

MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

First Quarter FY2022

Q1	Q2	Q3	Q4



Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
November 17, 2021

Board of Directors Report on Key Indicators of MWRA Performance

1st Quarter - FY22

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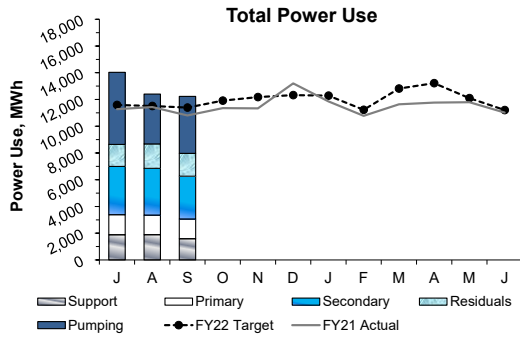
This quarterly report is prepared by MWRA staff to track a variety of MWRA performance measures for routine review by MWRA's board of directors. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for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

Frederick A. Laskey, Executive Director
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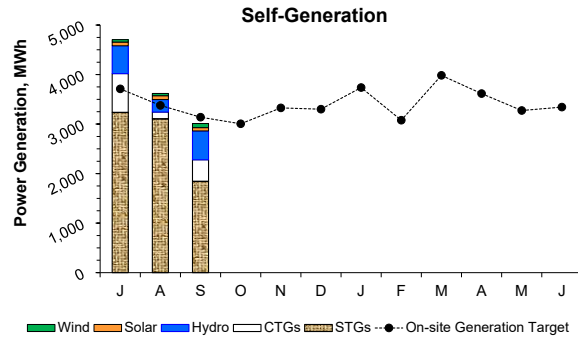
OPERATIONS AND MAINTENANCE

Deer Island Operations

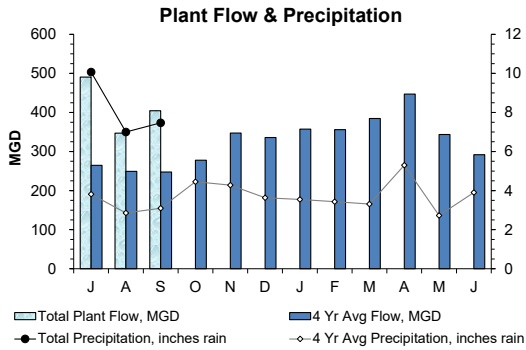
1st Quarter - FY22



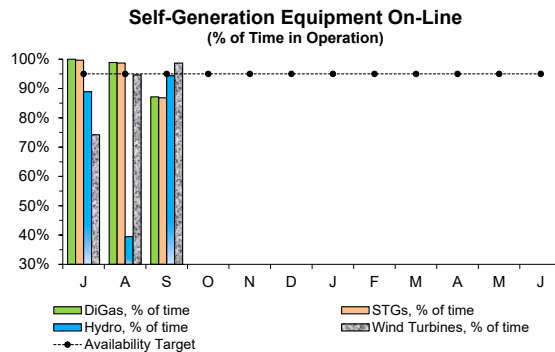
Total power usage in the 1st Quarter was 13.5% above target as plant flow for this period was 63.1% higher than target with historical data (4 year average) used to generate the electricity model. September rainfall, combined with the fourth highest summer rainfall on record for June, July, and August, resulted in continued sustained high plant flows. As a result, power used for raw wastewater pumping was 63.2% above target, with 56.4% higher power usage for pumping the North System flows and 86.5% higher usage for pumping the South System flows. Power usage for most of the other treatment processes were similar to below target during the 1st Quarter.



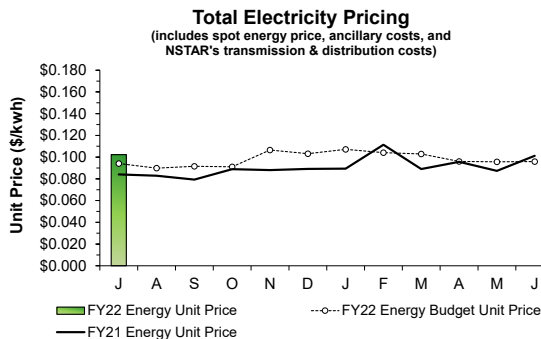
Power generated on-site during the 1st Quarter was 10.8% above target. CTG generation was above target by 85.6% as the units were operated in parallel with utility power during several storms with heavy rains and wind in July and September, to prevent service disruptions (during high potential periods for power outages). Additionally, the CTGs were operated for Eversource Demand Response Events, peak shaving, and for testing purposes. STGs generation was on target (+0.4%). Hydro Turbine generation was 65.8% above target due to a budget estimate that was biased low along with higher-than-expected plant flows. Wind Turbine generation was 20.6% below target due to an electrical issue with Turbine #2 which required the turbine to be out of service for 15 days in July. Additionally, Wind Turbine generation was impacted by scheduled maintenance, and by occasionally turbulent wind conditions this quarter. Generation from the Solar Panels was 21.5% below target due to extended periods of rain and overcast days.



Total Plant Flow for the 1st Quarter was 63.1% higher than target with the budgeted 4 year average plant flow (414.0 MGD actual vs. 253.9 MGD expected) as precipitation was more than 2.5 times above target (24.54 inches actual vs. 9.77 inches expected).

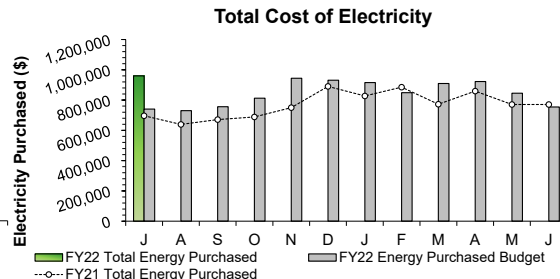


The availability of the DiGas system and the STGs met their 95% availability target during the 1st Quarter, while Wind Turbine and Hydro Turbine availability fell below target. Wind Turbine availability was 89.2% due to electrical issues with Turbine #2 that prevented operation during the first half of July. Hydro Turbine availability was 74.2% due to scheduled annual maintenance on Turbine #1, which required the turbine to be out of service for 17 days in August, and Turbine #2 remains out of service pending repair of the runner blade assembly. Additionally, the available turbine is unable to operate during elevated plant flow periods which occurred multiple times during the quarter due to rain.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Price in July (the most current invoice available) was 8.7% above target with budgetary estimates. The actual Total Energy Unit Prices in August and September are not yet available as the complete invoices have not been received. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

Note: Only the actual energy prices are reported. Therefore, the dataset lags by two (2) month due to the timing of invoice receipt and review.



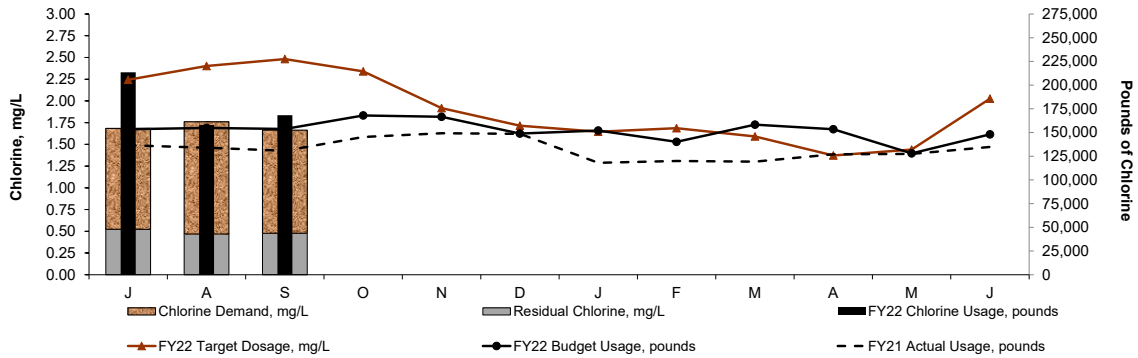
The Electricity cost data for Electricity Purchased for August and September are not yet available as the complete invoices have not been received. Year-to-date Total Cost of Electricity is \$219,085 (29.6%) higher than budgeted through July as the Total Energy Unit Price was 8.7% higher than target and the Total Electricity Purchased was 19.2% above target.

Note: Only months with complete Electricity Purchased data are reported. Therefore, the dataset lags by two (2) month due to the timing of invoice receipt and review.

Deer Island Operations

1st Quarter - FY22

Deer Island Sodium Hypochlorite Use



The disinfection dosing rate in the 1st Quarter was 28% below target with budgetary estimates. However, actual sodium hypochlorite usage in pounds of chlorine was 16.8% higher-than-expected as the average plant flow was 63.1% higher-than-expected. DITP maintained an average disinfection chlorine residual of 0.49 mg/L this quarter with an average dosing rate of 1.70 mg/L (as chlorine demand was 1.21 mg/L).

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	7	7	0	95.1%	84.65
A	6	6	0	99.0%	17.42
S	2	2	0	96.4%	35.02
O					
N					
D					
J					
F					
M					
A					
M					
J					
Total	15	15	0	96.6%	137.08

96.6% of all flows were treated at full secondary during the 1st Quarter. There were fifteen (15) secondary blending events due to high plant flows from heavy rain. These blending events resulted in 137.08 hours of blending and a total of 1,294.46 MGal of primary-only treated effluent with secondary effluent. The Maximum Secondary Capacity during the entire quarter was 700 MGD. Secondary permit limits were met at all times during the 1st Quarter of FY22.

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved an instantaneous peak flow rate of 1,317.78 MGD in the 1st Quarter during the late morning on September 2. This peak flow occurred during a storm event that brought 4.23 inches of precipitation to the metropolitan Boston area. Overall, Total Plant Flow in the 1st Quarter was 63.1% above target with the 4 year average plant flow estimate for the quarter.

New records for the months of July and September, dating back to plant startup in July 1998, were set during the 1st Quarter as rainfall in the Boston area was more than 2.5 times higher-than-expected. The daily average plant flow for the North System influent flow, South System influent flow, and Total Plant influent flow all shattered the previous records for these two (2) months, as well as the precipitation record for July (see tables below).

	Previous July Records (since plant startup July 1998)	New July Records (set 2021)
Total Plant Influent Flow	384.87 MGD (2009)	490.58 MGD
North System Influent Flow	253.98 MGD (2009)	313.54 MGD
South System Influent Flow	142.24 MGD (1998)	177.05 MGD
Precipitation	6.9 inches (2009)	10.07 inches

	Previous September Records (since plant startup July 1998)	New September Records (set 2021)
Total Plant Influent Flow	366.46 MGD (2011)	404.41 MGD
North System Influent Flow	249.10 MGD (1999)	269.49 MGD
South System Influent Flow	123.74 MGD (2011)	134.92 MGD
Precipitation	9.86 inches (1999)	No new record set (7.47 inches)

Deer Island Operations

1st Quarter - FY22

Deer Island Operations & Maintenance Report (continued)

Secondary Treatment:

Inspection and routine preventative maintenance of DITP's two (2) flow control gates and appurtenances are currently conducted on a 10 year cycle. The flow control gates control the amount of primary-only treated flow that bypasses the secondary treatment process. These gate inspections are critical to ensure the proper operation of these flow control gates thus preventing unanticipated bypass events. The gate inspections require the area upstream and downstream of the gate to be isolated and drained of water and the inspections can only be conducted on a single gate at a time on separately spaced days due to the effort and length of time required to prepare the site, in addition to the time needed to conduct the inspection and to perform the preventative maintenance. The inspections were conducted during dry weather conditions on August 4 for flow control gate #1 and on August 25 for flow control gate #2. The final inspection reports are pending receipt from the contractor. The regulators (DEP and EPA) were provided with notifications in advance of these inspections.

