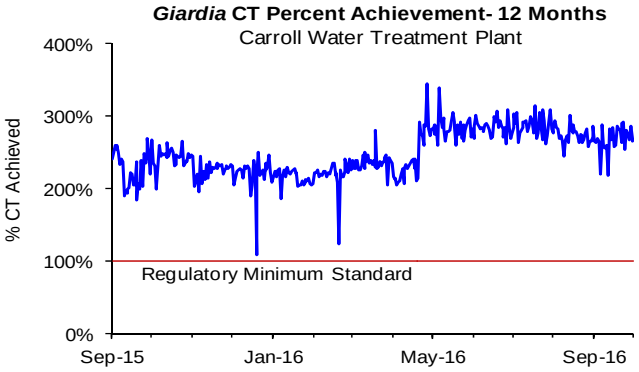
1st Quarter – FY17

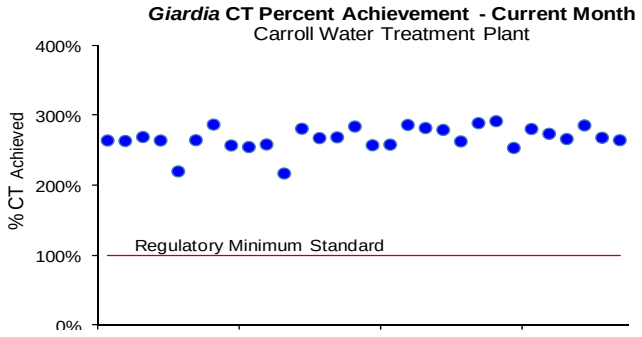
At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA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

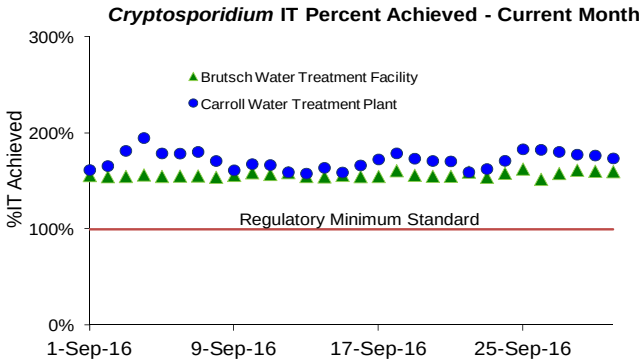
- Ozone dose at the CWTP varied between 1.0 to 2.0 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.

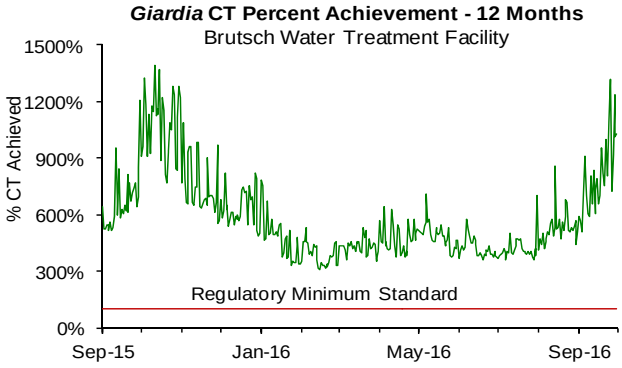


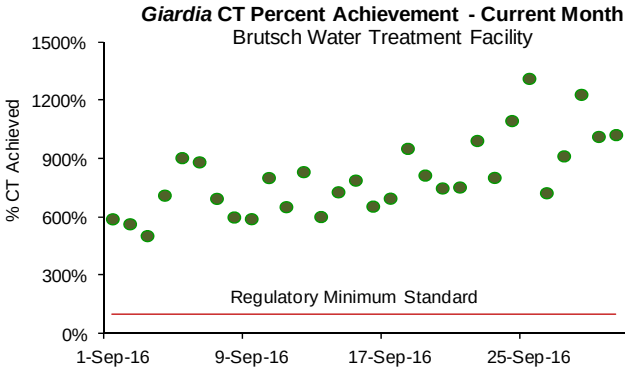


Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- 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 1.6 to 1.8 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system for the quarter.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.







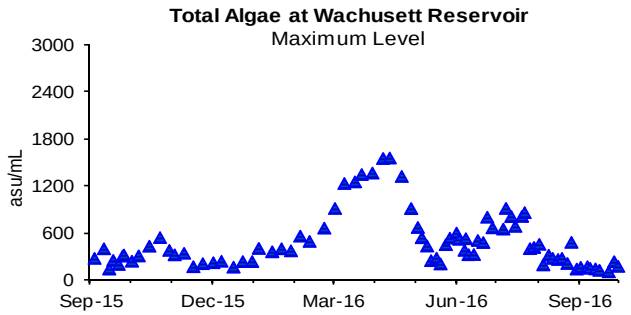
Source Water - Algae

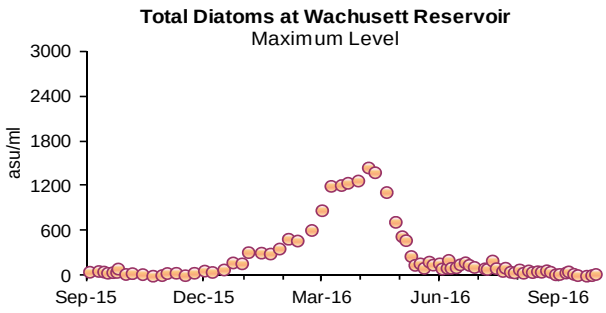
1st Quarter – FY17

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 1st Quarter, one complaint which may be related to algae was reported from a local water department.





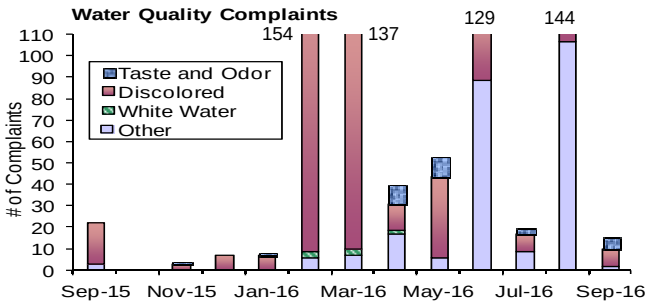
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

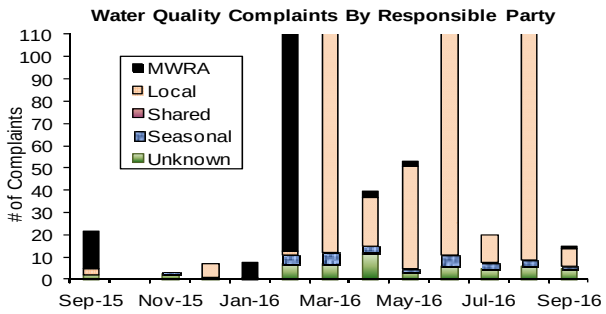
MWRA collects information on water quality complaints that typically fall into four categories: 1.) discoloration due to MWRA or local pipeline work; 2.) taste and odor due to algae blooms in reservoirs or chlorine in the water; 3.) white water caused by changes in pressure or temperature that traps 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 179 complaints during the quarter compared to 72 complaints for 1st Quarter of FY15. Of these complaints, 50 were for "discolored water" and 11 were for "taste and odor", and 118 were for "other". Of these complaints, 154 were local community issues, 2 were MWRA related, 7 were seasonal in nature, and 16 were unknown in origin.

•On August 2, Saugus reported one hundred no water complaints when a gate valve replacement was being performed.





Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

1st 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 142 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 1st Quarter, 14 of the 6,512 community samples submitted to MWRA labs for analysis tested positive for total coliform. Six of the 1,986 MWRA samples tested positive for total coliform. Three communities were required to conduct a Level 1 assessment since they had more than one positive total coliform sample (Bedford – August; South Hadley FD1, Winthrop - September). These were submitted to DEP within the required timeframe. On July 20, Finished Water Tap B at CWTP tested positive for total coliform and *E.coli*. All repeat samples were coliform free. Only 1.5 % 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 [e] Level 1 / 2	Violation [f]	Minimum Chlorine Residual (mg/L)	Average Chlorine Residual (mg/L)
MWRA		MWRA Locations	403	5 (1.24%)	1		1.92	2.57
	d	Shared Community/MWRA sites	1583	1 (0.06%)	0		0.03	2.13
		Total: MWRA	1986	6 (0.30%)	1	☐ / ☐	0.03	2.22
Fully Served		ARLINGTON	168	0 (0%)	0	☐ / ☐	0.13	1.86
		BELMONT	216	0 (0%)	0	☐ / ☐	0.07	1.63
		BOSTON	781	0 (0%)	0	☐ / ☐	1.23	2.41
		BROOKLINE	224	0 (0%)	0	☐ / ☐	0.56	2.16
		CHELSEA	169	0 (0%)	0	☐ / ☐	1.32	2.04
		DEER ISLAND	52	0 (0%)	0	☐ / ☐	1.64	2.14
		EVERETT	169	0 (0%)	0	☐ / ☐	0.75	2.26
		FRAMINGHAM	234	0 (0%)	0	☐ / ☐	0.37	2.20
		LEXINGTON	117	0 (0%)	0	☐ / ☐	1.13	2.26
		LYNNFIELD	18	0 (0%)	0	☐ / ☐	0.93	1.74
		MALDEN	238	1 (0.42%)	0	☐ / ☐	0.00	1.87
		MARBLEHEAD	72	0 (0%)	0	☐ / ☐	1.65	2.26
		MEDFORD	204	0 (0%)	0	☐ / ☐	1.20	1.86
		MELROSE	117	0 (0%)	0	☐ / ☐	0.18	1.89
		MILTON	101	0 (0%)	0	☐ / ☐	0.01	1.95
		NAHANT	30	0 (0%)	0	☐ / ☐	1.49	2.00
		NEWTON	276	0 (0%)	0	☐ / ☐	0.09	1.98
		NORTHBOROUGH	51	1 (1.96%)	0	☐ / ☐	0.40	2.05
		NORWOOD	99	0 (0%)	0	☐ / ☐	0.03	1.90
		QUINCY	302	1 (0.33%)	0	☐ / ☐	0.26	1.93
		READING	130	0 (0%)	0	☐ / ☐	0.40	1.71
		REVERE	180	0 (0%)	0	☐ / ☐	1.29	2.07
		SAUGUS	104	0 (0%)	0	☐ / ☐	1.38	1.96
		SOMERVILLE	272	0 (0%)	0	☐ / ☐	0.76	2.18
		SOUTHBOROUGH	30	0 (0%)	0	☐ / ☐	0.31	2.09
		STONEHAM	91	0 (0%)	0	☐ / ☐	1.84	2.28
		SWAMPSCOTT	57	1 (1.75%)	0	☐ / ☐	0.70	1.72
		WALTHAM	216	0 (0%)	0	☐ / ☐	0.69	2.19
		WATERTOWN	302	0 (0%)	0	☐ / ☐	0.61	2.10
		WESTBORO HOSPITAL	15	0 (0%)	0	☐ / ☐	0.07	0.55
		WESTON	47	0 (0%)	0	☐ / ☐	2.03	2.61
		WINTHROP	79	2 (2.53%)	0	☒ / ☐	0.29	1.90
		Total: Fully Served	*5161*	*6 (0.12%)*				
CVA&Partially Served	b	BEDFORD	66	3 (4.55%)	0	☒ / ☐	0.46	1.82
		CANTON	87	0 (0%)	0	☐ / ☐	0.03	1.17
		HANSCOM AFB	27	0 (0%)	0	☐ / ☐	0.07	1.71
		MARLBOROUGH	127	0 (0%)	0	☐ / ☐	0.08	2.49
		NEEDHAM	126	1 (0.79%)	0	☐ / ☐	0.08	1.00
		PEABODY	237	1 (0.42%)	0	☐ / ☐	0.22	1.87
		WAKEFIELD	147	0 (0%)	0	☐ / ☐	0.96	1.94
		WELLESLEY	106	0 (0%)	0	☐ / ☐	0.04	1.11
		WILMINGTON	85	0 (0%)	0	☐ / ☐	0.12	1.88
		WINCHESTER	91	0 (0%)	0	☐ / ☐	0.13	1.83
		WOBURN	195	0 (0%)	0	☐ / ☐	0.19	1.18
	c	SOUTH HADLEY FD1	57	3 (5.26%)	0	☒ / ☐	0.17	0.59
		Total: CVA & Partially Served	*1351*	*8 (0.59%)*				
		Total: Community Samples	*6512*	*20 (0.21%)*				

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

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

1st Quarter – 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.

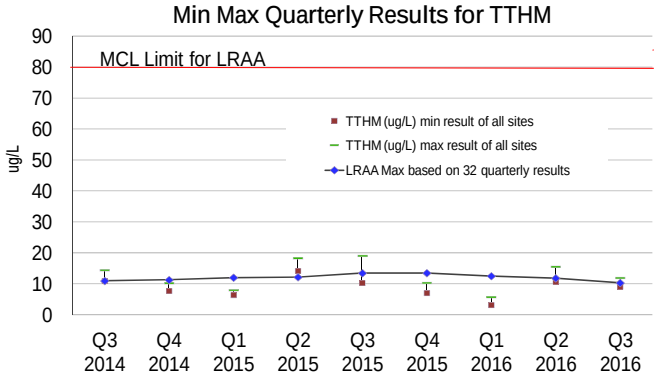
The locational running annual average at each individual sampling location must be below the standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

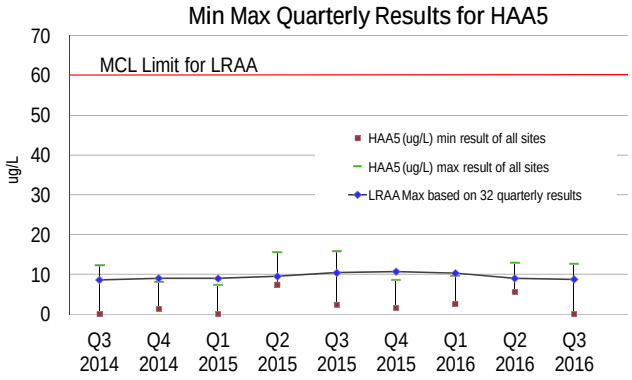
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1).