Residuals Treatment:

On January 26, staff isolated Digested Sludge and Gas Storage (Dystor) Tank #1 from the second Dystor tank to empty the sludge and settled material from the tank. The Gravity Thickener Rehabilitation contract included a task to drain and clean Dystor Tank #1. In addition to material removal, piping and valves were also replaced as part of the project. A nitrogen purge of the Dystor #1 headspace was successfully completed by staff on August 26. A nitrogen purge is performed at this stage for safety reasons before placing the tank back on the digester gas system to ensure there is no oxygen remaining in the headspace that would mix with the methane once the tank is reconnected to the gas system thus avoiding explosive conditions. On August 31, the tank was returned to service and began receiving digested sludge.

Energy and Thermal Power Plant:

Overall, total power generated on-site accounted for 29.0% of Deer Island's total power use for the 1st Quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 25.5% of Deer Island's total electrical power use for the quarter.

Wind Turbine #2, which had been out of service since May 29 with several electrical issues was returned to service on July 16 after the required OEM parts were received, some from overseas, and the repairs were able to be completed.

On August 2, Hydro Turbine #1 was taken offline for annual maintenance. The turbine was returned to service on August 20 following work and testing on both electrical and mechanical components of the turbine.

On August 26, while placing the second boiler into operation for the annual compliance emissions Relative Accuracy Test Audit (RATA), staff identified a significant leak through the valve stem of the main steam stop valve. The valve is common to the entire steam system requiring both boilers to be taken out of service in order to repair the leak which was able to be completed by the end of the day. The RATA test, which is conducted by a contractor and must be completed on each boiler, was rescheduled and successfully completed on September 10 for boiler 101 and on September 22 for boiler 201. The RATA compares data from the boiler's Continuous Emissions Monitor Systems (CEMS) to a simultaneously collected reference method test data in order to assess the accuracy of the CEMS readings.

Annual maintenance at the Thermal Power Plant (TPP) began on September 5 and continued through September 15. Various maintenance activities on the BP-STG and the two (2) Zurn boilers included maintenance on various pumps, valves, and instrumentation throughout the power plant. Due to staffing issues, annual maintenance on the main STG was delayed and will be completed in the future. On September 12, Boiler 101 and both the STG and the BP-STG were taken out of service for common steam system maintenance. This annual maintenance was completed on September 15 and Boiler 201, along with the BP-STG, were immediately returned to operation during the overnight hours. The main STG was returned to operation on September 16. Boiler 101 was returned to backup standby mode.

Regulatory

Representatives from the MA DEP were onsite at DITP on September 1 for a scheduled DITP Air Operating Permit Inspection which is typically conducted every five years. They were given a comprehensive tour and review of the Thermal Power Plant and the West Odor Control Facility, and were provided with data, records, and documents per their requests. Initial communications indicate the inspection had gone well and no issues were raised by the MA DEP. The previous onsite audit was conducted in June 2017.

Clinton Operations & Maintenance Report

Dewatering Building

Operation staff washed down and dewatered gravity thickener # 2. They also replaced bent scum skimmer on gravity thickener # Contractor moved valves into position for installation. Maintenance staff replaced wash box seals on belt filter press # 1. Contractor wired new lower water cutout that was recently installed in the dewatering building boiler. Maintenance staff replaced pinion gear on belt filter press # 1. They also worked on belt filter press sludge hopper.

Chemical Building

Maintenance staff cleaned the 4 inch discharge pipe, suction header and jetted "B" feed line on soda ash system. Deer Island staff repaired controls on # 1 and # 3 Hypochlorite pumps. Operations switched from #1 polymer pump to # 2 pump so maintenance and cleaning can be done on # 1 pump. Contractor repaired copper feed water piping to polymer pumps.

Aeration Basins

Operations staff cleaned pH and DO probes. Maintenance staff replaced Aerzen blower # 4B. They also completed oil changes on 6A and 6B blowers and changed drive belts on #2. Deer Island staff replaced a flow meter on #6 aeration blower piping.

Phosphorus Building

Maintenance staff replaced the feed pump to the phosphorus analyzer. Maintenance also acid washed all three disk filters, cleaned troughs, and inspected all nozzles. Operation staff cleaned both CL17 chlorine analyzers.

Headworks

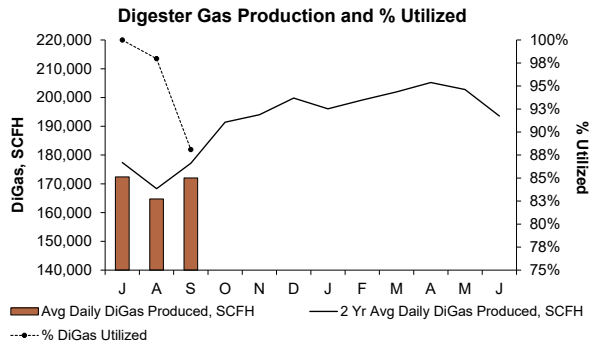
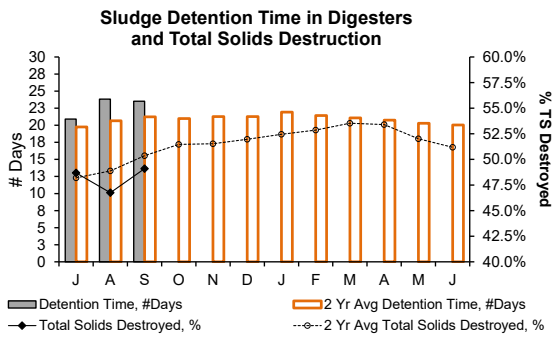
Maintenance staff cleaned manual and mechanical bar rack. Staff installed a new suction tube line in the influent samplers. Contractor installed new hot water tank in primary pump station. Contractor fixed leaking condensate pipes in headwork's boiler room.

Digester Building

Maintenance staff checked all equipment for proper operation and greased Ovivo mixer on floating cover. Facilities specialist worked on repairing the concrete stair platform.

Deer Island Operations and Residuals

1st Quarter - FY22



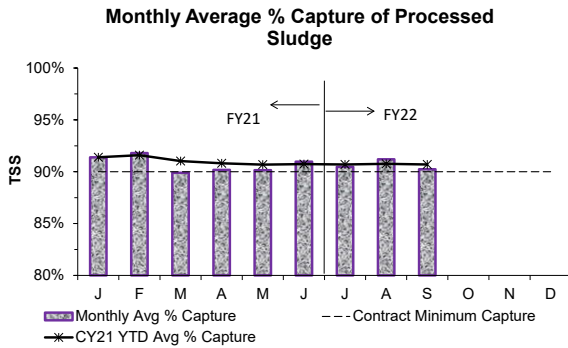
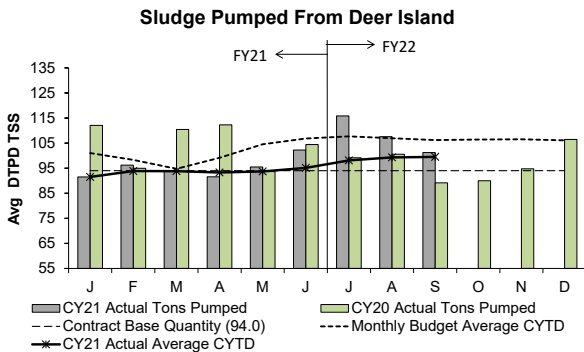
Total solids (TS) destruction following anaerobic sludge digestion averaged 48.2% during the 1st Quarter, within 2.0% of the 2 year average of 49.6%. Sludge detention time in the digesters was 22.8 days, 10.8% above target. Sludge detention time was higher-than-target as all eight (8) digesters were in operation in comparison to the 6 year average of 7.7 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 significantly impacted by changes in the number of digesters and the resulting shifting around of sludge.

The Avg Daily DiGas Production in the 1st Quarter was similar (-2.6%) to the 6 Year Avg Daily DiGas Production. Only 95.4% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant (TPP) due to a leaking steam valve that required both boilers to be taken out of operation to allow for the valve repair, a digester gas compressor issue that reduced the amount of digester gas that was able to be delivered to the Thermal Power Plant for several days, and the annual Thermal Power Plant shutdown (September 12 to Sept) for boiler and common system maintenance.

Residuals Pellet Plant

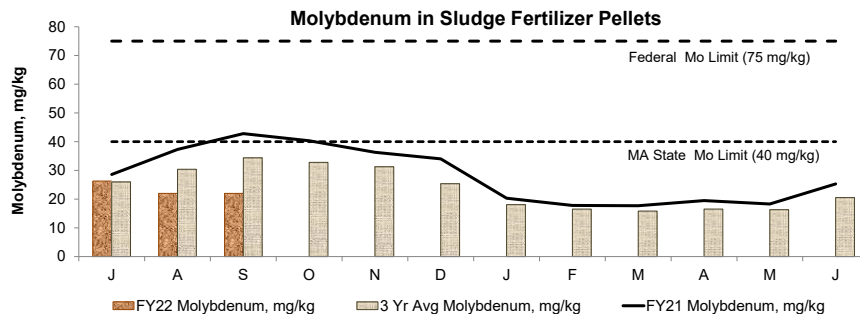
New England Fertilizer Company (NEFCO) operates the MWRA Biosolids Processing Facility (BPF) in Quincy under contract. MWRA pays a fixed monthly amount for the calendar year to process up to 94.0 DTPD/TSS as an annual average (for the extended contract period of January 1, 2021 through December 31, 2022). The monthly invoice is based on 94.0 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. On average, MWRA processes more than 94.0 DTPD/TSS each year (FY21's budget is 107.9 DTPD/TSS and FY22's budget is 106.2 DTPD/TSS).



The average quantity of sludge pumped to the Biosolids Processing Facility (BPF) in the 1st Quarter was 108.2 TSS Dry Tons Per Day (DTPD) - 3.1% above target with the FY21 budget of 105.0 TSS DTPD for the same period.

The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 1st Quarter was 90.64% and the CY21-to-date average capture was 90.70%.

The CY21 average quantity of sludge pumped through September is 99.5 DTPD - 6.3% below target compared with the CY21-to-date average budget of 106.2 DTPD during the same time period.



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

Overall, the levels have been below the DEP Type 1 limit for all three (3) metals. For Mo, the level in the MWRA sludge fertilizer pellets during the 1st Quarter averaged 23.4 mg/kg, 23% above the 3 year average, 41% below the MA State Limit, and 69% below the Federal Limit.

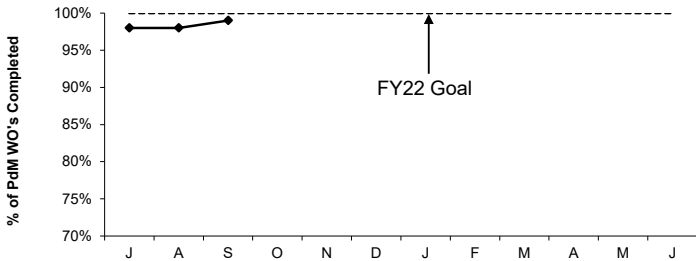
Deer Island Maintenance

1st Quarter - FY22

Productivity Initiatives

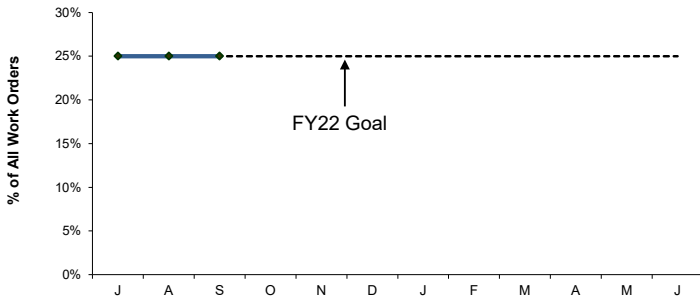
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.

Predictive Maintenance Compliance



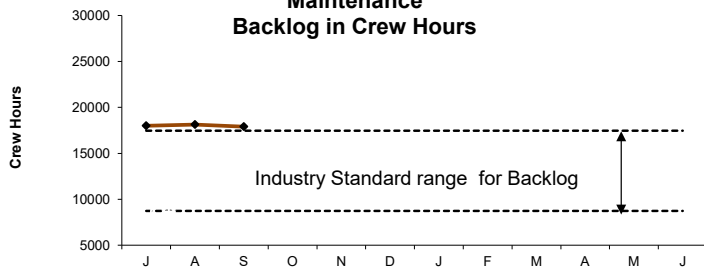
Deer Island's FY22 predictive maintenance goal is 100%. DITP completed 98% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program. Deer Island is below goal this quarter, but we are trending upward.