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 ug/L.

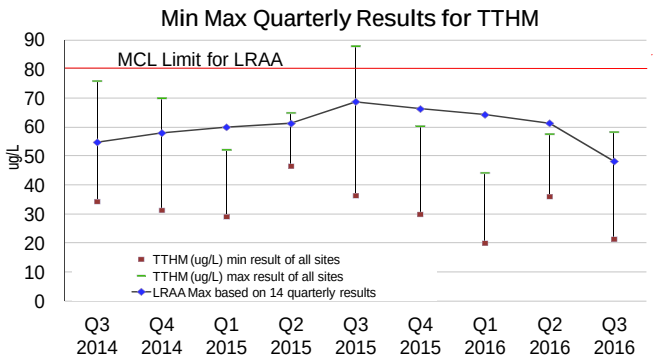
The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 10.4 ug/L; HAA5s = 8.8 ug/L. The current RAA for Bromate = 0.0 ug/L. CVA's DBP levels continue to be below current standards.

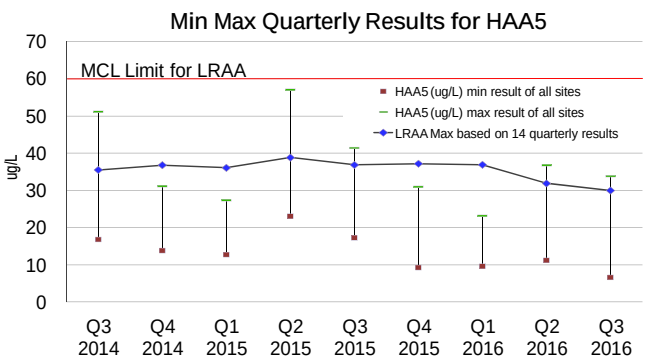
MetroBoston Disinfection By-Products





CVA Disinfection By-Products (Combined Results)





Water Supply and Source Water Management

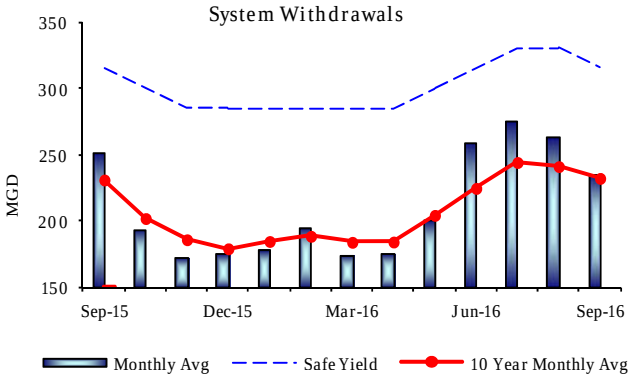
1st Quarter – FY17

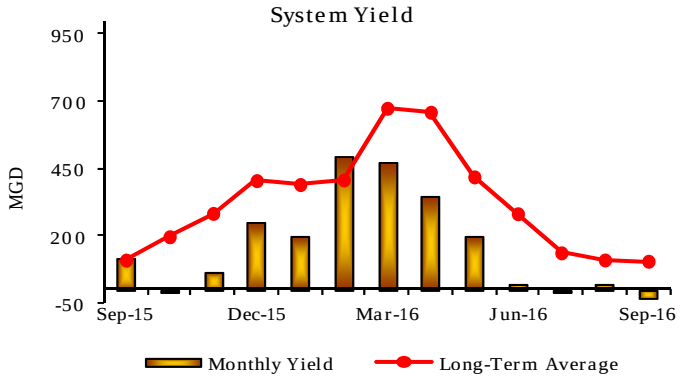
Background

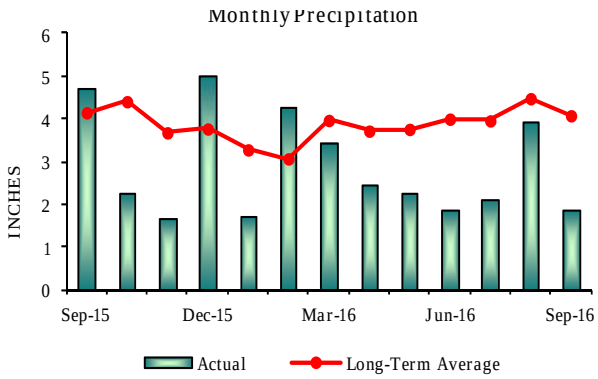
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir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

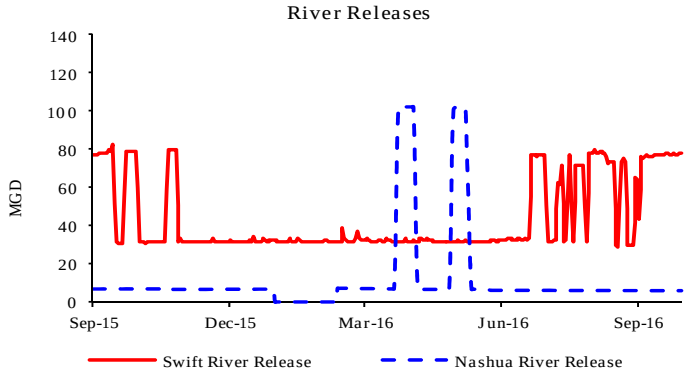
Outcome

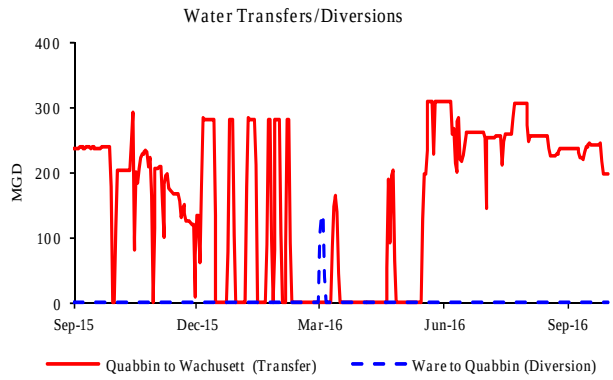
Quabbin Reservoir level remained within the normal operating range for this period of the year. The volume of the Quabbin Reservoir was at 82.5% as of September 30, 2016; a 7.6% decrease for the quarter, which represents a loss of more than 31 billion gallons of storage. Yield and precipitation for the quarter were below their respective quarterly long term averages. System withdrawal for the quarter is above the 10 year monthly average.

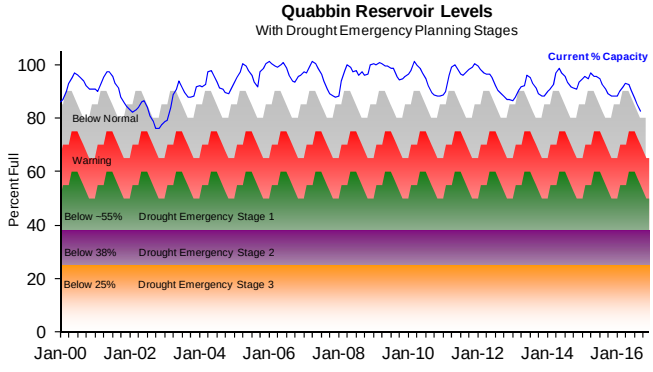












WASTEWATER QUALITY

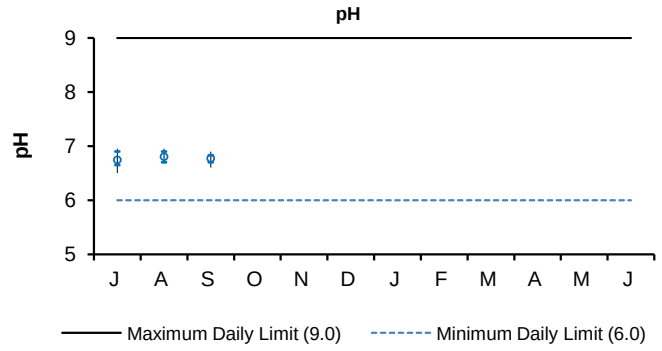
NPDES Permit Compliance: Deer Island Treatment Plant

1st Quarter - FY17

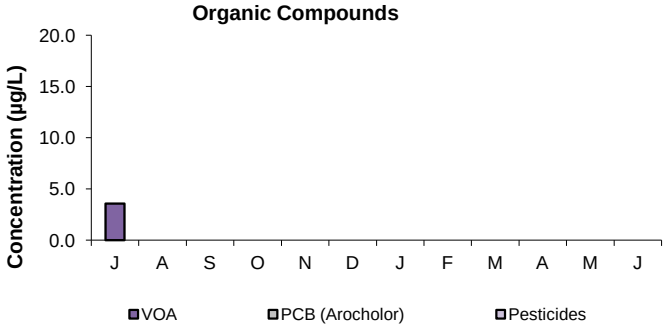
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*July*	*August*	*September*	*1st Quarter Violations*	*FY17 YTD Violations*
Dry Day Flow:		mgd	436	256.7	254.9	253.9	0	0
cBOD:	Monthly Average	mg/L	25	4.9	4.6	5.5	0	0
	Weekly Average	mg/L	40	6.3	4.9	6.5	0	0
TSS:	Monthly Average	mg/L	30	7.7	6.4	6.8	0	0
	Weekly Average	mg/L	45	9.7	7.3	7.5	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	6	6	7	0	0
	Weekly Geometric Mean	col/100mL	14000	14	14	13	0	0
	% of Samples >14000	%	10	0	0	0	0	0
	Consecutive Samples >14000	#	3	0	0	0	0	0
pH:		SU	6.0-9.0	6.5-7.0	6.7-7.0	6.7-7.2	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	100	100	100	0	0
	Inland Silverside	%	≥1.5	50	50	25	0	0

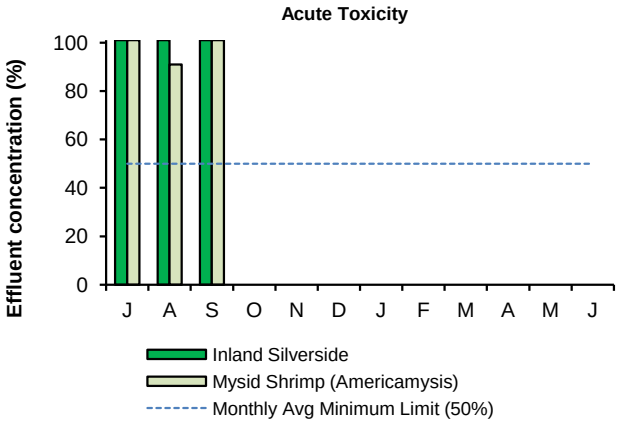
There have been no permit violations in FY16 to date at the Deer Island Treatment Plant.



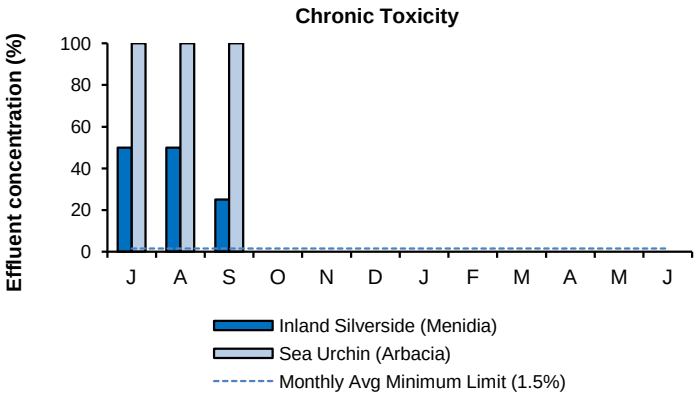
pH is a measure of alkalinity or acidity. Fluctuations in effluent pH are unlikely to impact on marine environments, which have significant buffering capacity. Because of the pure oxygen used in the activated sludge process, effluent pH tends to be at the lower end of the permit-required range. All pH measurements for the 1st 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 1st Quarter, some volatile organic compounds were detected in the effluent in July. All other organic compounds were below the detection limit for the quarter.



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



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

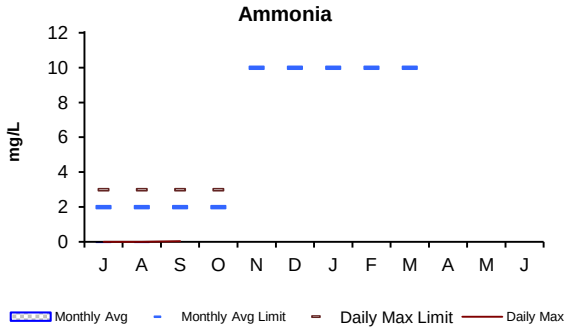
NPDES Permit Compliance: Clinton Wastewater Treatment Plant

1st Quarter - FY17

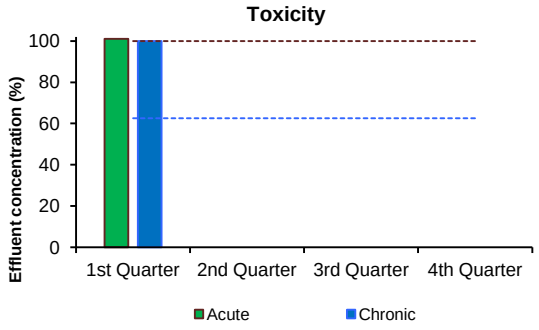
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*July*	*August*	*September*	*1st Quarter Violations*	*FY17 YTD Violations*
Flow:		mgd	3.01	2.45	2.39	2.33	0	0
BOD:	Monthly Average:	mg/L	20	2.0	2.0	2.3	0	0
	Weekly Average:	mg/L	20	2.5	2.5	2.4	0	0
TSS:	Monthly Average:	mg/L	20	3.9	3.5	2.7	0	0
	Weekly Average:	mg/L	20	5.7	4.3	3.0	0	0
pH:		SU	6.5-8.3	7.1-7.6	7.0-7.4	7.1-7.7	0	0
Dissolved Oxygen:	Daily Minimum:	mg/L	6	6.9	6.7	6.8	0	0
Fecal Coliform:	Daily Geometric Mean:	col/100mL	400	32	19	9	0	0
	Monthly Geometric Mean:	col/100mL	200	6	4	4	0	0
TCR:	Monthly Average:	ug/L	50	0	0.0	0.0	0	0
	Daily Maximum:	ug/L	50	0.0	0.0	0.0	0	0
Total Ammonia Nitrogen:	June 1 - October 31							
	Monthly Average:	mg/L	2.0	0.00	0.00	0.01	0	0
	Daily Maximum:	mg/L	3.0	0.00	0.00	0.05	0	0
Copper:	Monthly Average:	ug/L	20	9.9	9.0	7.2	0	0
Phosphorus:	May 1 - Oct 31							
	Monthly Average:	mg/L	1.0	--	0.00	0.00	0	0
Acute Toxicity:	Daily Minimum:	%	≥100	*N/A	*N/A	> 100	0	0
Chronic Toxicity:	Daily Minimum:	%	≥62.5	*N/A	*N/A	100	0	0

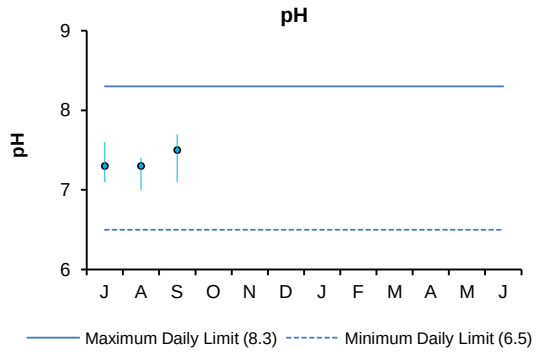
There have been no permit violations in FY17 at the Clinton Treatment Plant.
1st Quarter: There had been no permit violations in the first quarter.
*Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



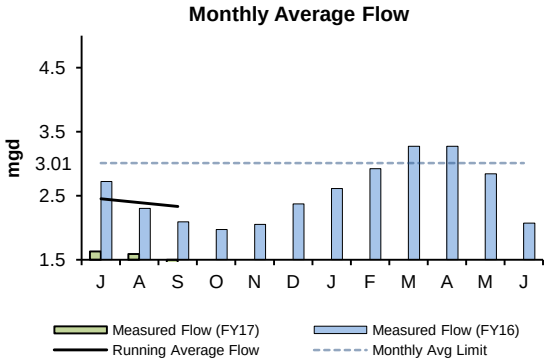
The 1st Quarter's monthly average and daily maximum concentrations were below the permit limits. The monthly average and daily maximum limits for the 1st Quarter are 2 mg/L and 3 mg/L, respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive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



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. Toxicity limits were met during the 1st Quarter.



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



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

COMMUNITY FLOWS AND PROGRAMS

Total Water Use

MWRA Core Customers

1st Quarter - FY17

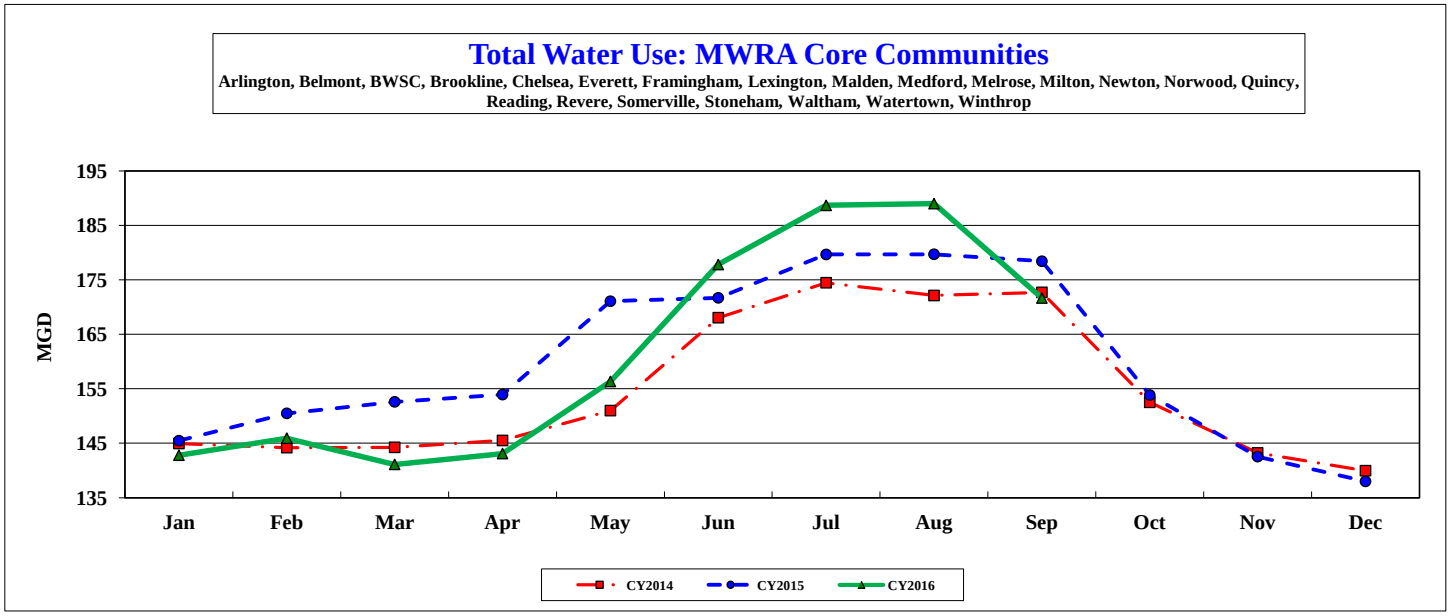
YTD CHANGES (CY16 vs. CY15)
Water Supplied
-1.5%

Water Supplied: MWRA Fully Served Communities*

*** Receive 100% MWRA Water Service**

MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Average
CY2014	144.952	144.193	144.251	145.510	150.994	168.049	174.461	172.119	172.696	152.513	143.221	139.960	155.697	154.461
CY2015	145.466	150.488	152.603	153.932	171.068	171.693	179.652	179.689	178.407	153.846	142.547	138.005	164.899	159.839
CY2016	142.805	145.930	141.117	143.104	156.336	177.803	188.663	188.986	171.658	0.000	0.000	0.000	161.913	161.913

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Total	Total
CY2014	4,493.498	4,037.400	4,471.778	4,365.293	4,680.819	5,041.483	5,408.299	5,335.689	5,180.887	4,727.900	4,296.634	4,338.762	37,834.259	56,378.442
CY2015	4,509.447	4,213.655	4,730.692	4,617.960	5,303.114	5,150.793	5,569.210	5,570.350	5,352.198	4,769.225	4,276.398	4,278.141	45,017.419	58,341.183
CY2016	4,426.966	4,231.967	4,374.642	4,293.123	4,846.430	5,334.082	5,848.546	5,858.579	5,149.726	0.000	0.000	0.000	44,364.060	44,364.060



The September 2016 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 2016 water use will be used to allocate the FY18 water utility rate revenue requirement.

September 2016 water supplied of 230.9 mgd (for revenue generating users) is down 1.3 mgd or 0.5% compared to September 2015. September 2016 water use includes 8.9 mgd provided to the City of Worcester.

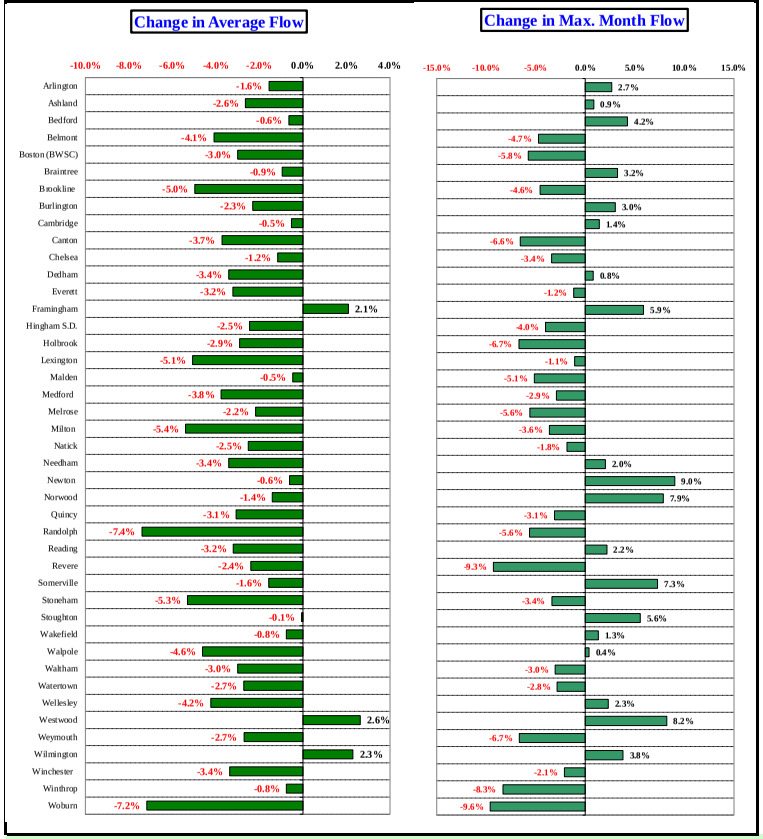
System-wide year to date consumption for CY16 remains higher than CY15 with 206.4 mgd being supplied to MWRA customers **through September**. This is 2.5 mgd higher than CY15, and is an increase of 1.2%.

Community Wastewater Flows

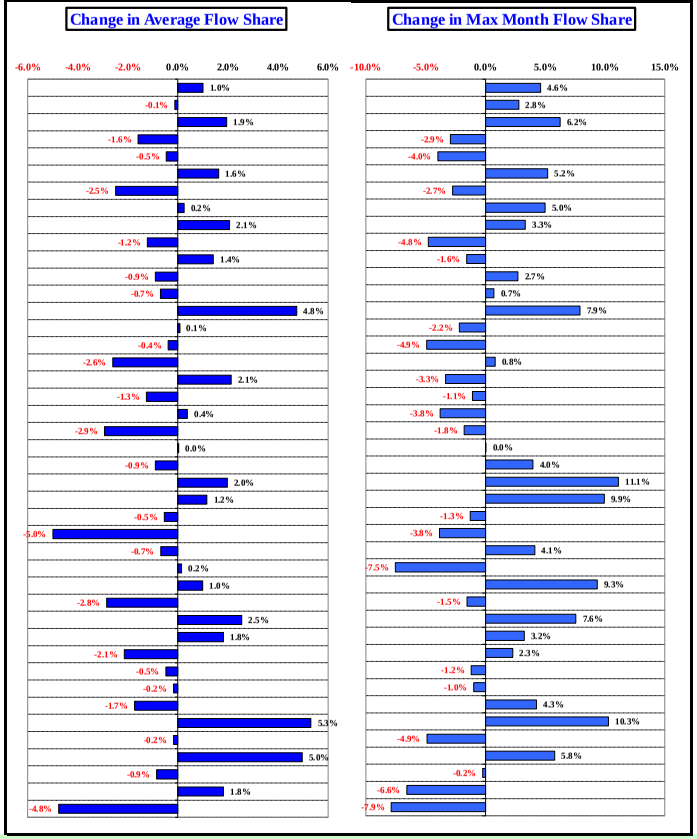
1st Quarter - FY17

How Projected CY2016 Community Wastewater Flows Could Effect FY2018 Sewer Assessments [1,2,3]

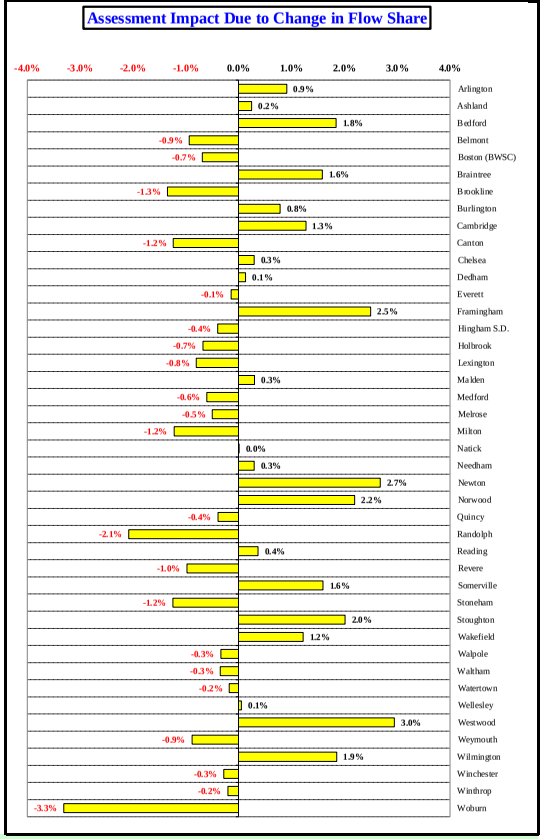
The flow components of FY2018 sewer assessments will be calculated using a 3-year average of CY2014 to CY2016 wastewater flows compared to FY2017 assessments that used a 3-year average of CY2013 to CY2015 wastewater flows.