Predictive Maintenance



Deer Island's increased FY22 predictive maintenance goal is 25% of all work orders to be predictive. 25% 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

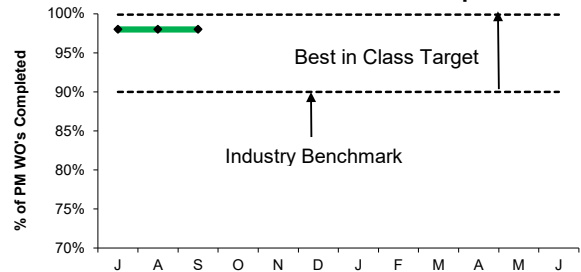


DITP's maintenance backlog at Deer Island is 17,900 hours this quarter. DITP is above the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by six vacancies; (2) HVAC Tech (3) Electricians, and (1) I&C Tech. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

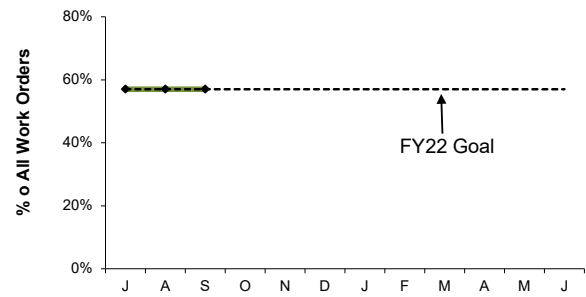
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.

Preventative Maintenance Compliance



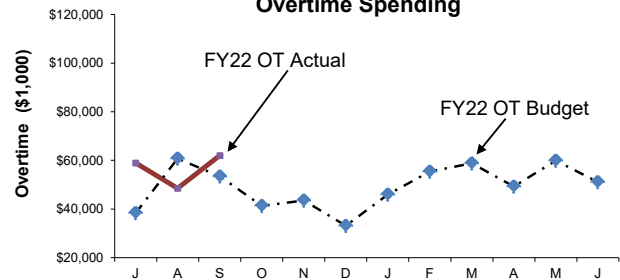
Deer Island's FY22 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 98% of all PM work orders this quarter. Deer Island was below our goal, but within Best in Class Target.

Maintenance Kitting



Deer Island's increased FY22 maintenance kitting goal is 57% of all work orders to be kitted. 57% of all work orders were kitted this quarter. Kitting is staging of parts or material necessary to complete maintenance work. This has resulted in more wrench time and increased productivity.

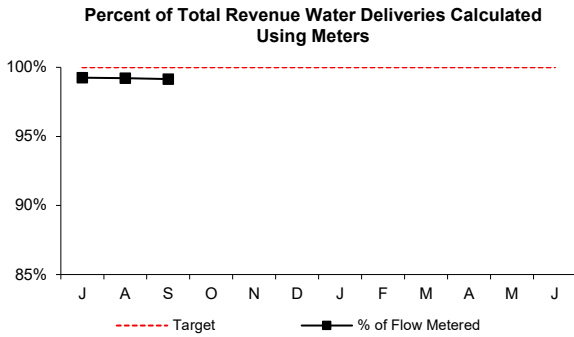
Overtime Spending



Maintenance overtime was over budget by \$17K this quarter and \$17k over for the year. Management continues to monitor backlog and to ensure all critical equipment and systems are available. This quarter's overtime was predominately used for Storm Coverage/High Flows, Pump Clogging Issues, North Main Pump Multi-Stack Chiller, Perimeter Road Dewatering Line and Repair of Winthrop Terminal Facility RWW Pump #5.

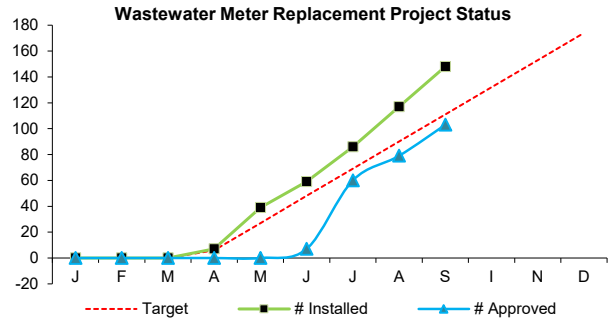
Operations Division Metering & Reliability 1st Quarter - FY22

WATER METERS



The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During Q1 FY22, 0.79% of the billed water flow was estimated. 99.21% was based on meter actuals. A total of 2.44% of the total flow was measured using annubar meters, mostly due to bypass valves opened to increase the available flow to Burlington. An additional 1% was billed through a temporary bypass meter at the Edgell Rd Pump station in Framingham and a temporary bypass setup at Meter 152 in Arlington.

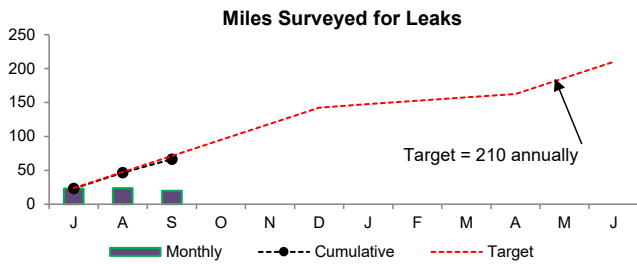
WASTEWATER METERS



The Wastewater Meter Replacement Project was approved at the October 2020 Executive Board meeting. The first installations were performed in the final week of April. Through Q1 FY22 the contractor has installed 148 meters and performed final confirmations on 103 meters out of a total of 174. The table above tracks the # of installed and confirmed meters over the course of the project. The contract requires completion of installations in CY2021.

While the meters are being replaced, communities will be assessed based on a monthly average volume from the previous 3 calendar years.

WATER DISTRIBUTION SYSTEM PIPELINES



During the 1st Quarter of FY22, 66.34 miles of water mains were inspected. The total inspected for the fiscal year to date is 66.34.

Leak Backlog Summary													
Month	J	A	S	O	N	D	J	F	M	A	M	J	Totals
Leaks Detected	2	2	0										4
Leaks Repaired	0	2	1										3
Backlog	5	5	4										n/a

During the 1st Quarter of FY22 four leaks were detected, and three were repaired. Refer to FY22 Leak Report below for details. Also, community service ranging from individual leak location to hydrant surveys were conducted for Boston, Brookline, Lexington, Lynn, Marlborough, Medford, Melrose, Newton, Revere, Saugus and Somerville.

1st Quarter - Leak Report FY22

Date Detected	Location of Leaks	Repaired
07/01/21	Fellsway West @ Fells Ave., Medford	08/26/21
08/08/21	Fellsway East @ Pond St., Stoneham	08/18/21
07/28/21	Western Ave. @ WHDH Radio Station-Saugus	09/13/21

Date Detected	Location of Leaks/Unrepaired
07/01/16	241 Forest St. Winchester, Sect 89, leakig blow off valve. No surfacing. Need redundant NIH pipeline to enable isolation.
12/04/16	710 Ashland St/Summer St. Lynn, Sect 91. Not surfacing Leaking emergency connection valve btw MWRA & LWSC systems. LWSC has difficulty isolating 16" main.
08/27/20	Hyde Park Ave. @ River St., Hyde Park. BWSC is in process of isolating their water main first.
08/27/21	Middlesex Fells/Wellington, Medford

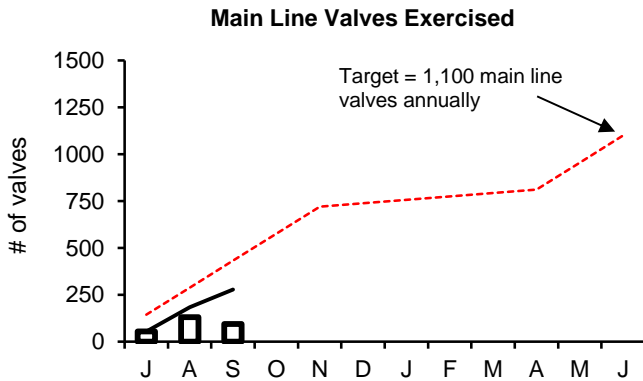
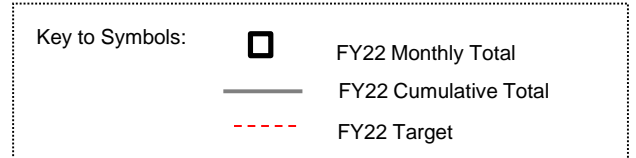
Water Distribution System Valves

1st Quarter - FY22

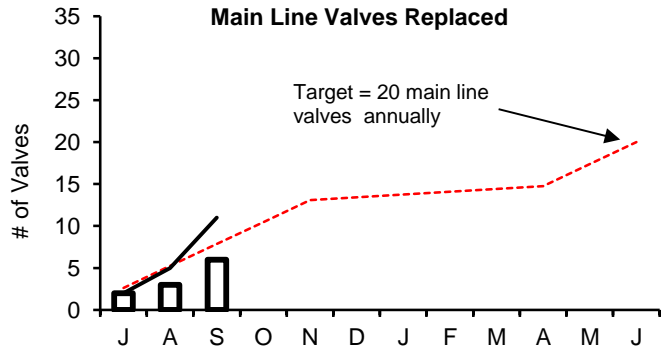
Background

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.

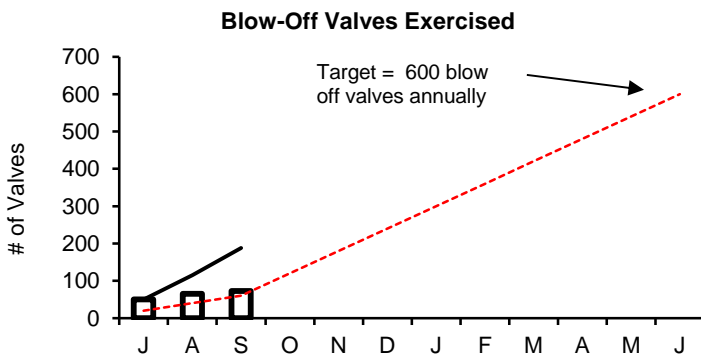
Type of Valve	Inventory #	Operable Percentage	
		FY22 to Date	FY22 Targets
Main Line Valves	2,159	97.0%	95%
Blow-Off Valves	1,317	98.6%	95%
Air Release Valves	1,380	95.5%	95%
Control Valves	49	100.0%	95%



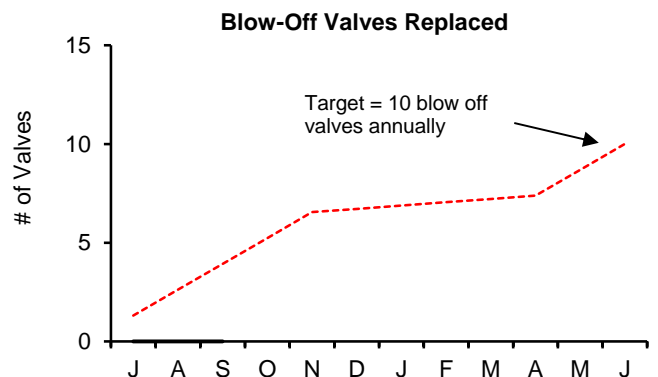
During the 1st Quarter of FY22, 278 main line valves were exercised. The total exercised for the fiscal year to date is 278.



During the 1st Quarter of FY22, there were eleven main line valves replaced. The total replaced for the fiscal year to date is eleven.



During the 1st Quarter of FY22, 188 blow off valves were exercised. The total exercised for the fiscal year to date is 188.



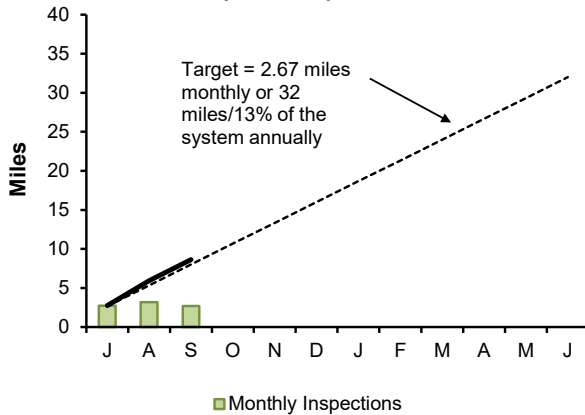
During the 1st Quarter of FY22, there were no blow off valves replaced. The total replaced for the fiscal year to date is zero. Below target due to isolation & permit issues and staff vacancies.

Wastewater Pipeline and Structure Inspections and Maintenance

1st Quarter - FY22

Inspections

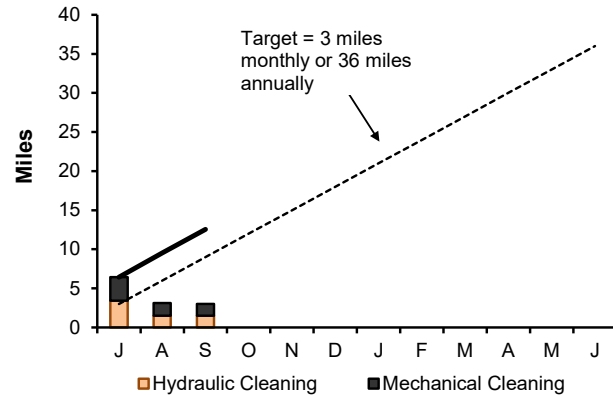
Pipeline Inspections



Staff internally inspected 8.63 miles of MWRA sewer pipe during this quarter. The year to date total is 8.63 miles. No Community Assistance was provided.

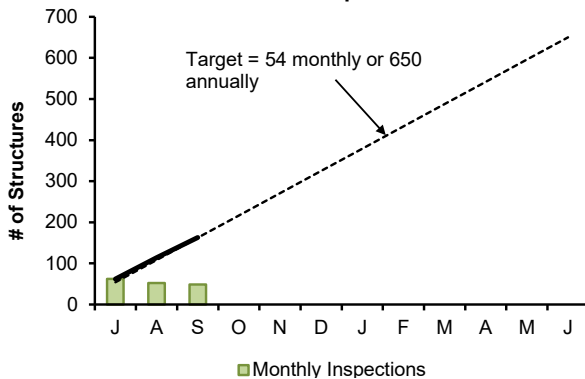
Maintenance

Pipeline Cleaning



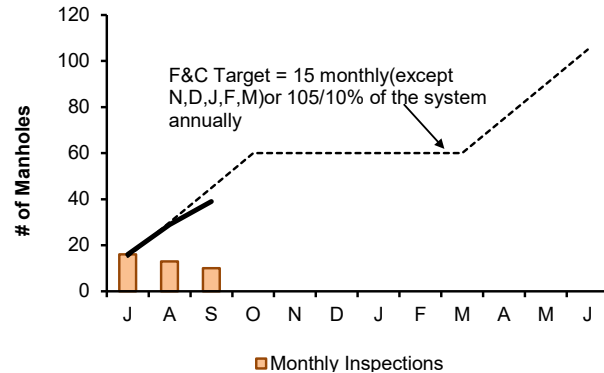
Staff cleaned 12.55 miles of MWRA sewer pipe, and removed 57 yards of grit. The year to date total is 12.55 miles. No Community Assistance was provided.

Structure Inspections



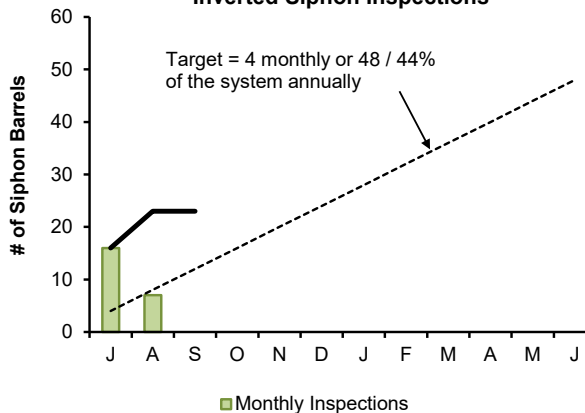
Staff inspected the 36 CSO structures and performed 127 other additional manhole/structure inspections during this quarter. The year to date total is 163 inspections.

Manhole Rehabilitation



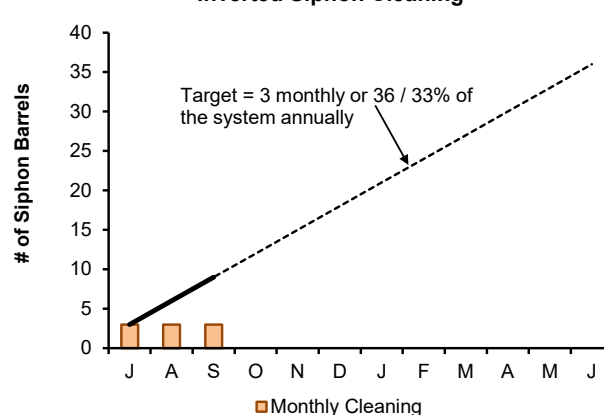
Staff replaced 39 frame and cover replacements this quarter. The year to date total is 39.

Inverted Siphon Inspections



Staff inspected 23 siphon barrels this quarter. The year total is 23 inspections.

Inverted Siphon Cleaning

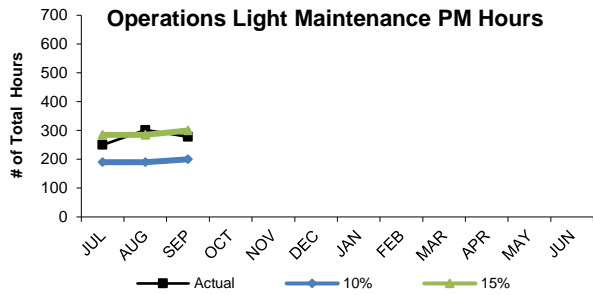


Staff cleaned 9 siphon barrels this quarter.

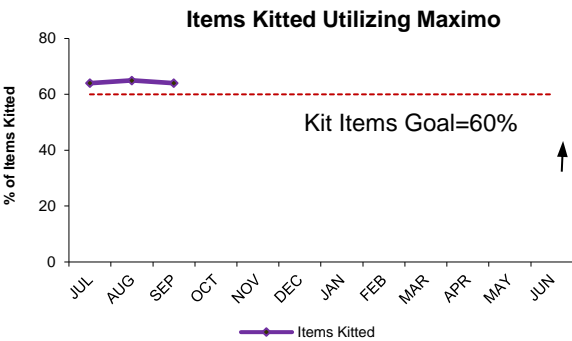
Field Operations' Metropolitan Equipment & Facility Maintenance

1st Quarter - FY22

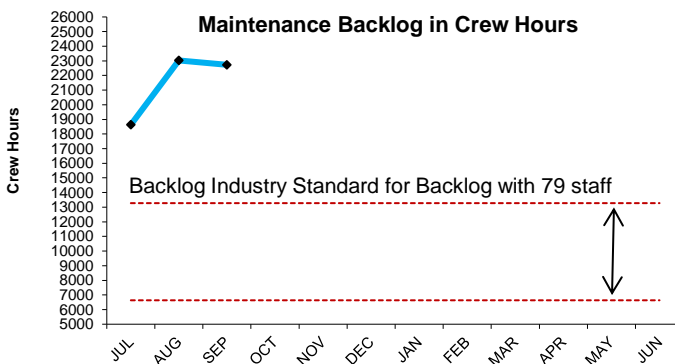
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



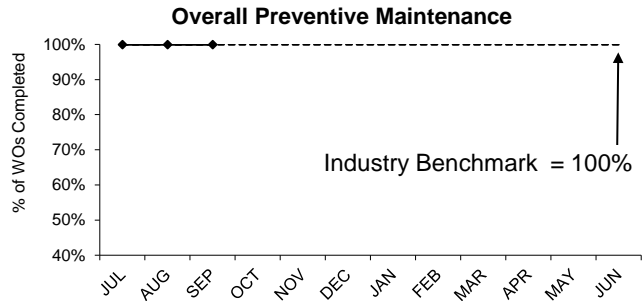
Operations staff averaged 277 hours per month of preventive maintenance during the 1st Quarter of FY22, an average of 14% of the total PM hours for the 4th Quarter, which is within the industry benchmark of 10% to 15%.



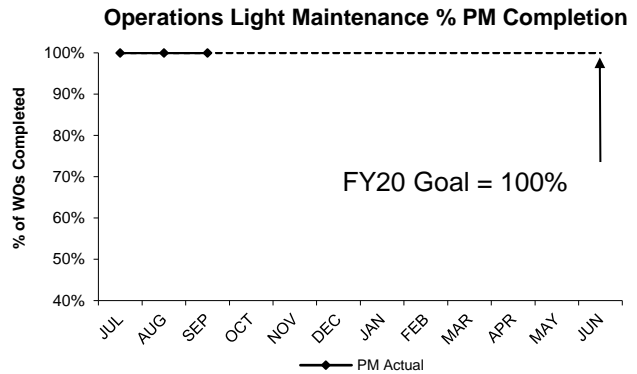
Operations' FY22 maintenance kitting goal has been set at 60% of all work orders to be kitted. Kitting is the staging of parts or material necessary to complete maintenance work. In the 1st Quarter of FY22, 64% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



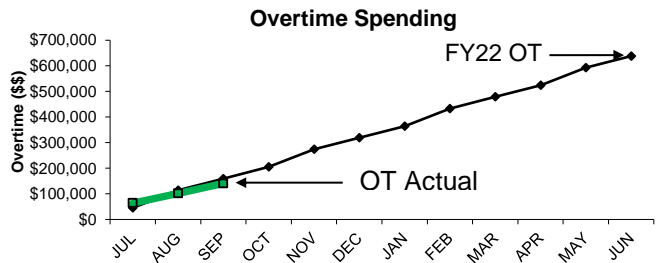
The 1st Quarter of FY22 backlog average is 21,466 hours. Management's goal is to continue to control overtime and try to get back within the industry benchmark of 6,636 to 13,275 hours. The increase is due to vacations and two large maintenance projects.



The Field Operations Department (FOD) preventive maintenance goal for FY22 is 100% of all PM work orders. Staff completed 100% of all PM work orders in the 1st Quarter of FY22.



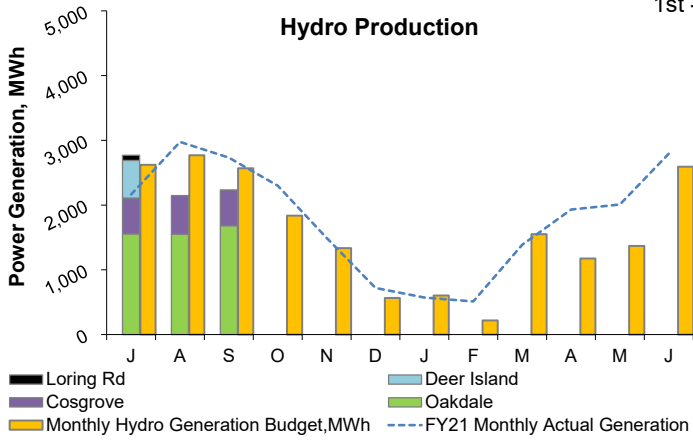
Wastewater Operations complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY22 PM goal is completion of 100% of all PM work orders assigned. Operations completed 100% of PM work orders in the 1st Quarter of FY22.