But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2014 to CY2016 flow share compared to CY2013 to CY2015 flow share, compared to all other communities in the system.



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



Notes:

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

[2] Based on CY2013 to CY2016 average wastewater flows as of 10/12/16. Flow data is preliminary and subject to change pending additional MWRA and community review.

[3] CY2013 to August CY2016 wastewater flows based on actual meter data. September to December 2016 flows based on the average of the prior three years.

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

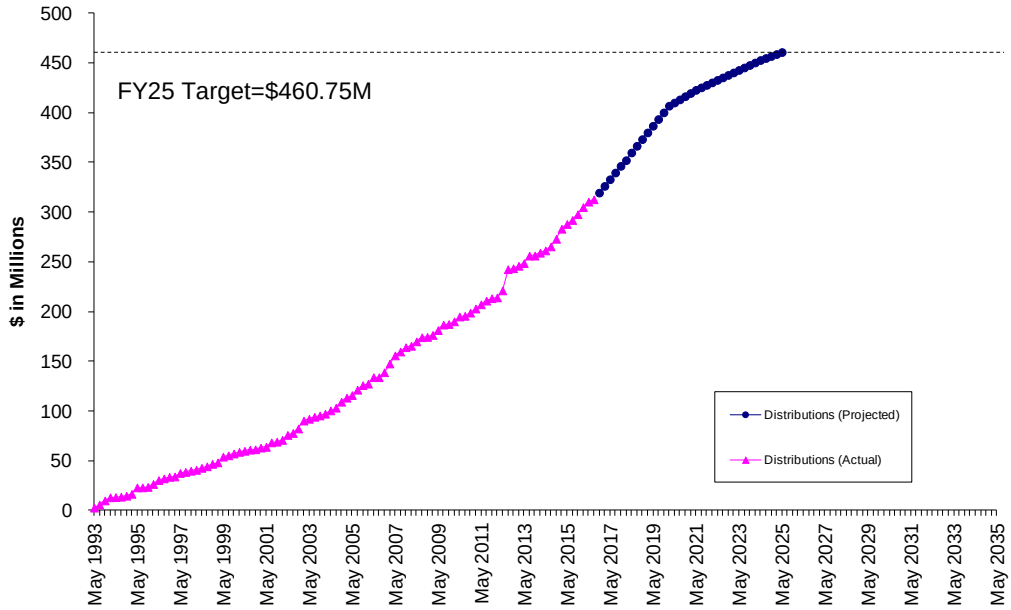
Community Support Programs

1st Quarter – FY17

Infiltration/Inflow Local Financial Assistance Program

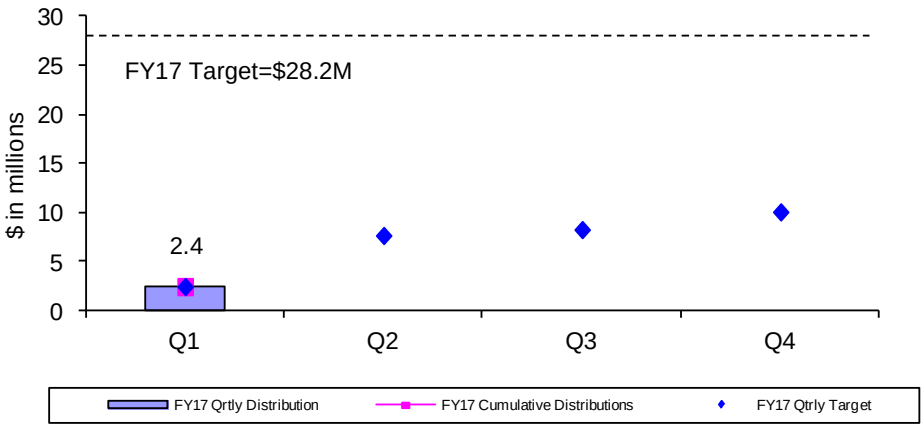
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides $460.75 million in grants and interest-free loans (average of about $14 million per year from FY93 through FY25) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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 1st Quarter of FY17, $2.4 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Everett, Reading and Winchester. Total grant/loan distribution for FY17 is $2.4 million. From FY93 through the 1st Quarter of FY17, all 43 member sewer communities have participated in the program and more than $312 million has been distributed to fund 511 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



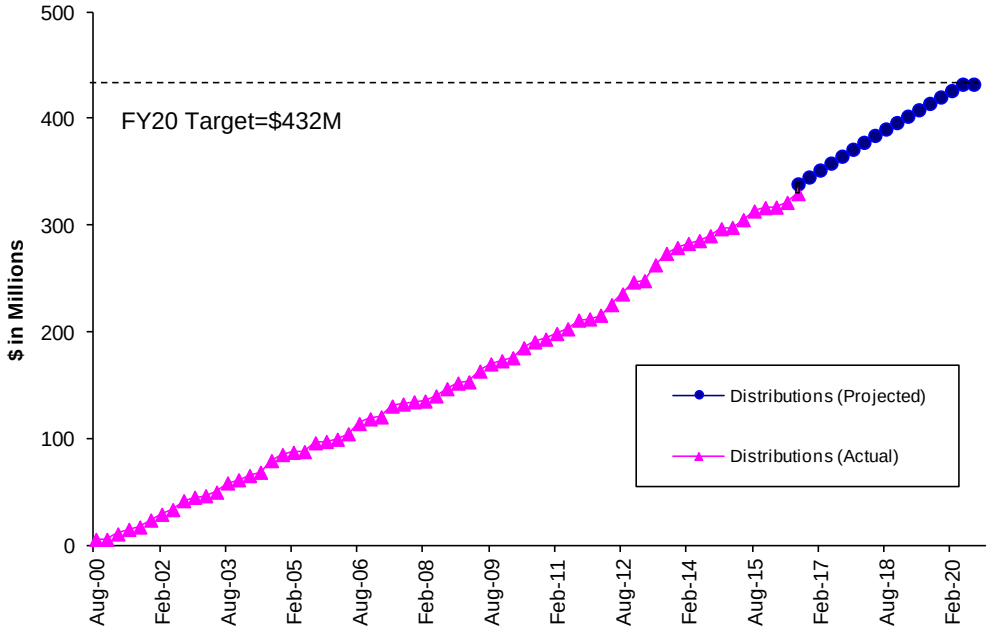
Community Support Programs

1st Quarter – FY17

Local Water System Assistance Program

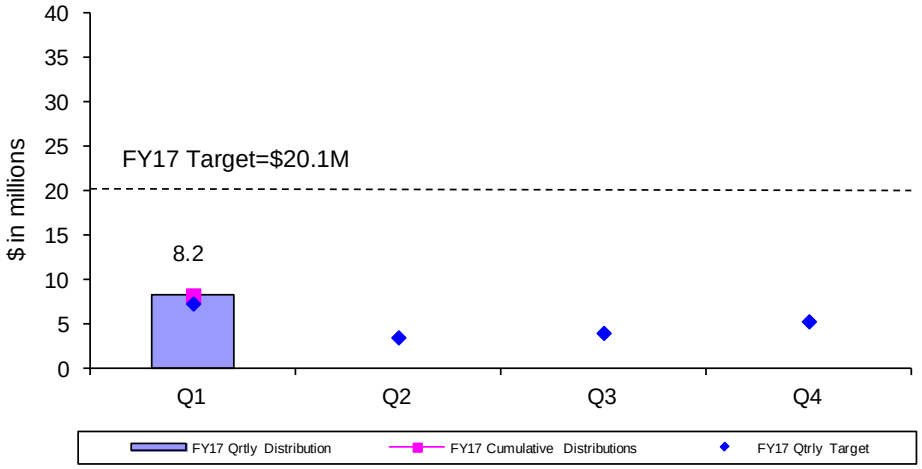
MWRA's Local Water System Assistance Programs (LWSAP) provides $432 million in interest-free loans (an average of about $22 million per year from FY01 through FY20) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. Eligible 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 1St Quarter of FY17, $8.2 million in interest-free loans was distributed to fund local water projects in Boston, Everett, Nahant, Norwood, Quincy and Swampscott. Total loan distribution for FY17 is $8.2 million. From FY01 through the 1st Quarter of FY17, more than $330 million has been distributed to fund 373 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



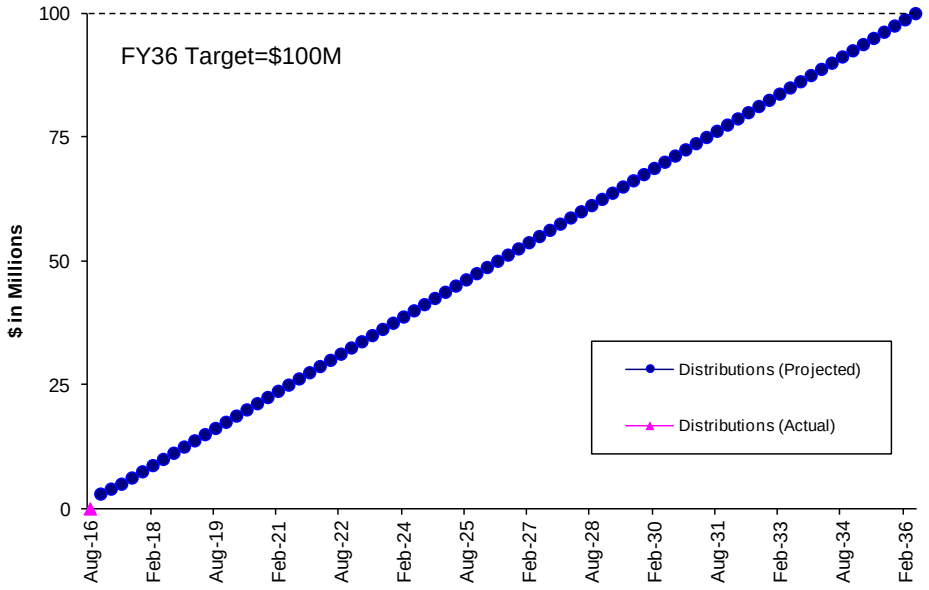
Community Support Programs

1st Quarter – FY17

Lead Service Line Replacement Loan Program

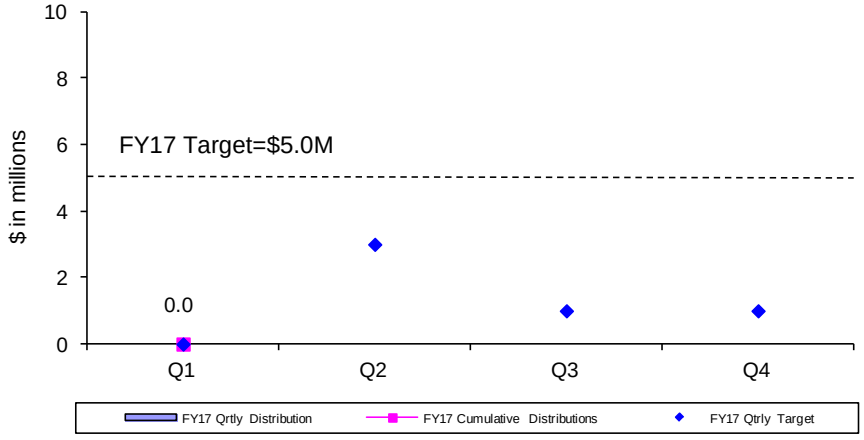
By its vote on March 16, 2016, the Board approved an enhancement to the Local Water System Assistance Program to provide up to $100 million in 10-year zero-interest loans to communities solely for efforts to fully replace lead service lines. The Lead Service Line Replacement Loan Program is also referenced 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.

Lead Service Line Replacement Loan Program Distributions FY17-FY36



FY17 is the first year of the Lead Service Line Replacement Loan Program. During the 1st Quarter of FY17, no interest-free loan funds were distributed to member water communities. Although the Board has not set a time limit for distribution of the approved $100 million in loan funds, for budget purposes, staff have targeted distributions at $5.0 million per year over 20 years.