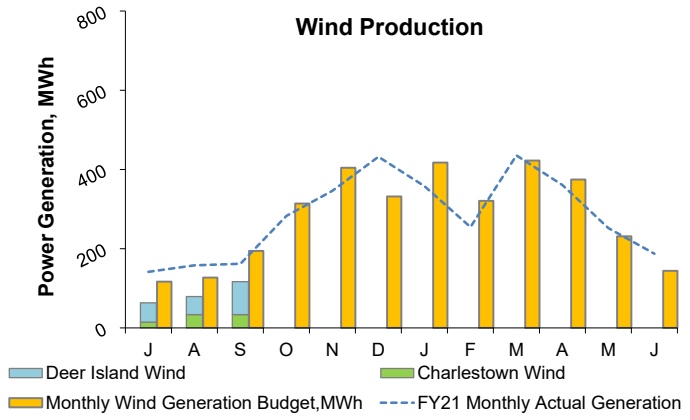
Maintenance overtime was \$6,293 under budget on average, per month, for the 1st Quarter of FY22. Overtime is used for critical maintenance repairs and wet weather events. The overtime budget for the 1st Quarter of FY22 is \$159,549 and we are \$18,879 under budget for the fiscal year.

Renewable Electricity Generation: Savings and Revenue

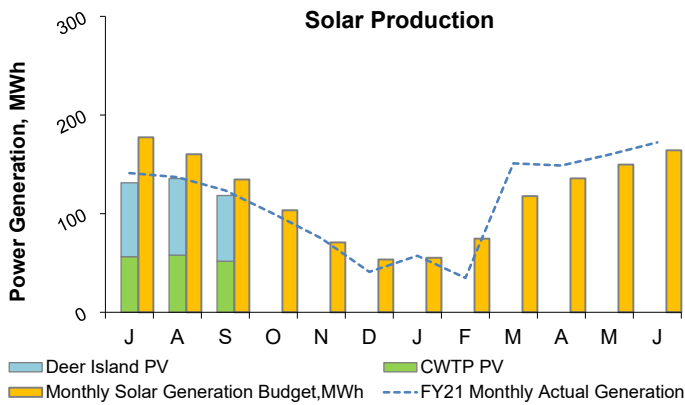
1st - Quarter - FY22



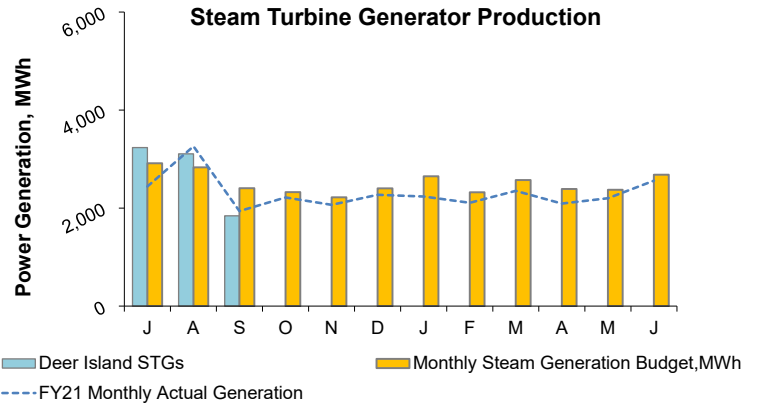
In Quarter 1 of FY22, the renewable energy produced from all hydro turbines totaled 8226 MWh; 3% above budget³. The total savings and revenue to date in FY22 (actuals through July¹) is \$120,135 ; 29% above budget³. The savings and revenue value does not include RPS REC revenue (see next page).



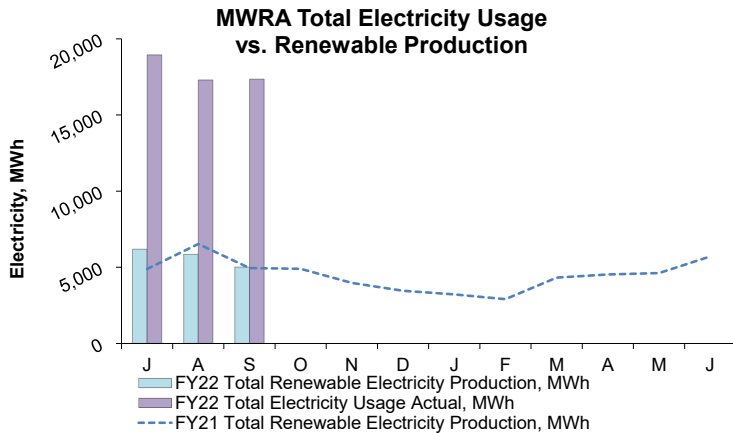
In Quarter 1 of FY22, the renewable energy produced from all wind turbines totaled 259 MWh; 41% below budget³. The total savings and revenue to date in FY22 (actuals through July¹) is \$8,376 ; 62% below budget³. The savings and revenue value does not include RPS REC revenue (see next page).



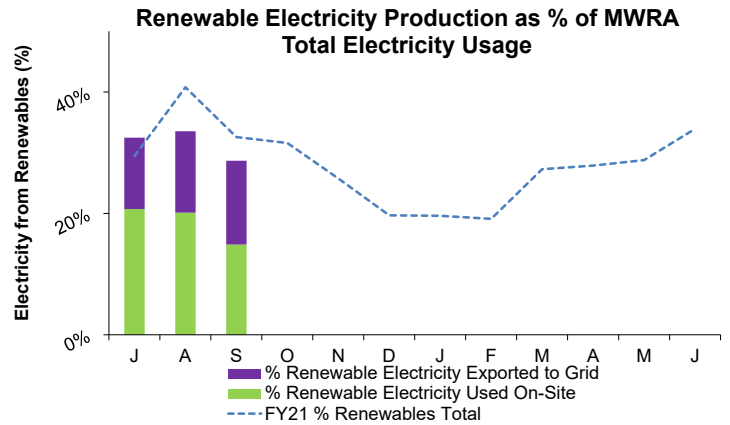
In Quarter 1 of FY22, the renewable energy produced from all solar PV systems totaled 385 MWh; 17% below budget³. The total savings and revenue to date in FY22 (actuals through July¹) is \$17,977 ; 62% below budget³. The savings and revenue value does not include RPS REC revenue (see next page).



In Quarter 1 of FY22, the renewable energy produced from all steam turbine generators totaled 8,184 MWh; on budget³. The total savings and revenue to date in FY22 (actuals through July¹) is \$330,935 ; 21% above budget³. The savings and revenue value does not include RPS REC revenue (see next page).



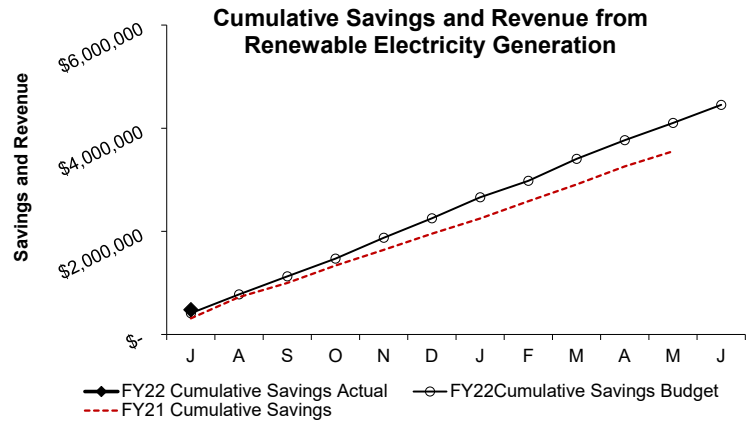
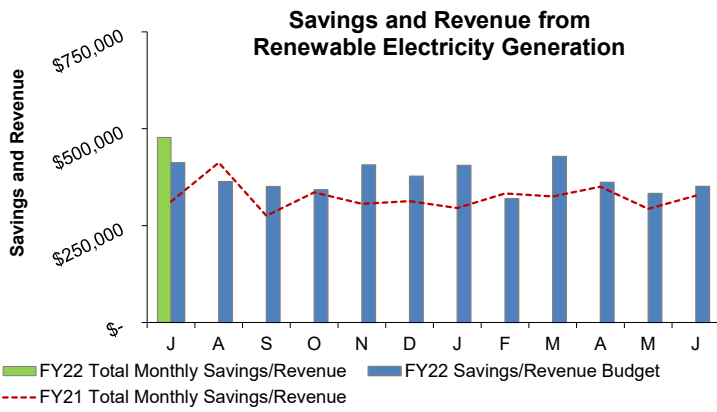
In Quarter 1 of FY22, MWRA's electricity generation by renewable resources totaled 17,055 MWh, on budget.. MWRA's total electricity usage was approximately 53,611 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site 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. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.



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

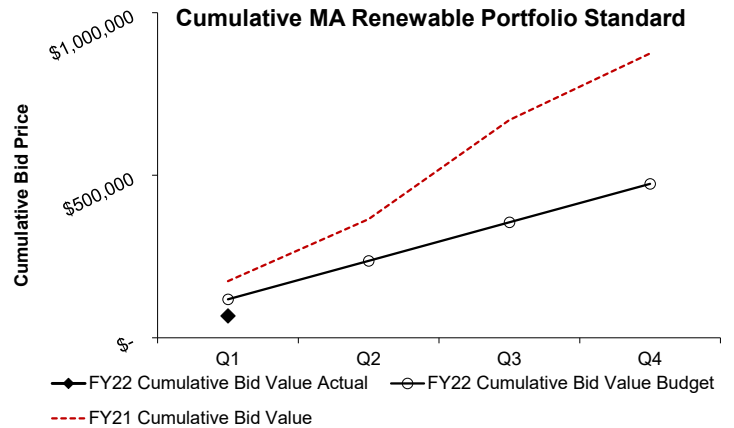
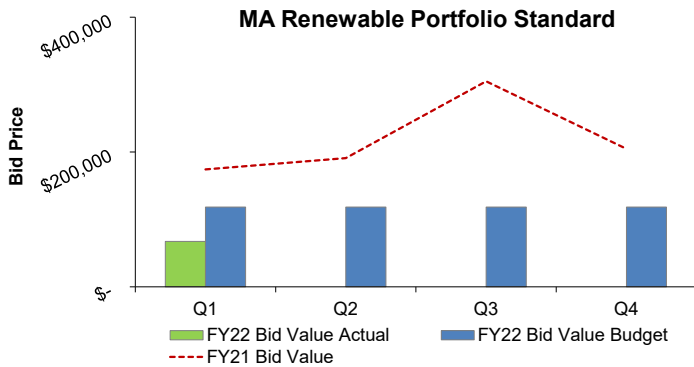
Renewable Electricity Generation: Savings and Revenue

1st - Quarter - FY22



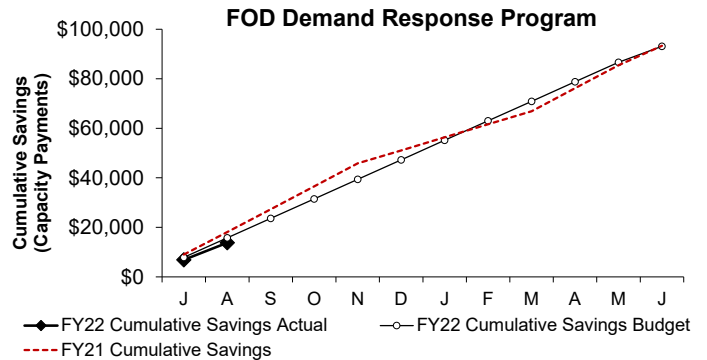
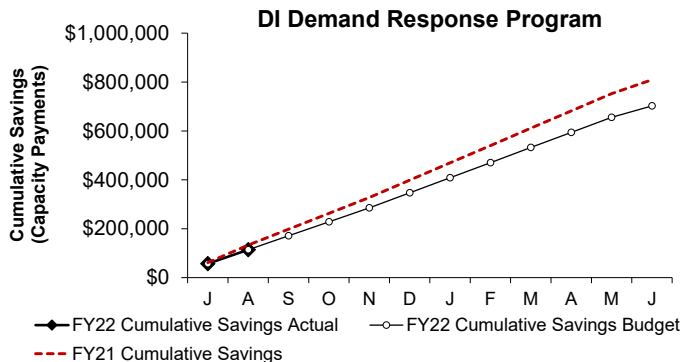
Savings and revenue from MWRA renewable electricity generation in the first month of FY22 (actuals only through July¹) is \$477,423; which is 16% above the budget³.

Savings and revenue² from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs). The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value



Bids were awarded during the 1st Quarter¹ from MWRA's renewable energy assets; 1,499 Q1 CY2021 Class I Renewable Energy Certificates (RECs) and 45 Q1 CY2021 Solar RECs were sold for a total value of \$67,358 RPS revenue; which is 48% below budget³ for the Quarter. REC values reflect the bid value on the date that bids are accepted. Cumulative bid values reflects the total value of bids received to date.

*Only Class I and Solar RECs are being reported for Q1 CY2021 sales. Class II RECs have not been sold and are currently reserved for future sale.

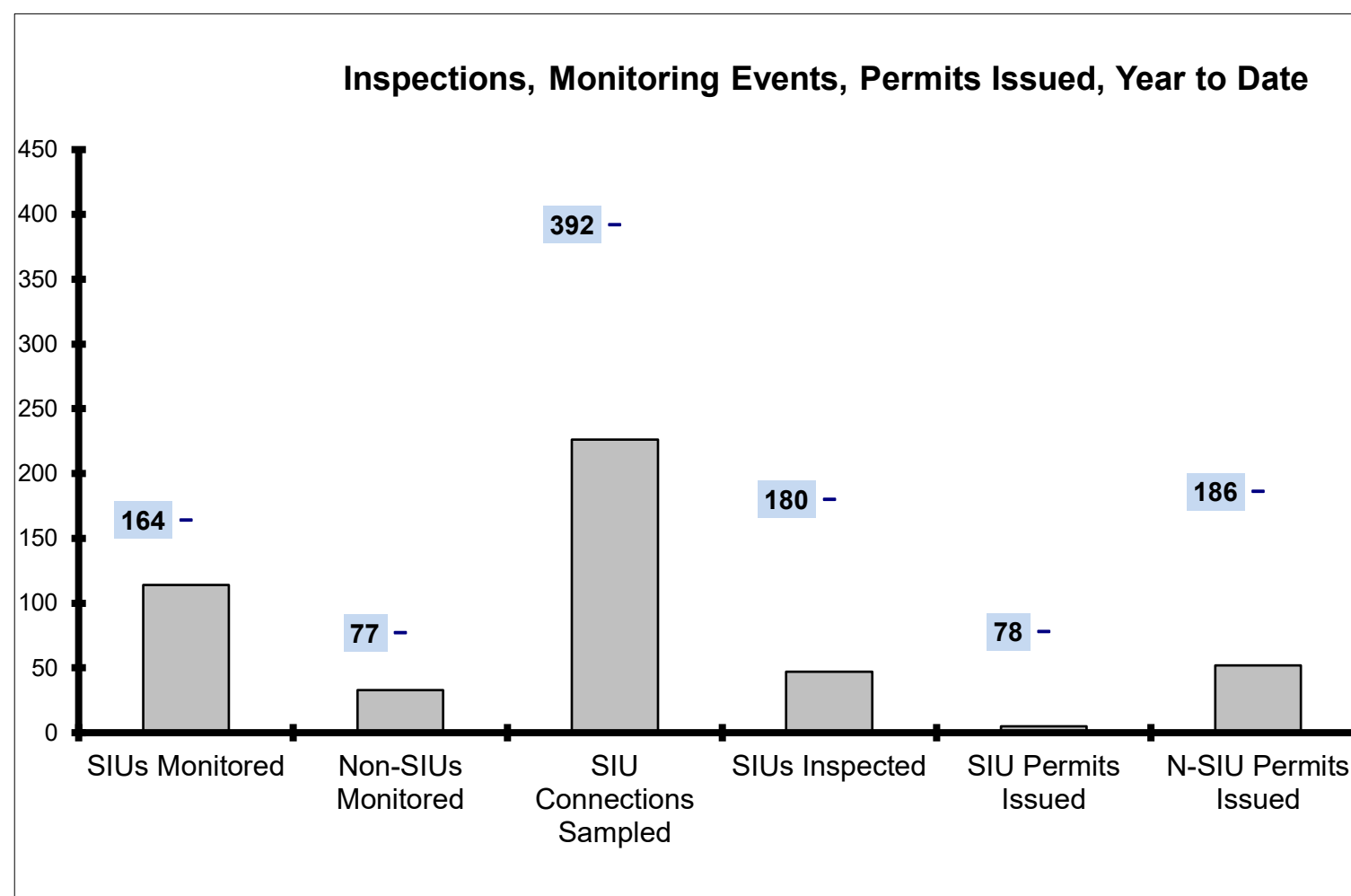


Currently Deer Island, JCWTP, Loring Rd, and Brutsch participate in the ISO-New England Demand Response Programs⁴. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY22 Cumulative savings (Capacity Payments only) through August¹ total \$114,009 for DI and payments for FOD total \$13,782 for the same period¹.

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

Toxic Reduction and Control

1st Quarter - FY22



EPA Required SIU Monitoring Events for FY22: 164
YTD: **114**

Required Non-SIU Monitoring Events for FY22: 77
YTD: **33**

SIU Connections to be Sampled For FY22: 392
YTD: **226**

EPA Required SIU Inspections for FY22: 180
YTD: **47**

SIU Permits due to Expire In FY22: 78
YTD: **5**

Non-SIU Permits due to Expire for FY22: 186
YTD: **52**

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; however, many of these industries have more than one sampling point and the "SIU Connections Sampled" data reflect samples taken from multiple sampling locations at these industries.

EPA requires MWRA to issue or renew 90 percent 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 percent of SIU permits to be issued within 180 days.

	Number of Days to Issue a Permit						Permits Issued	
	0 to 120		121 to 180		181 or more		SIU	Non-SIU
	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU		
Jul	3	9	2	1	0	0	5	10
Aug	0	14	0	6	0	3	0	23
Sep	0	7	0	8	0	4	0	19
Oct							0	0
Nov							0	0
Dec							0	0
Jan							0	0
Feb							0	0
Mar							0	0
Apr							0	0
May							0	0
Jun							0	0

% YTD	60%	58%	40%	29%	0%	13%	5	52
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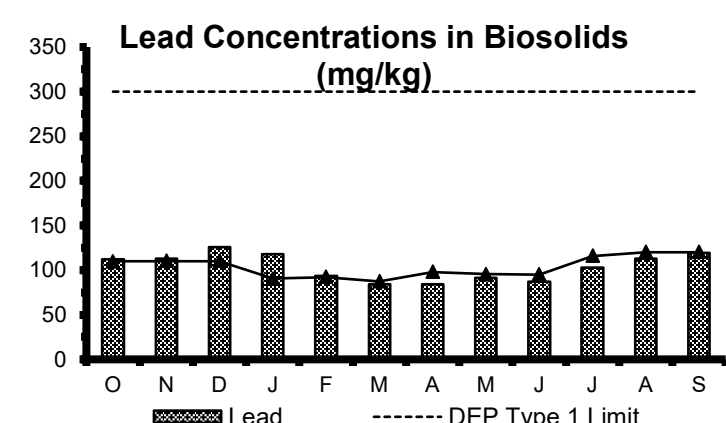
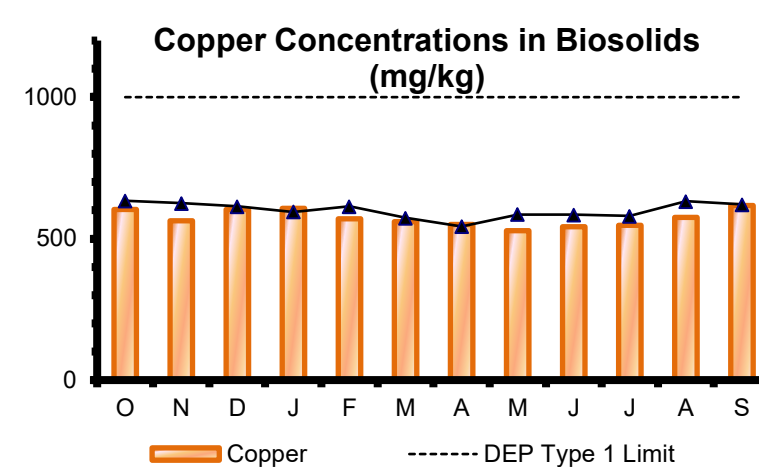
This is the first quarter of the MWRA fiscal year, FY22. SIU permit issuances are off to a slow start. This is mainly due to the incidences of staff turnover coupled with the workload of the available personnel.

In the first quarter, 57 permits were issued, 5 of which were SIUs. Three of the SIU permits were issued within the 120-day timeframe. There were 52 non-SIU permits issued, of which 22 were issued late.

Reasons for late issuances include: waiting for critical data needed for permit processing; project delays relating to new start-ups and to new construction dewatering activities. Some of these translated to late payment of the relevant permit charges and permits were issued beyond the 120-day timeframe.

For the Clinton Sewer Service area, there were no SIU permits issued in the first quarter of the fiscal year.

TRAC's annual monitoring and inspection goals are set at the beginning of each fiscal year but they can fluctuate due to the actual number of SIUs. Monitoring of SIUs and Non-SIUs is dynamic for several reasons, including: newly permitted facilities; sample site changes within the year requiring a permit change; changes in operations necessitating a change in SIU designation; non-discharging industries; a partial sample event is counted as an event even though not enough sample was taken due to the discharge rate at the time; and also, increased/decreased inspections leading to permit category changes requiring additional monitoring events.



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.

Overall, copper and lead levels remain relatively constant, below the DEP Type 1 Limit, and within the range of values over the past several years.

A discussion of molybdenum concentrations in biosolids is included in the Deer Island Residuals Pellet discussion.

Field Operations Highlights

First Quarter – FY22

This section provides selected snapshots of activities during the quarter.

Western Water Operations and Maintenance

- **Hultman Aqueduct Natick Future Connection** – In September, staff partially drained the Hultman Aqueduct from Shaft L in Framingham to Norumbega covered storage to facilitate the removal of a blind flange at Rt 30 in Natick to install piping and valves for a future connection. Draining took approximately 5 days and refilling 3 days.
- **Metro West Tunnel Shaft L** – In July as part of the investigation for cathodic protection and corrosion control, the Western Maintenance partnered with a Metro Pipeline Crew to excavate the interconnection piping between the Metro West Tunnel and the Hultman Aqueduct at Shaft L in Framingham. Staff were able to identify the pipe coupler location, type of coupler used, and if it was coated or encased. This information will be used to develop a larger project to protect this pipe coupler from corrosion.
- **Wachusett Reservoir Railroad Camera** – In July, MWRA and DCR completed the installation of a new security camera that allows MWRA security to monitor activity on the railroad track 24/7 and provide notification if a problem occurs with the rail crossing over the reservoir.

Operations Engineering

- Staff continued community assistance as needed, including Newton System: installed additional pressure recorders and reviewed data to determine possible cause of system losses.
- Staff supported planning for Wayland and Natick emergency connections to MWRA, and developed operational plans for the isolation and dewatering of the Hultman for the installation of a valve at the Rte30 Hultman connection.
- Staff provided information for possible system expansion to the south and north.

SCADA

- **Water System Work Staff** completed the replacement of a data diode server at Chelsea OCC and completed the implementation of redundant plant influent flow transmitter signal selection at JCWTP. Staff completed communication network migration from copper to fiber at Belmont PS and completed work on the communication improvement of Oakdale Power Station. Staff completed work on the replacement of the western application license server and troubleshoot and replaced Weather Station's processor at JCWTP. Staff modified Nonantum Rd PRV PLC program to increase loss of communication delay timer and installed new wide screen monitors at the OCC for high performance graphics projects. Staff troubleshoot BFV-13 of vault 1 for not working in remote at Norumbega Covered Storage.