FY17 Quarterly Distributions of Lead Service Line Replacement Loans

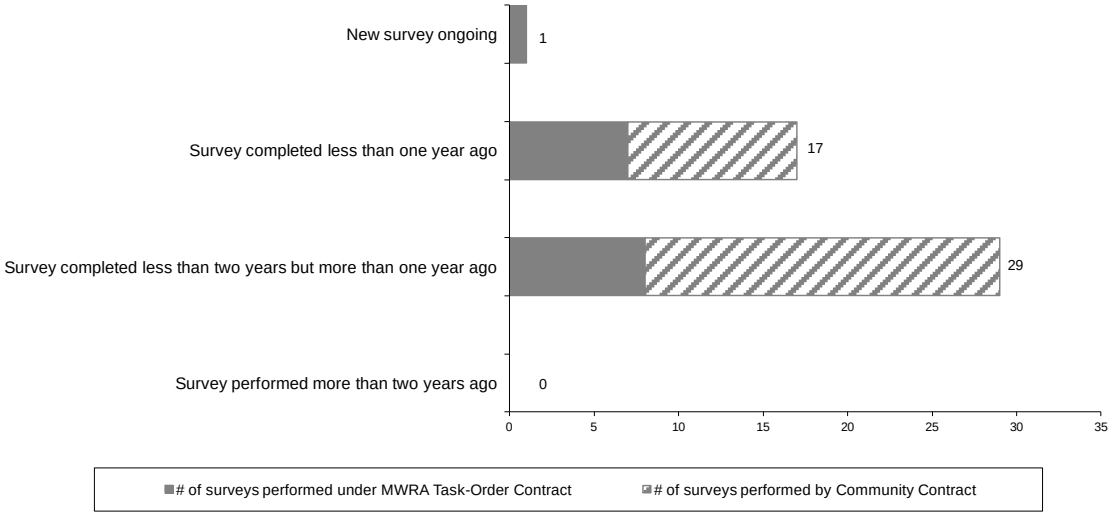


Community Support Programs

1st 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 1st 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				324
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	3,162				3,162
Toilet Leak Detection Dye Tablets	------	2,265				2,265

BUSINESS SERVICES

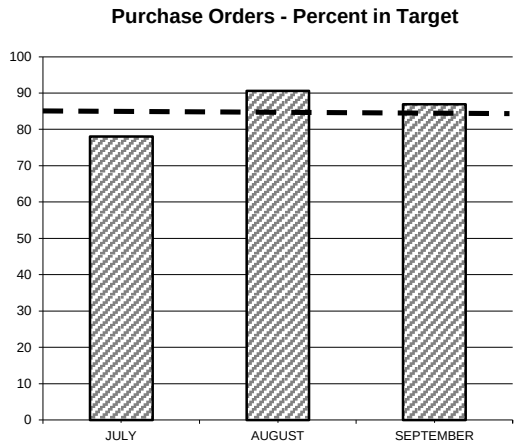
Procurement: Purchasing and Contracts

1st Quarter - FY17

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

Outcome: Processed 86.9% of purchase orders within target; Average Processing Time was 4.69 days vs. 5.92 days in Qtr 1 of FY16. Processed 75% (18 of 24) of contracts within target timeframes; Average Processing Time was 101 days vs. 100 days in Qtr 1 of FY16.

Purchasing



	No.	TARGET	PERCENT IN TARGET
$0 - $500	730	3 DAYS	77.5%
$500 - $2K	745	7 DAYS	90.0%
$2K - $5K	349	10 DAYS	94.2%
$5K - $10K	45	25 DAYS	80.0%
$10K - $25K	49	30 DAYS	89.7%
$25K - $50K	10	60 DAYS	70.0%
Over $50K	19	90 DAYS	89.4%

The Purchasing Unit processed 1,947 purchase orders, 278 less than the 2225 processed in Qtr 1 of FY16 for a total value of $2,639,781 versus a dollar value of $9,316,838 in Qtr 1 of FY16.

The purchase order processing target was not met for the $0 - $500 due to vendor sourcing and the $25k - $50k due to staff summary requirements.

Contracts, Change Orders and Amendments

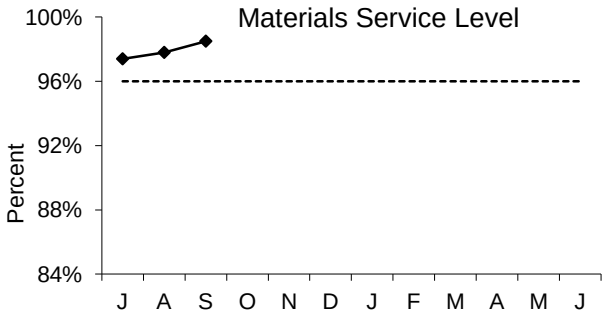
Six contracts were not processed within the target timeframes. One was due to extended negotiations of contract terms and conditions, delaying contract finalization and execution; two were due to timing of award to coincide with expiration of existing task order contracts and delays associated with conforming document approvals and required changes to insurance documents; and another was due to scheduling prioritization (new contract is in place according to schedule and budget needs.) In addition, one contract (Insurance Program Renewal FY17) was not processed within the target timeframe due to additional procurement requirements necessary for insurance services. However, insurance for all categories of coverage was obtained timely and according to schedule. The final contract was not processed within the target timeframe due to the contractor's delay in accepting the MWRA's contractual terms and conditions, resulting in a delay of the notice to proceed.

Procurement processed twenty four contracts with a value of $9,851,658 and eight amendments with a value of $102,694. Twenty six change orders were executed during the period. The dollar value of all non-credit change orders during Q1 FY17 was $1,607,680 and the value of credit change orders was ($2,068,159).

Staff reviewed 71 proposed change orders and 41 draft change orders.

Materials Management

1st Quarter - FY17



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 6,926 (97.9%) of the 7,071 items requested in Q1 from the inventory locations for a total dollar value of $1,421,715.

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 – temperature controller seal kit, pump head and VFD for HVAC; circular saw blade, label cartridges, cables and variable speed drive for Residuals; proximity sensor for I&C; actuator assembly knobs and longitudinal head shaft for Liquid Train; check valves, spring kits, conveyor belts and wear ring cases for Power & Pump.
- Chelsea – tire pressure sensors, power steering hoses, a/c switches and a/c compressors for Fleet Services; fittings, transformer and motor for Field Operations; fuses and lamps for Work Order Coordination; o-rings, fuses, filters and seals for Engineering and Construction; manhole covers and frames for Metro Maintenance; anodes, junction boxes and shunts for Water Operations and Maintenance.
- Southboro – plungers and fittings for Facilities Maintenance; drinking water pump, brush unit and Telog data logger for Quality Assurance; toners for Administration.

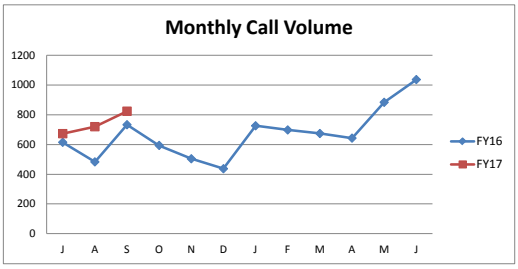
Property Pass Program:

- Six audits were conducted during Q1.
- Numerous obsolete flow switches, keyboards, printers, monitors, power supplies and cameras have been received into Property Pass as surplus. Disposition is being handled as part of our ongoing recycling efforts.
- Scrap revenue received for Q1 amounted to $4,740. Year to date revenue received amounted to $4,740.
- Revenue received from online auctions held during Q1 amounted to $60,930. Year to date revenue received amounted to $60,930.

Items	Base Value July-16	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,108,240	7,942,988	-165,252
Spare Parts Inventory Value	8,841,332	8,736,320	-105,012
Total Inventory Value	16,949,572	16,679,308	-270,264

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

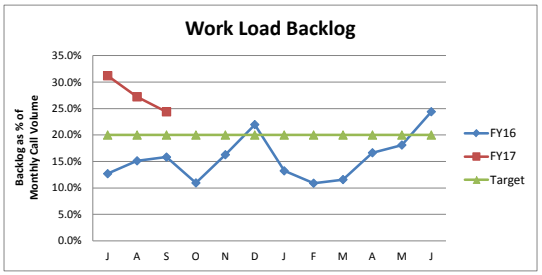
MIS Program
1st Quarter FY17

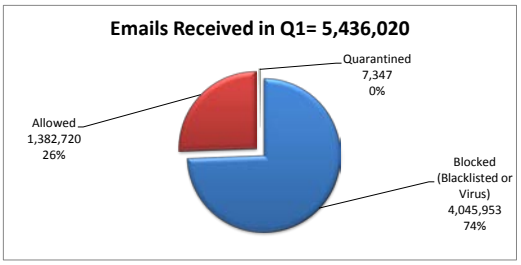


Performance and Backlog

Call Volume: Peaked in September. FY17-Q1 call volume increased by 21% from FY16-Q1.

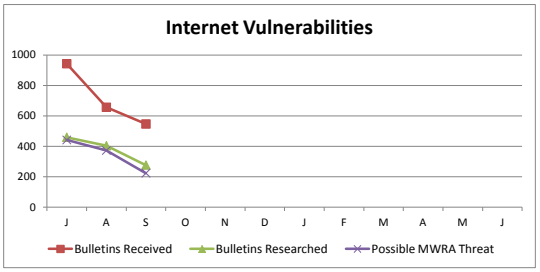
Call Backlog: Peaked in July. FY17-Q1 backlog average is 7.6% above the targeted benchmark of 20%.





Information Security

During Q1, pushed security fixes/updates to desktops/ servers to protect against 336 vulnerabilities. LANDesk Antivirus quarantined 31 distinct viruses from 26 PCs. PCs are current with anti-virus providers' signatures for all known malware.



Infrastructure:

Citrix Mobile Application Design and Development: Test and validation of monthly Worx updates. Sharefile job-aid and quick reference guide posted to Pipeline. Office Web Application Server deployed to support View-Only capabilities with Sharefile. XenMobile development environment built. Developing upgrade path for XenMobile server updates in support of iOS10. Scheduling resources for the build of the Disaster Recovery environment.

Applications/Training/Records Center:

Library Catalog Replacement Project (InMagic): Completed design and testing of the new Library Resources Portal Home page and search results pages. Completed integration of O&M manuals into the Library catalog.Created browsable collections for popular categories of documents, and new book and journal issue displays for the home page. Prepared loan records for final switch to new system and prepared list of beta testers and an email invitation for an October go-live with beta-testers. Library operations switched to the new system.

ApplicantPro (Talent Acquisition): Completed a final pass of the Job Templates and made final configuration changes. Created a job aid for Hiring Managers to set up an Outlook rule to forward the "Requisition Needs Approval" email to their delegate. Supported a Hiring Manager presentation in the Chelsea. Began designing data export process for records retention requirements. Went live September 19th and by the end of the 2nd week, 127 applications (22 internal candidates) were received for 21 posted jobs.

Miscellaneous Lawson Support: Successfully ran payroll at DITP Disaster Recovery Site using Bottomline and Century Bank; there were no issues. Met with users to begin documenting requirements for the Hyperion Pillar application replacement. Tested and updated all three Infor/Lawson servers with mandatory BSI Tax software updates. Several staff attended two day NELUG (New England Lawson User Group) Conference.

Lawson-Maximo Interface: Initial programming completed for 15 of 17 of Infor/Lawson-Maximo interface connections, two of which have been tested. Data scrubbing and consolidation continued, predominately focused on the Property Pass database.

Information Security Program: Continue User Awareness Training with the release of three additional training modules added July 1st , to date 79% of all employees have completed all seven modules.

LIMS/Electronic Library Notebook: Several ELN logs were developed and 95% of logs for Phase I have been completed .

Maximo Upgrade Project: Conducted User Acceptance Testing (UAT) of Asset Management and Calibration Applications. Trained 40 staff on Maximo Advanced Asset Management. 30% of Maximo Crystal reports have been converted successfully to the new version.

Library & Records Center: The Library fulfilled 35 research requests, and provided 175 periodicals, standards, books & reports. Research topics included tunnel redundancy, Deer Island archaeology, and the Harbor cable. The Records Center added 182 boxes, handled 415 boxes, disposed of 587 boxes and attended 2 Records Conservation Board Meetings.

IT Training: For the quarter, 60 staff attended 8 classes. 5% of the workforce has attended at least one class year-to-date. 137 staff completed the Information Security Awareness training held in 18 sessions at Chelsea and Deer Island. 42 staff completed MAXIMO 7.6 Advanced Asset Management training. New job-aids were developed for new Audio Visual Equipment installed in conference rooms. The Learning Management System (LMS) hosting Computer-based Training (CBT) was upgraded to version 3.1 on the production server.

Legal Matters

1st Quarter - FY17

PROJECT ASSISTANCE

COURT AND ADMINISTRATIVE ORDER

- **NPDES:** Reviewed EPA's NPDES Application and Program Updates; Reviewed 2015 Outfall Monitoring Overview submittal.
- **Water Quality Variances:** Reviewed final determinations on three-year extensions to water quality variances issued by MADEP for CSO discharges to the Lower Charles River/Charles Basin and to the Alewife Brook/Upper Mystic River.

REAL ESTATE, CONTRACT AND OTHER SUPPORT

- **Deer Island:** Reviewed and provided comments on an agreement for the installation and maintenance of an Irish Memorial on Deer Island.
-
- **Public Access:** Finalized 8(m) permit for Pine Brook Country Club's use of Weston Aqueduct land which allows for public access in conjunction with the Town of Weston and the Weston Forest and Trail Association's 8(m) public access permit.
- **Watershed Preservation Restriction:** Reviewed and approved four (4) Quabbin Reservoir Watershed Acquisitions W-000916; W-000033; W-000960; and W-000970 all in Petersham, MA.
- **Order of Conditions:** Recorded Certificate of Compliance for DEP File 337-1094 related to work at Shaft 5A in Weston.
- **Watertown Section Rehabilitation Contract # 7222:** Drafted Tolling Agreements with the designer and construction contractor for the project.
- **Ogin Energy:** Drafted demand to remove turbine from Deer Island.
- **UAS Certification Process:** Received Drone certification letter from Office of Attorney General.
- **Loring Road and JJCWTP:** Sent Notices of Termination of the PPA with NSTAR for the Loring Road and the Interconnection Services Agreement for the John J. Carroll Water Treatment Plant to allow MWRA to remain in compliance with the safe harbor provisions of U.S. Treasury regulation 1.141-7(f)(3) which permits MWRA to enter into a series of power output agreements, none of which has a term in excess of three years. Successor Agreements will be put in place to replace the current Agreements upon termination.
- **Cross Harbor Cable:** Continued to prosecute and defend the litigation commenced by the Army Corps of Engineers ("ACoE") through the U.S. Attorney regarding an alleged permit violation for failure to place the cable in the location required by permit.
- **Great Esker Park:** Finalized Third and Final Annual Compliance Report pursuant to Admin. Consent Order.

MISCELLANEOUS

- Reviewed and approved sixty-one (61) Section 8(m) Permits.
- Completed final review of lists of files to be disposed under Records Conservation Board Procedures.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

Three demands for arbitration were filed.
A Charge was filed at the Massachusetts Commission Against Discrimination alleging that the MWRA discriminated against an employee on the basis of sex, female.

Matters Concluded

Received an arbitrator's decision in favor of MWRA finding that the MWRA did not violate a collective bargaining agreement when it terminated an employee.

Received a dismissal from the MCAD for lack of probable cause of a charge of discrimination on the basis of race, color, and retaliation.

LITIGATION/TRAC

New Matters

United States (Army Corps of Engineers) v. NStar, Harbor Electric Energy Company and MWRA, U.S. District Court, C.A. No. 16-11470-RGS: The United States, acting on behalf of the Army Corps. of Engineers (ACoE) commenced a civil action in U.S. District Court in Boston against the three defendants seeking to force compliance by them with certain depth requirements in a 1989 permit which allowed HEEC's cross-harbor cable to be placed beneath the Boston Harbor main shipping channel and beneath the Reserved Channel. ACoE asserts that the cable is not at the required permit depths and that its current position will interfere with a major dredging project which is intended to provide multiple "deep-draft" berths for use by MassPort. The complaint seeks as relief either or both (i) injunctive relief compelling the removal or relocation of the cable to bring its depth into compliance with the permit's requirements, or (ii) an assessment of penalties for the non-compliance with the permit. MWRA intends to defend against the lawsuit by asserting that MWRA was a permittee in name only, that MWRA does not own or control the cable, and that NStar and HEEC alone are the responsible parties.

Significant Claim Not in Court

There are no Significant Claims.

Significant Developments

United States (Army Corps of Engineers) v. NStar, et al., U.S. District Court, C.A. No. 16-11470-RGS: MWRA filed its Answer to the Complaint of the U.S. including the assertion of cross-claims seeking indemnification and other relief for the alleged misplacement of the cross harbor cable by NStar and HEEC and alleged non-compliance with the depth requirements of the Army Corps dredging permit. MWRA staff and outside counsel continue to follow developments and scheduling concerning potential interference by cable with Massport's intended deep draft berths (10 and 11). Prepared and filed MWRA's Initial Disclosure statement and provided assistance with opposition to Plaintiff's Motion for Summary Judgment and to co-defendants' motion to dismiss MWRA's cross-claims. Prepared motion papers to dismiss state court appeal so that claims against HEEC and NStar can be asserted as cross-claims in new federal district court lawsuit.

Matters Concluded

Western Surety Company, as Assignee and Subrogee of Interstate Engineering Corp. v. MWRA; Suffolk Superior Court C.A. No. 13-0893F and Western Surety Company, as Assignee and Subrogee of Interstate Engineering Corp.; Suffolk Superior Court C.A. No. 15-2300: The first case, served on MWRA in 2013, arose out of MWRA Contract 7063, Heat Loop Construction 3, Deer Island Treatment Plant, and the work of Interstate Engineering Corp. as the general contractor. MWRA withheld $136,186.99 from Interstate due to a leaking expansion joint that was part of the new primary heating water pipe system installed by Interstate, which had already repaired another new expansion joint that had begun leaking. The withheld amount consisted of retainage plus MWRA's good faith estimate of $100,000.00 as the cost to repair the second leaking expansion joint. During the course of the lawsuit, a third expansion joint (out of four in total) also began leaking. MWRA awarded separate contracts for repair of the second and third leaking expansion joints. Western Surety provided payment and performance bonds for the Heat Loop project. Interstate went out of business shortly after completing its work on the Heat Loop Contract. Western Surety claimed entitlement to the entire amount withheld by MWRA based on an assignment and indemnification agreement executed by Interstate in favor of Western Surety. MWRA's position was that because the cost to repair the failed expansion joints exceeded the sum withheld by MWRA, MWRA owed no money to Interstate, and accordingly, Western Surety had no right of recovery against MWRA.

The second case arose out of MWRA Contract 6966, Gravity Thickener Improvements – Phase I Deer Island Treatment Plant. Interstate was also the general contractor on this project. Western Surety executed and delivered payment and performance bonds to MWRA in the sum of $538,940.00. MWRA paid Interstate $82,555.00, but withheld the Contract balance of $456,385.00 from Interstate as liquidated damages per the Contract, because of Interstate's excessive delay in completing its Contract work. Western's suit sought recovery of the $456,385.00 withheld from Interstate. MWRA and Western Surety agreed to a monetary settlement of $300,000.00 for both cases. Out of the total funds that MWRA withheld on both Contracts, MWRA retained approximately $292,500 in the settlement, which is sufficient to compensate MWRA for its actual costs to repair the defective expansion joints under Contract 7063, and for Interstate's late performance under Contract 6966. The settlement also leaves the performance bonds in place in the event that additional claims under either Contract arise in the future. The parties filed Stipulations of Dismissal with Prejudice with the Superior Court in both cases, and final judgments of dismissal have been entered by the Court.

Subpoenas

During the First Quarter of FY 2017, no new subpoenas were received and no subpoenas were pending at the end of the First Quarter FY 2017.

Public Records

During the First Quarter of FY 2017, nine public records requests were received and four public records requests were closed.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of Sept 2016	As of June 2016	As of March 2016
Construction/Contract/Bid Protest (other than BHP)	3	5	5
Tort/Labor/Employment	1	1	2
Environmental/Regulatory/Other	2	2	2
Eminent Domain/Real Estate	0	0	0
total – all defensive cases	**6**	**8**	**9**
Affirmative cases not in suit:	0	0	0
Other Litigation matters (restraining orders, etc.) MWRA v. Thomas Mercer MWRA v. NSTAR and HEEC	2	2	2
total – all pending lawsuits	**8**	**10**	**11**
Significant claims not in suit:	0	0	2
Bankruptcy	2	2	2
Wage Garnishment	14	14	14
TRAC/Adjudicatory Appeals	0	2	3
Subpoenas	0	0	0
TOTAL – ALL LITIGATION MATTERS	**24**	**28**	**32**

TRAC/MISC.

New Appeals No new cases were received.

Settlement by Agreement of Parties Nova Biomedical Corporation; MWRA Docket No. 16-01

Stipulation of Dismissal Digital Silver Imaging, LLC; MWRA Docket No. 15-02

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

Tentative Decisions No Tentative Decisions were issued in the 1st Quarter FY 2017.

Final Decisions One Final Decision was issued in the 1st Quarter FY 2017.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES

1st Quarter FY17

Highlights

During the 1st quarter, Internal Audit (IA) completed 3 construction labor burden reviews, 2 consultant preliminary reviews and 1 incurred cost audit. Audits of the CNY Building 39 lease and the Griffin Way lease were completed. An assessment of the current controls over mobile equipment, laptops and other electronics, was conducted to determine if controls are adequate and functioning as intended to reduce the risk of loss or theft. The MWRA overhead rate for FY17 was prepared, as well as the rate for the Fore River Railroad Corporation billings.

Status of Recommendations

There were 12 recommendations made in FY17 and 11 of these have been closed. An additional 2 recommendations were closed from prior fiscal years.

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	30	6
Follow-Up Report on Fleet Services Activities (12/31/13)	17	13	4
8(m) Permit Fees (11/17/14)	6	4	2
Records Management (12/5/14)	8	6	2
Unmatched Receipts and Accruals (6/30/15)	10	5	5
Halon Inspections at DITP (9/30/15) & Caruso and DeLauri (12/31/15)	18	15	3
Warehouse Cycle Counts at DITP (11/5/15), Southboro (11/6/15) and Chelsea (12/4/15)	25	18	7
Security System Alarms (3/3/16)	3	1	2
AVL Tracking 2016 (5/6/16)	9	*3*	*6*
MIS Mobile Equipment Asset Tracking (9/26/16)	12	*11*	*1*
Total Recommendations	***144***	***106***	***38***

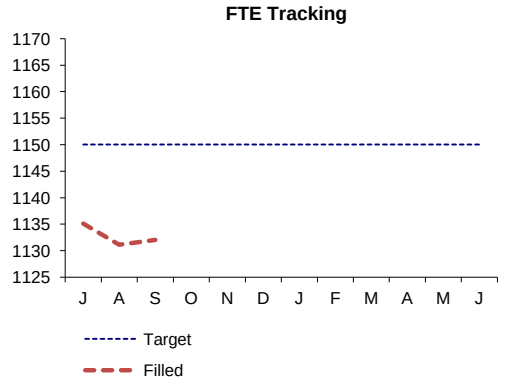
Cost Savings

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.

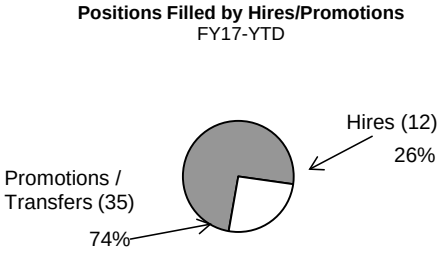
Cost Savings	FY13	FY14	FY15	FY16	FY17 (1Q)	TOTAL
Consultants	$587,314	$294,225	$87,605	$88,312	$3,901	$1,061,357
Contractors & Vendors	$2,153,688	$415,931	$1,146,742	$1,772,422	$323,548	$5,812,331
Internal Audits	$391,083	$923,370	$543,471	$220,929	$54,726	$2,133,579
Total	**$3,132,085**	**$1,633,526**	**$1,777,818**	**$2,081,663**	**$382,175**	**$9,007,267**

OTHER MANAGEMENT

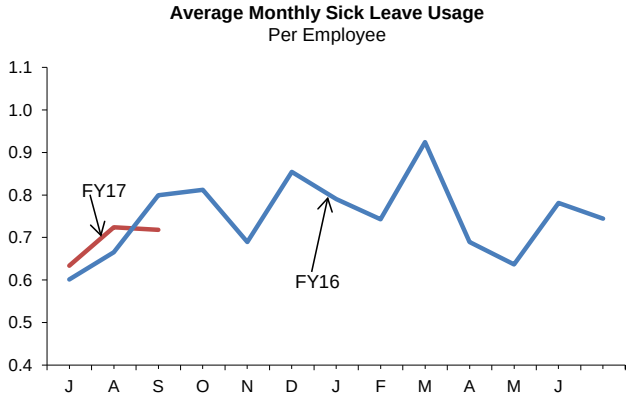
Workforce Management
1st Quarter FY17



FY17 Target for FTE's = 1150
FTE's as of Sept 2016 = 1132



	Pr/Trns	Hires	Total
FY14	111 (69%)	51 (31%)	162
FY15	133 (67%)	65 (33%)	198
FY16	99 (62%)	60 (38%)	159
FY17	35 (74%)	12 (26%)	47



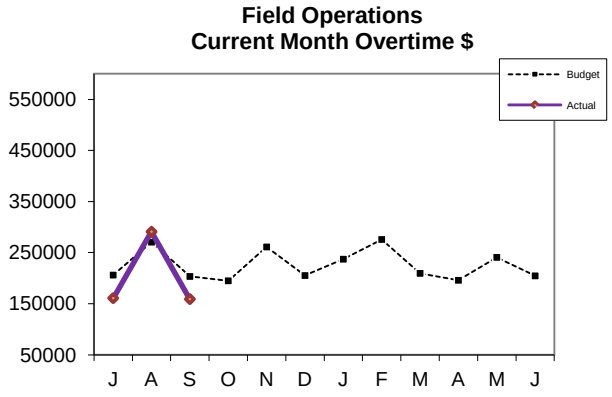
Bitmap Average monthly sick leave for the 1st Quarter of FY17 was approximately the same as the 1st Quarter of FY16 (8.30 to 8.26 days)

Average monthly sick leave for the 1st Quarter of FY17 was approximately the same as the 1st Quarter of FY16 (8.30 to 8.26

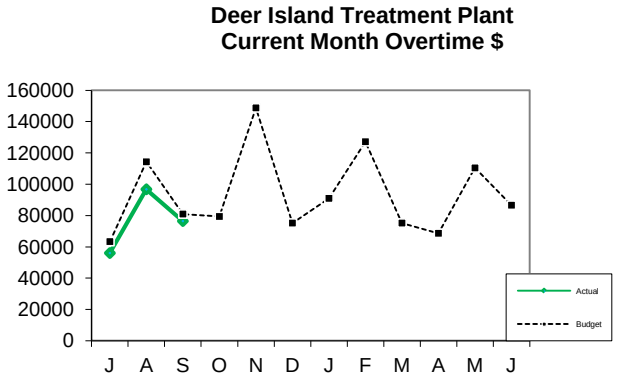
In Q1 of FY17, the average quarterly sick leave usage was approximately the same as last year.