- **Wastewater System Work** Staff completed work on SCADA redundant communication enhancement at S. Boston PS and replaced a defective SCADA node at Cottage Farm. Staff completed work on adding Quincy PS influent level alarm set point screen and completed work on fixing the speed control computation for Alewife PS. Staff continued work on configuring and hardening of SCADA Windows operating system upgrades. Staff continued work on Active Directory implementation and continued on support for Chelsea Headwork Rehabilitation Project, Nut Island Odor Control Improvements Project, and Hayes P.S. Improvements Project.

Wastewater Operations & Maintenance

- **Cottage Farm CSO**: Staff conducted a tour of the facility for the Charles River Watershed Association on 7/7/21.
- **Union Park CSO Facility Operation & Maintenance**: Operations staff attended a series of meetings with BWSC to discuss and update contract language in preparation for rebidding the O&M contract, to discuss upgrades to SCADA system and odor control carbon replacement.
- **Remote Headworks Upgrades - Contract #7161**: Operations staff continued to work with Engineering & Construction staff and the contractor on this project. This included support of facility power loss test for state electrical inspector, improvements to catenary screens and testing tunnel shaft level. All channels and odor control system are in service. Operations staff attended SCADA handbook review meeting on 8/5/21. This included support of final air balancing, repairing duct leaks, replacing fuel oil valve on generator, and testing the new security system during the month of August 2021.

Metering

- This summer was exceptionally rainy, especially the months of July and September, so demand was much lower system wide compared to both FY21 and the prior three years. The largest changes were seen in the communities which typically see increases in demands due to lawn care in hotter and drier weather, while the communities closer to Boston saw more modest decreases in demand. Overall the system saw an over 10% decrease in demand compared to Q1 FY21, and an 8% decrease compared to the three year average for FY18-20.
- Metering Staff is assisting DCR staff with an assessment of the sewer flow meters in the Rutland-Holden sewer interceptors located and maintained by DCR. Wyatt Engineering has been retained to perform a 3rd party assessment of the Station C and Station D. After review of Wyatt Engineering recommendations, MWRA will be installing a new Flow meter at Station D for future billing.
- MWRA Metering Staff reached out to the following communities to discuss abnormal flow patterns and higher than usual demand; Somerville, Reading, Milton, and Saugus.

Wastewater upgrade project:

- The Authority's installation contractor, ADS Associates began installations on April 26, 2021. Through September, ADS installed meters at 148 of 174 total installations and is on track to complete installations by their stated deadline of October 25, 2021
- For the purposes of wastewater billing, the MWRA has informed communities that they will be billed for a sewer volume equal to the last 3 years average monthly flow. This methodology was presented to the Advisory board in June 2020 and was in accordance with wastewater billing during the last replacement project in 2004. This methodology will remain in use until all new wastewater meters have been installed and successfully placed into service.

TRAC

- TRAC issued 77 Notices of Violation, 2 Notices of Noncompliance and 3 Extension Letters.
- TRAC issued 57 MWRA 8(m) Permits allowing companies to work within an easement or other property interest held by the Authority. Permits were issued in an average of 68 days from the date the application was received.
- TRAC monitored the septage receiving sites 33 times. Staff conducted inspection at 9 new construction gasoline/oil separators and 119 existing gasoline/oil separators.
- 57 MWRA Sewer Use Discharge Permits were issued and/or renewed to its sewer users. No permits were issued and/or renewed in the Clinton Service Area.
- TRAC completed 226 first time SIU monitoring events, 38 first time NSIU monitoring events and 566 other sampling events including Clinton NPDES, Clinton Local Limits, Metropolitan Local Limits, Clinton and Metropolitan Local Limits PFAS, Special Sulfide, Cosgrove and Oakdale NPDES, CSO NPDES, Sudbury Aqueduct and CSO Hypochlorite Tank chemical sampling.

Environmental Quality-Water

- Algae monitoring continued throughout the quarter at Wachusett and Quabbin Reservoir. The buoy data continues to help assess algae concentrations and focus sampling efforts. All nuisance algae remained below levels of concern.
- Starting in May, staff collected samples for MWRA's nitrification-monitoring program. Data Management staff, in coordination with the Planning Department, reviewed the Environmental Working Group's latest draft of the National Drinking Water Database, 2014-2019. Staff issued a data correction comment letter to EWG and DEP.
- Sampling & Analysis: Staff provided support to Framingham and Brookline for storage tank clearance sampling and testing and to Marlborough regarding a discolored water complaint. Staff also assisted Winthrop with coliform sampling on September 20 & 21.

- Training & Guidance: On three occasions, staff provided training to community water department staff on proper coliform sampling technique and chlorine residual measurement. Staff also met with Norwood, Winthrop and Chelsea to review their drinking water compliance.

- Staff continued to collect samples for the CWTP pipe-loop study using community lead service lines with various corrosion control treatments.

- Pipeline Clearance Sampling: Staff assisted with sample collection and testing of samples collected from Section 79 pipeline, one section of the Hultman Aqueduct, and along one section of WASM-3 in Arlington/Somerville.

- Staff proactively replaced buoy sondes with freshly calibrated ones in July and September. Staff are using buoy-profiling data to monitor trends for reservoir stratification, algae, and the Quabbin Reservoir interflow.

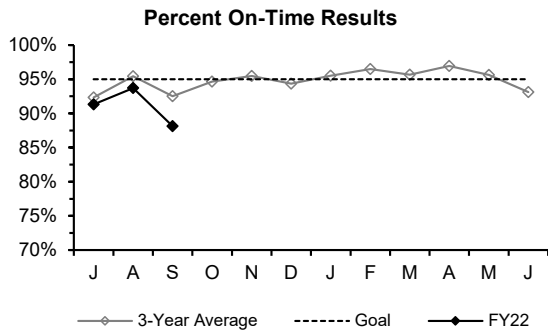
- Chemical Supply contracts: Staff are closely monitoring bulk chemical inventories and contract adherence to delivery schedules. Staff met with chemical suppliers throughout the quarter to review contract requirements and scheduled deliveries. An update was provided to Sr. Management, EPA and DEP regarding liquid oxygen supplies due to use of this chemical for medical facilities in response to COVID-19.

Environmental Quality-Wastewater

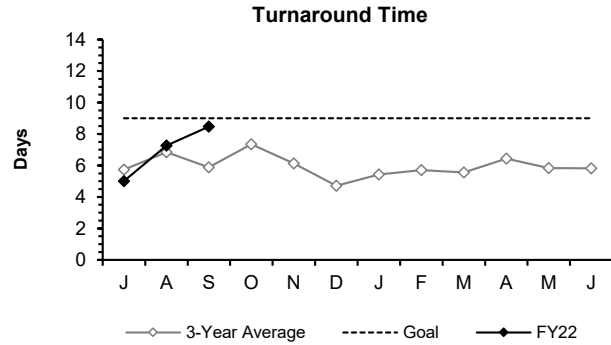
- Ambient Monitoring: Monitoring consultants continued routine water column surveys and annual sediment surveys of Boston Harbor and Massachusetts Bay, completed special surveys in response to a red tide bloom, and completed triennial collection of mussel bioaccumulation samples and lobsters in the Harbor and Massachusetts Bay to analyze tissue contamination. During the July and August water column surveys, samples for metals analyses were also collected in response to an EPA data request. Results from the September survey showed exceedance of the dissolved oxygen percent saturation threshold in Stellwagen Basin; to the regulators and interested parties. Staff participated in an *ad hoc* committee meeting of the Outfall Monitoring Science Advisory Panel, considering issues related to contaminants of emerging concern and eutrophication issues in Massachusetts and Cape Cod Bays.

- Biweekly harborwide and CSO receiving water monitoring continues. COVID-19 protocols were lifted in June so the full suite of collections and analyses were performed in Q1. The annual report on CSO receiving water quality monitoring in Upper Mystic River/Alewife Brook and Charles River was submitted on July 15 as required by the Variances.

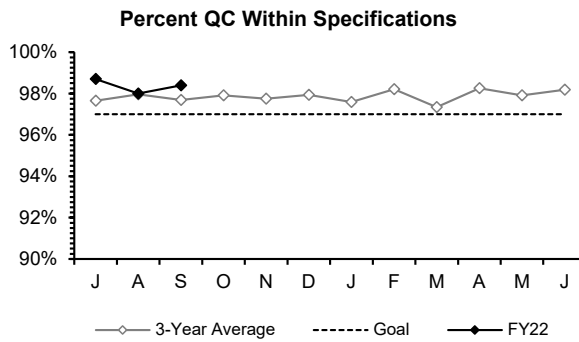
Laboratory Services 1st Quarter - FY22



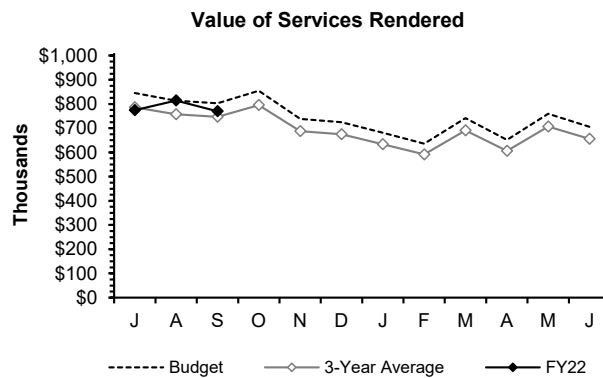
The Percent On-Time measurement fell below the 95% goal due to staffing vacancies.



Turnaround Time met the 9-day goal.



Percent of QC tests meeting specifications met the 97% goal.



Value of Services Rendered fell below the annual budget projection due to staffing vacancies

Highlights:

Performance: Met Turnaround Time, Percent QC within Specification indicators for the quarter at reduced staffing level. Value of Services Rendered is slightly below budget, but ahead of the 3-year average year to date.

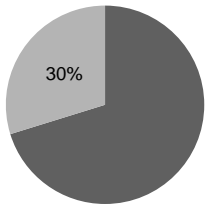
School Lead Program: During the 1st quarter of FY22, MWRA's lab completed 244 tests from 58 schools and childcare facilities in 28 communities. Since 2016, MWRA's Laboratory has conducted over 39,000 tests from 531 schools and daycares in 44 communities.

Community Lead Testing: Received compliance lead samples from two communities for the first time, Wakefield and Wilbraham.

CONSTRUCTION PROGRAMS

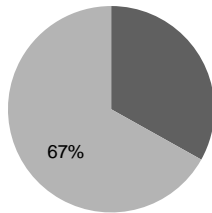
Projects In Construction 1st Quarter – FY22

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Permanent Metering Replacement and Installation

Project Summary: This project consists of the replacement of 174 flow meters in sewer manholes located throughout the MWRA service district.

Contract Amount: \$3,286,114

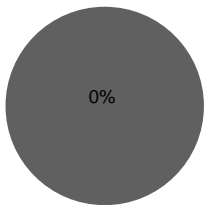
Contract Duration: 450 Days

Notice to Proceed: 3-Dec-20

Contract Completion: 26-Feb-22

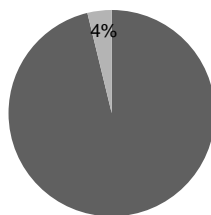
Status and Issues: As of September, the Contractor has installed 147 meters. The meter confirmations are up to date.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Section 89 Replacement Pipeline

Project Summary: This project will include replacement of a 10,500-foot portion of PCCP with class IV reinforcing wire, line valves, appurtenances, and abandonment of the 118-year old, 24-inch diameter cast iron Section 29 pipeline.