	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY16
Admin	138	1.61	6.45	20.3%	8.29
Aff. Action	5	0.98	3.92	0.0%	8.05
Executive	5	3.62	14.48	22.1%	10.97
Finance	37	1.58	6.33	2.4%	9.70
Int. Audit	7	1.51	6.06	65.3%	4.44
Law	16	1.50	6.01	5.8%	11.41
OEP	5	2.33	9.31	61.7%	6.62
Operations	925	2.18	8.70	21.9%	9.06
Pub. Affs.	14	2.11	8.46	15.8%	9.16
MWRA Avg	**1152**	**2.08**	**8.30**	**21.4%**	**8.99**

Percent of sick leave usage for FY17, attributable to Family and Medical Leave Act (FMLA) is 21.4% .



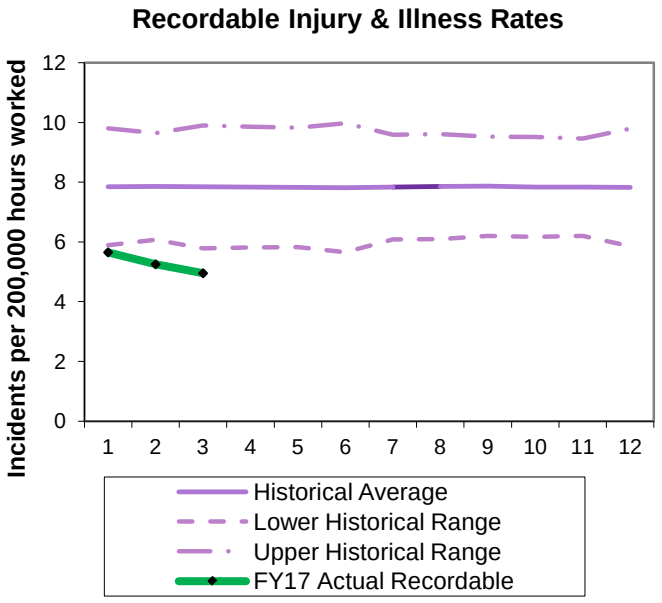
Total Overtime for Field Operations for the first quarter of FY17 was $610,967 which is ($69k) under budget. Emergency overtime was $256k, which was ($35k) **under** budget. Rain events totaled $175k, emergency maintenance was $62k, approximately $4k of which was for response to the Nut Island Fire. Coverage overtime was $161k, which was ($11k) under budget, reflecting the quarter's shift coverage requirements. Planned overtime was $194k or ($23k) under budget, mainly due to lower than expected activity related to the North Main Pump Station project. Spending for the quarter includes maintenance off-hours work at $99k, maintenance work completion at $30k, and planned operations at $10k.
YTD, FOD has spent $610,967 on overtime which is ($69k) under budget.

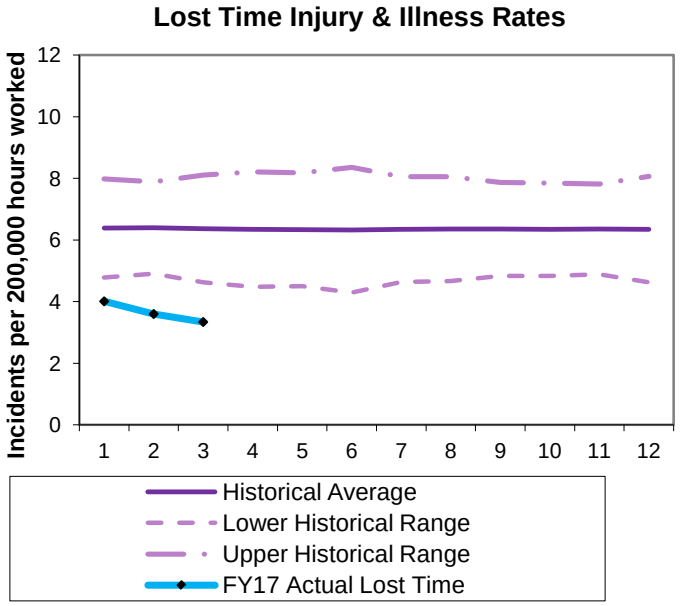


Total overtime for Deer Island for the first quarter of FY17 was $229,260, which is ($29k) under budget. No storm caverage requirements were needed in the first quarter, ($64k), is partially offset by a higher planned/unplanned overtime was $11k and higher than anticipated shift coverage, $24k mainly due to vacany operator positions.

Workplace Safety

First 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 Claims Highlights - 1st Quarter FY17

	New	Closed	Open Claims
Lost Time	2	2	58
Medical Only	4	4	13
Report Only	7		
	New	YTD Light Duty Returns	
Light Duty Returns	3		3

Highlights/Comments:

Light Duty Returns

Three employees returned to light duty from IA

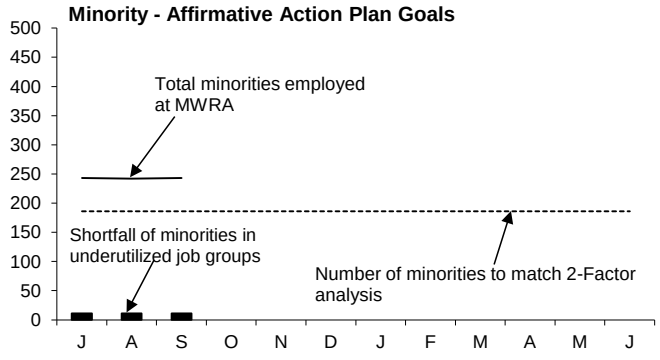
Regular Duty returns

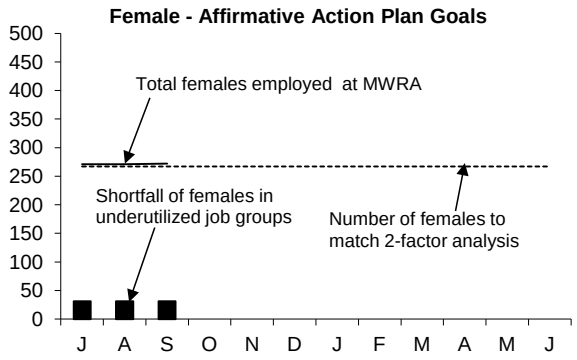
Note: Claims may initially be counted in one category and changed to another category at a later date. Examples include a medical treatment only claim (no lost time from work) but the employee may require surgery at a later date resulting in the claim becoming a lost time claim. At that time we would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

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

MWRA Job Group Representation

1st Quarter - FY17





Highlights:

At the end of Q1 FY17, 4 job groups or a total of 11 positions are underutilized by minorities as compared to 10 job groups or a total of 47 positions at the end of Q1 FY16; for females 8 job groups or a total of 31 positions are underutilized by females as compared to 11 job groups or a total of 43 positions at the end of Q1FY16. During Q1, 4 minority and 5 female were hired. During this same period 8 minorities and 6 female terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 9/30/2016	Minorities as of 9/30/2016	Achievement Level	Minority Over or Under Underutilized	Females As of 9/30/2016	Achievement Level	Female Over or Under Underutilized
Administrator A	21	2	2	0	7	6	1
Administrator B	22	1	3	-2	2	6	-4
Clerical A	39	15	5	10	34	35	-1
Clerical B	30	8	7	1	11	15	-4
Engineer A	82	20	14	6	14	12	2
Engineer B	58	16	11	5	12	7	5
Craft A	109	16	14	2	0	6	-6
Craft B	146	29	17	12	4	4	0
Laborer	72	19	16	3	4	3	1
Management A	99	14	16	-2	36	25	11
Management B	45	9	4	5	11	11	0
Operator A	66	4	10	-6	1	9	-8
Operator B	61	10	1	9	3	1	2
Professional A	33	5	5	0	22	13	9
Professional B	158	45	34	11	78	65	13
Para Professional	55	16	11	5	27	29	-2
Technical A	49	13	10	3	5	10	-5
Technical B	7	1	2	-1	1	2	-1
Total	**1152**	**243**	**182**	**72/-11**	**272**	**259**	**44/-31**

AACU Candidate Referrals for Underutilized Positions

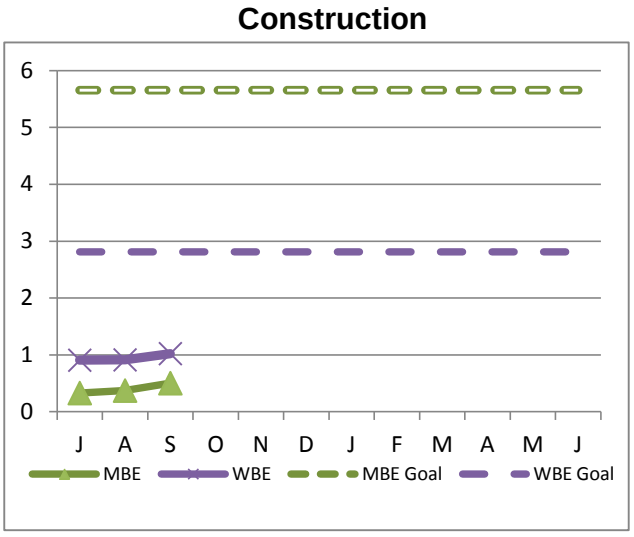
Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/ Transfers	AACU Ref. External	Position Status
Craft A	Unit Supervisor	1	Int	1	0	Promo = WM
Craft A	Unit Supervisor, Motor Equipment Repairmen	1	Int	1	0	Promo = WM
Craft A	M&O Specialist	2	Int/Ext	2	1	Promo=(2)WM
Craft A	Heavy Equipment Operator 1	1	Int/Ext	1	0	Transfer = WM
Craft A	General Foreman	1	Int/Ext	1	0	Promo = WM
Craft B	Electrician	1	Int/Ext	0	0	NH = WM
Clerical B	Junior Instrument Technician	1	Int/Ext	0	1	In Progress
Engineer B	Project Manager, SCADA	2	Int	2	0	Promo=(2)WM
Engineer B	Staff Engineer	1	Int/Ext	0	1	NH = WM
Laborers	OMC Laborer	1	Int/Ext	0	0	NH = WM
Laborers	Building & Grounds Worker	3	Int/Ext	0	1	NH = BM & (2) WM
Management A	Senior Manager, Coordination & Control	1	Int	1	0	Promo = WF
Management A	Purchasing Manager	1	Int	1	0	Promo = WM
Management A	Construction Coordinator	1	Int/Ext	0	0	NH = WM
Management B	Area Manager	1	Int	1	0	Promo = WM
Professional B	Security Services Adminstrator	1	Int/Ext	0	1	In Progress
Professional B	Chemist I	1	Int	1	0	Transfer = WF
ParaProfessional	Administrative Systems Coordinator	1	Int	1	0	Transfer = WF
Technical A	Systems Administrator III	1	Int	1	0	Promo = BM
Technical A	Communication and Control Technician	2	Int/Ext	1	0	NH = WF & WM
Technical A	Sr.Field Service Technician	1	Int/Ext	0	2	NH = WM

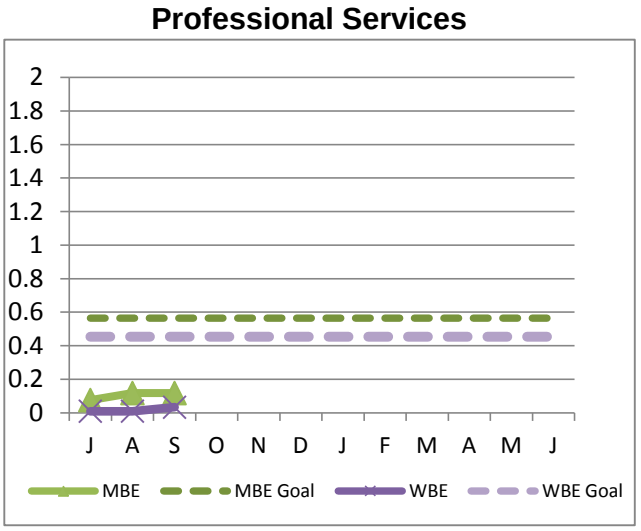
MBE/WBE Expenditures

1st 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 September.





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

MBE					WBE			
FY17 YTD		FY16			FY17 YTD		FY16	
Amount	Percent	Amount	Percent		Amount	Percent	Amount	Percent
502,903	8.9%	1,805,604	37.9%	Construction	1,021,956	36.3%	1,114,916	47.1%
117,661	20.8%	828,841	55.3%	Prof. Svcs	32,930	7.2%	314,752	26.1%
42,712	7.1%	255,324	40.6%	Goods.Svcs	411,267	48.1%	1,124,374	160.7%
663,276	9.7%	2,889,769	41.9%	**Totals**	1,466,153	35.6%	2,554,042	59.8%

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

FY17 CEB Expenses
1st Quarter FY17

	September 2016 Year-to-Date					
	Period 3 YTD Budget	Period 3 YTD Actual	Period 3 YTD Variance	%	FY17 Approved	% Expended
EXPENSES						
WAGES AND SALARIES	$ 22,026,185	$ 21,739,199	$ (286,986)	-1.3%	$ 101,588,897	21.4%
OVERTIME	1,021,966	914,231	(107,735)	-10.5%	4,192,676	21.8%
FRINGE BENEFITS	5,002,091	4,573,719	(428,372)	-8.6%	20,242,323	22.6%
WORKERS' COMPENSATION	586,048	108,277	(477,771)	-81.5%	2,344,190	4.6%
CHEMICALS	2,652,427	2,841,517	189,090	7.1%	9,110,407	31.2%
ENERGY AND UTILITIES	4,389,287	4,598,064	208,777	4.8%	21,541,077	21.3%
MAINTENANCE	6,754,180	7,934,632	1,180,452	17.5%	31,080,642	25.5%
TRAINING AND MEETINGS	65,990	103,736	37,746	57.2%	435,481	23.8%
PROFESSIONAL SERVICES	1,484,364	1,456,676	(27,688)	-1.9%	6,531,939	22.3%
OTHER MATERIALS	822,308	993,751	171,443	20.8%	6,219,630	16.0%
OTHER SERVICES	6,118,260	5,603,209	(515,051)	-8.4%	22,974,855	24.4%
TOTAL DIRECT EXPENSES	**$ 50,923,106**	**$ 50,867,011**	**$ (56,093)**	**-0.1%**	**$ 226,262,117**	**22.5%**
INSURANCE	$ 499,474	$ 427,968	$ (71,506)	-14.3%	$ 1,997,898	21.4%
WATERSHED/PILOT	6,072,817	6,017,497	(55,320)	-0.9%	24,291,268	24.8%
BECo PAYMENT	193,465	194,994	1,529	0.8%	773,859	25.2%
MITIGATION	389,500	385,700	(3,800)	-1.0%	1,558,000	24.8%
ADDITIONS TO RESERVES	(41,936)	(41,936)	-	0.0%	(167,742)	25.0%
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	**$ 11,745,944**	**$ 11,616,847**	**$ (129,097)**	**-1.1%**	**$ 37,961,957**	**30.6%**
STATE REVOLVING FUND	$ 19,880,426	$ 19,880,426	$ -	0.0%	$ 86,971,915	22.9%
SENIOR DEBT	65,712,028	65,493,958	(218,070)	-0.3%	268,472,556	24.4%
CORD FUND	-	-	-	---	-	---
DEBT SERVICE ASSISTANCE	-	-	-	---	(873,804)	---
CURRENT REVENUE/CAPITAL	3,050,000	3,050,000	-	0.0%	12,200,000	25.0%
SUBORDINATE MWRA DEBT	13,704,926	13,704,926	-	0.0%	69,997,992	19.6%
LOCAL WATER PIPELINE CP	1,037,310	1,037,310	-	0.0%	4,149,242	25.0%
CAPITAL LEASE	804,265	804,265	-	0.0%	3,217,060	25.0%
DEBT PREPAYMENT	-	-	-	---	10,994,960	0.0%
VARIABLE DEBT	-	(2,768,995)	(2,768,995)	---	-	0.0%
DEFEASANCE ACCOUNT	-	-	-	---	-	---
TOTAL DEBT SERVICE	**$ 104,188,956**	**$ 101,201,891**	**$ (2,987,065)**	**-2.9%**	**$ 455,129,921**	**22.2%**
TOTAL EXPENSES	**$ 166,858,006**	**$ 163,685,749**	**$ (3,172,256)**	**-1.9%**	**$ 719,353,995**	**22.8%**
REVENUE & INCOME						
RATE REVENUE	$ 173,719,625	$ 173,719,625	$ -	0.0%	$ 694,878,500	25.0%
OTHER USER CHARGES	2,271,527	2,260,982	(10,545)	-0.5%	8,752,834	25.8%
OTHER REVENUE	979,548	1,051,829	72,281	7.4%	6,519,171	16.1%
RATE STABILIZATION	-	-	-	---	-	---
INVESTMENT INCOME	2,196,173	1,959,620	(236,553)	-10.8%	9,473,490	20.7%
TOTAL REVENUE & INCOME	**$ 179,166,873**	**$ 178,992,056**	**$ (174,817)**	**-0.1%**	**$ 719,623,995**	**24.9%**

As of September 2016, total expenses are $163.7 million, $3.2 million or 1.9% lower than budget and total revenue was $179.0 million, $175k or 0.1% below budget, for a net variance of $3.0 million.

Expenses –

Direct Expenses are $50.9 million, $56k or 0.1% below budget.

- **Wages & Salaries** are under budget by $287k or 1.3%. At the end of September, the average Full Time Equivalent (FTE) positions were 1,136, 14 positions fewer than the 1,150 budgeted FTE's.
- **Maintenance** is over budget by $1.2 million or 17.5%. Services are overspent by $880k and Materials are overspent by $301k. Over spending includes $397k for Nut Island fire repairs and the remaining variance reflecting other work completed ahead of schedule.
- **Other Services** are under budget by $515k or 8.4% mainly due to lower Sludge Pelletization expense of $248k reflecting lower year to date quantities, lower membership and dues of $92k due to timing, and lower Grit Screenings Removal $91k reflecting lower than budgeted quantities.
- **Workers' Compensation** is underspent by $478k or 81.5% due to lower than budgeted Medical Payments of $246k and Compensation Payments of $240k, due mostly to reserve adjustments.
- **Fringe Benefits** are under budget by $428k or 8.6% mainly due to one week under accrual and lower than budgeted FTE's.
- **Utilities** are over budget by $209k or 4.8% mainly due to electricity purchases $221k over budget reflecting an over accrual at Deer Island.
- **Chemicals** are overspent by $189k or 7.1% mainly due to higher spending on Sodium Hypochlorite of $91k due to timing at Deer Island and higher contract prices at the Carroll and Brutsch water treatment facilities, Hydrogen Peroxide of $82k due to increased need for pretreatment of hydrogen sulfide gas due to lower flows at Deer Island, and Activated Carbon of $36k.
- **Other Materials** are over budget by $171k or 20.8% mainly due to vehicle purchase of $131k, Other Materials of $54k, and Computer Hardware of $52k, partially offset by lower Vehicle Expenses of $87k reflecting lower gasoline pricing.

Indirect Expenses of $11.6 million, 129k under budget or 1.1%.

Debt Service Expenses totaled $101.2 million, which was $3.0 million or 2.9% under budget due mainly to lower than budgeted variable rate interest of $2.8 million and savings from the August 2016 refunding.

Revenue and Income –

Total Revenue / Income for September is $179.0 million, $175k or 0.1% under budget mainly due to lower investment Income of $237k due to unexpected calls and lower reinvestment rates.

Cost of Debt
1st 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.

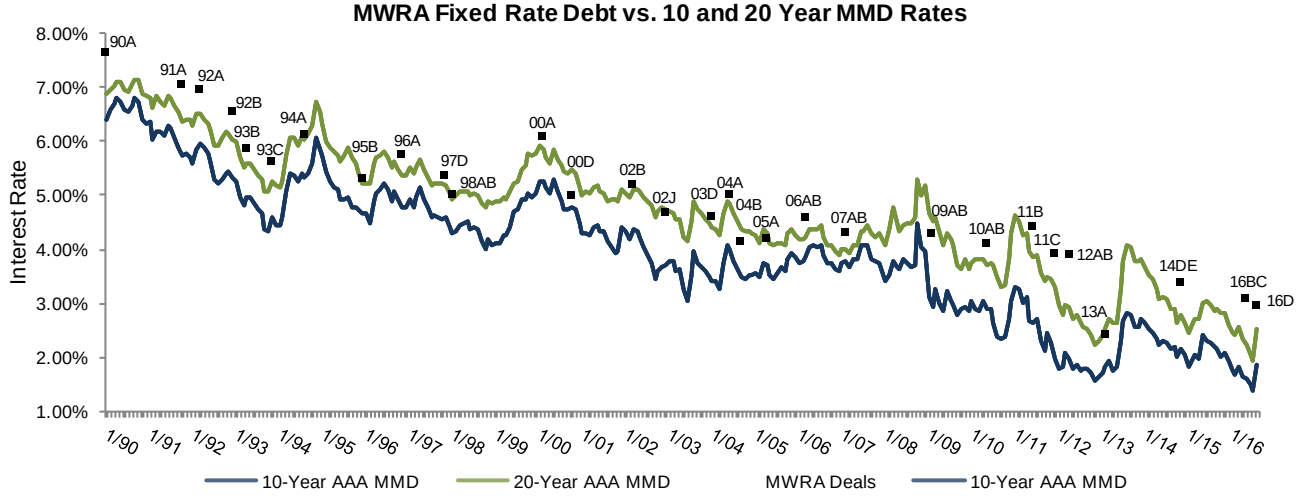
Average Cost of MWRA Debt

Fixed Debt ($3,621)	3.95%
Variable Debt ($481.2)	0.93%
SRF Debt ($980.1)	1.38%
Weighted Average Debt Cost ($5,083)	3.17%

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

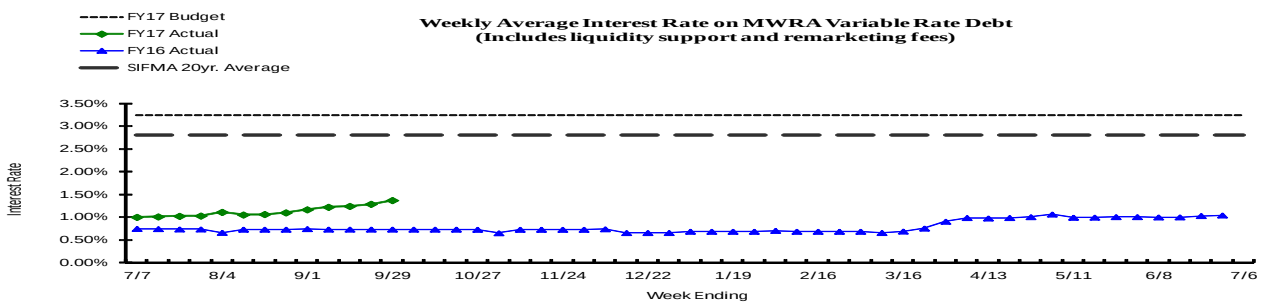


Bond Deal	1992A	1992B	1993B	1993C	1994A	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D
Rate	6.98%	6.58%	5.89%	5.66%	6.15%	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%
Avg Life	22.6 yrs	6.3 yrs	19.8 yrs	19.1 yrs	19.5 yrs	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6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

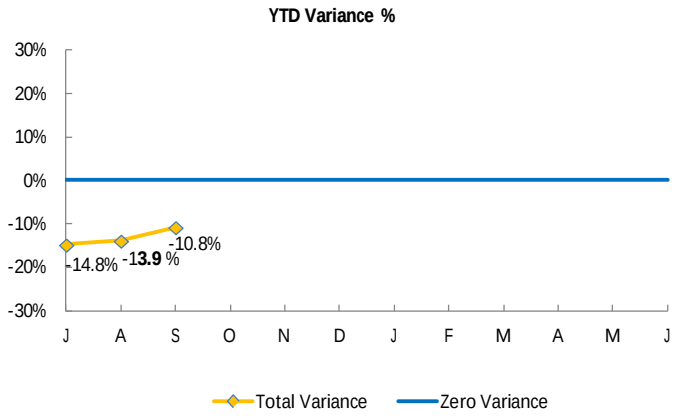
MWRA currently has eleven variable rate debt issues with $903 million outstanding, excluding commercial paper. Of the eleven outstanding series, five have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In September, SIFMA rates ranged from a high of 0.78% to a low of 0.63% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate risk as compared to fixed rate debt.



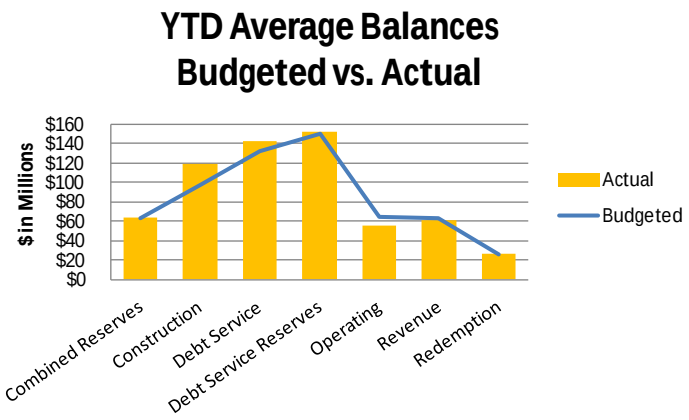
Investment Income

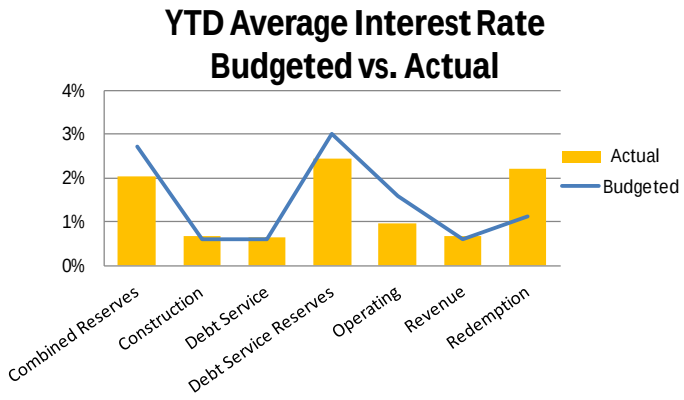
1st Quarter – FY17

Year To Date



	YTD BUDGET VARIANCE ($000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	($0)	($100)	(100)	-24.6%
Construction	$30	$21	50	36.3%
Debt Service	$15	$21	35	18.9%
Debt Service Reserves	$3	($189)	(185)	-17.4%
Operating	($32)	($81)	(113)	-46.7%
Revenue	($4)	$12	8	9.4%
Redemption	$0	$68	68	96.4%
Total Variance	$12	($248)	($237)	-10.8%





Monthly