Contract Amount: \$32,619,000

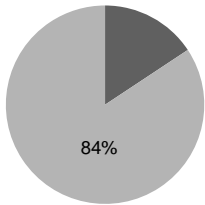
Contract Duration: 1,475 Days

Notice to Proceed: 15-Aug-21

Contract Completion: 25-Aug-25

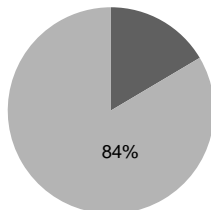
Status and Issues: As of September, the Contractor began securing the necessary permits and is providing submittals for review.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Dorchester Interceptor Sewer

Project Summary: MWRA's Dorchester Interceptor conveys flows to MWRA's Columbus Park Connection and Headworks in South Boston

Contract Amount: \$4,707,485

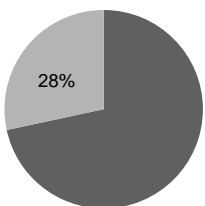
Contract Duration: 540 Days

Notice to Proceed: 6-Jul-20

Contract Completion: 29-Dec-21

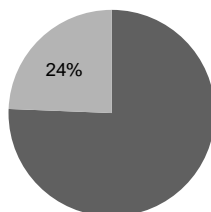
Status and Issues: The Contractor spent the month of September sealing manhole leaks and epoxy coating the manholes. They completed the required pull test of the epoxy coating and epoxy coated the last 15.5' of sewer main.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Rehabilitation of WASM 3

Project Summary: This project consists of the rehabilitation of 13,800 feet of 56-inch and 60-inch diameter water main in Arlington, Somerville and Medford.

Contract Amount: \$19,555,353.06

Contract Duration: 1,383 Days

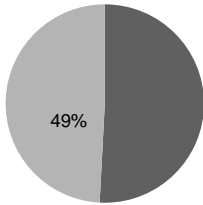
Notice to Proceed: 28-Oct-20

Contract Completion: 11-Aug-24

Status and Issues: As of September, the Contractor established staging areas at DCR permitted land on Coral Street and on Mystic Valley Parkway in Arlington. They supported MWRA operations in isolating and dewatering W12 and Section 51 water mains in Arlington and Somerville.

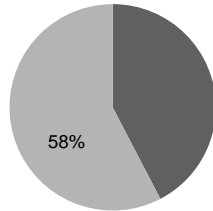
Projects In Construction 1st Quarter – FY22

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Nut Island Odor Control and HVAC

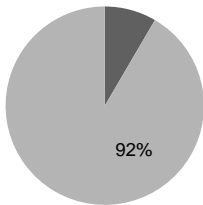
Project Summary: This project will provide upgrades to the odor control system, heating, ventilation and air conditioning system and other equipment.

Contract Amount: \$58,115,295.10 **Contract Duration:** 1,034 Days

Notice to Proceed: 12-Feb-20 **Contract Completion:** 12-Dec-22

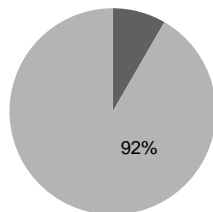
Status and Issues: As of September, the Contractor completed installation of slide gate (SG-3), leak tested, and started up. Moved stop logs from SG-3 channel to SG-4 channel. Demolished existing SG-4. Set new odor control fan 3 on new equipment pad. Started installation of new FRP ductwork for odor control fan 3.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Chemical Tank Relining & Pipe Replacement

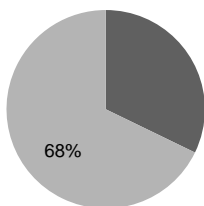
Project Summary: This project involves replacing the chlorobutyl rubber linings in 3 sodium hypochlorite and 2 sodium bisulfite storage tanks and assorted gravity thickener overflow piping at Deer Island.

Contract Amount: \$8,680,743 **Contract Duration:** 850 Days

Notice to Proceed: 13-Aug-19 **Contract Completion:** 10-Dec-21

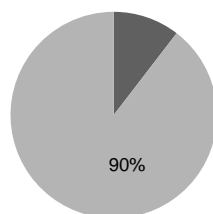
Status and Issues: As of September, the Contractor completed steam cure for Sodium Hypochlorite Tank No. 2. Began 7-day leak test. Paint exterior nozzles & manways. In addition, they continued installing rubber liner for Sodium Bisulfite Tank No. 2.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Clinton Valve and Pipe Replacement

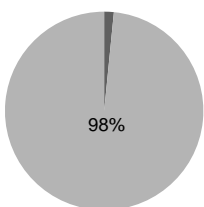
Project Summary: This project involves the replacement of return activated sludge, waste activated sludge and plant water valves and associated piping.

Contract Amount: \$476,600 **Contract Duration:** 460 Days

Notice to Proceed: 8-Sep-20 **Contract Completion:** 12-Dec-21

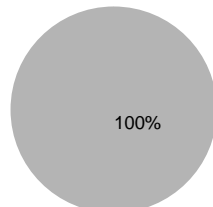
Status and Issues: As of September the Contractor began demolition and installation of all valves on the Clariflocculator 1 and 2 side of the Chemical Building Basement. Authority staff shut down the RAS system and drained the RAS suction and discharge piping on to allow the Contractor to install the first of the isolation valves.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Gravity Thickener Rehabilitation

Project Summary: This project involves the upgrade of all six gravity thickeners, including the complete replacement of each tank's sludge and scum thickening equipment and 5 of the 6 FRP dome covers.

Contract Amount: \$19,979,541.22 **Contract Duration:** 1,230 Days

Notice to Proceed: 11-May-18 **Contract Completion:** 22-Sep-21

Status and Issues: As of September, the Contractor worked on punchlist items.

CSO CONTROL PROGRAM

1st Quarter – FY22

All 35 projects in the CSO Long-Term Control Plan (LTCP) were complete as of December 2015 in compliance with milestones in the Federal District Court Order. MWRA is conducting a multi-year CSO post-construction monitoring program and performance assessment that will culminate in a report to EPA and DEP in December 2021 that shows that 70 of 86 outfalls achieve compliance with the LTCP. MWRA and its member CSO communities are moving forward with plans to rectify 6 of the 16 CSOS. The remaining 10 will require further investigation to determine an appropriate plan. The MWRA is in discussion with the court parties and anticipates a 3-year extension to accomplish these remaining efforts. Of the \$912.5 million budget in the FY21 CIP for the CSO Control Program, **approximately \$5.8 million remain to be spent**, as described below.

Project/Item	Status as of September 30, 2021
BWSC Dorchester Interceptor Inflow Removal	This agreement with BWSC provided up to \$3.76 million in MWRA financial assistance for reimbursement of the eligible costs of construction to remove inflow from the BWSC's Dorchester Interceptor system. BWSC awarded one construction contract for inflow removal in the amount of \$1.58 million. BWSC completed the contract work on June 30, 2021, when the financial assistance agreement ended. \$2.18 million of remaining funds in the Dorchester agreement has been transferred into a new agreement by which BWSC will construct sewer separation and other CSO improvements in East Boston (see below).
BWSC East Boston Sewer Separation and other CSO Improvements	On April 14, 2021, the MWRA Board of Directors authorized the East Boston CSO financial assistance agreement in the amount of \$2.18 million for a term of two years, from July 1, 2021 through June 30, 2023. BWSC and MWRA executed the agreement on June 10, 2021. BWSC has awarded East Boston Sewer Separation Contract 3 and is finalizing design of an upgraded connection to the MWRA system to lower CSO discharges at Outfall BOS014. Per the agreement, BWSC has submitted a request for payment of two-thirds of the agreement amount upon contract award, which had been processed on September 16, 2021 in the amount of \$1,454,445. A request for payment of the remaining one-third of the agreement amount will be made after finalization and award of the BOS014 modifications.
City of Cambridge MOU and Financial Assistance Agreement	The City of Cambridge attained substantial completion of its last MWRA CSO plan project in December 2015 in compliance with Schedule Seven. The \$100.2 million MOU/FAA by which MWRA funded the eligible costs of the Cambridge-implemented CSO projects ended on June 30, 2018. MWRA recently completed final eligibility review of the Cambridge construction contracts and expects to issue a final eligibility certification <u>this fall</u> .
City of Somerville Financial Assistance Agreement	By this agreement, MWRA will provide up to \$1.4 million upon construction award of City of Somerville's repair of its combined sewer trunk line upstream of the Somerville Marginal CSO Facility. Pursuant to the agreement, the repair work is intended to maintain the full in-system storage capacity of the trunk sewer to support CSO control. Somerville is finalizing design that includes a cementitious/geopolymer lining and expects to award the construction contract in the fall of 2021.
MWRA CSO Performance Assessment – Contract 7572	<p>MWRA issued the Notice to Proceed with the contract for CSO Post-Construction Monitoring and Performance Assessment to AECOM Technical Services, Inc., in November 2017. The contract includes CSO inspections, overflow metering, hydraulic modeling, system performance assessments and water quality impact assessments, culminating in the submission of a report to EPA and DEP in December 2021 verifying whether the LTCP goals are attained. The current contract amount is \$5.28 million <u>of which approximately \$4.6 million has been spent</u>.</p> <p>On August 30, 2019, DEP issued five-year CSO variances to water quality standards for the Lower Charles River/Charles Basin and the Alewife Brook/Upper Mystic River effective through August 31, 2024. The variance conditions include receiving water quality modeling and CSO and stormwater sampling; the evaluation of certain additional CSO controls; other requirements intended to minimize CSO discharges, their impacts and public health risk; and preparation of updated CSO control plans for these waters. In compliance with the CSO variances, MWRA has implemented a subscriber-based system to notify the public of CSO discharges at its permitted outfalls within four hours of the start of discharge at each location, using meter readings. MWRA also reports estimated discharge volumes on its CSO notification web page. Cambridge and Somerville are also parties to the variances and have implemented notification systems for their own outfalls. AECOM continues to make progress with CSO variance-required project evaluations and other site-specific investigations to mitigate CSO discharges at locations where LTCP goals are not yet attained. In these efforts, MWRA is maintaining close coordination with the CSO communities. CSO mitigation implemented in late 2020/early 2021 included: BWSC completed its East Boston sewer separation Contract 1, Chelsea raised the overflow weir at Outfall CHE004, Cambridge removed heavy sediments in the Outfall CAM401A system, and MWRA is designing a replacement for the interceptor connection at Outfall CHE008 - all expected to bring associated outfalls into attainment with LTCP discharge goals. In addition, Cambridge completed the partial sewer separation improvements that have reduced discharges from the Cottage Farm facility. MWRA has reached the 100% design stage associated with the new interceptor connection at Chelsea's Outfall CHE008 which is currently under review. Design has begun to add a connection to the Somerville Marginal Conduit upstream of the Somerville Marginal Facility which is predicted to significantly reduce CSO discharges at from the facility (MWR205/MWR205A). MWRA and BWSC continue to work on a project to improve flow conveyance at Outfall BOS017 in Charlestown. Final design of the dry-weather connection in East Eagle Square to be constructed under an allowance with BWSC's Construction contract 3 (partially funded by MWRA) is being reviewed. BWSC has also commenced construction of South Boston sewer separation Contract 1 that will lower CSO discharges to Fort Point Channel.</p> <ul style="list-style-type: none"> • AECOM updated the MWRA hydraulic model to Q1-2021 system conditions in part to produce an updated Typical Year CSO performance assessment relative to the LTCP activation and volume goals. The updated assessment shows attainment of the goals at 70 of 86 discharge locations active in the late 1980's, including outfalls that have been closed. MWRA forecasts attainment at an additional six outfalls with scheduled completion after 2021 of recently recommended MWRA and community CSO improvements (many are mentioned above). At 10 discharge locations, MWRA and the CSO communities continue to identify and evaluate alternatives to further reduce discharges. • Utilizing receiving water quality models of the Lower Charles River and the Alewife Brook/Upper Mystic River AECOM completed and calibrated last fall, it performed water quality assessments of current river conditions and the impacts of remaining CSO and non-CSO (dry weather and stormwater) pollution sources. MWRA responded to comments provided on the draft and distributed a final Water Quality Assessment Report to EPA, DEP, the CSO communities, Charles River Watershed Association, and Mystic River Watershed Association. MWRA is working on completing the draft Water Quality Alternatives Assessment report.

CIP Expenditures 1st Quarter – FY22

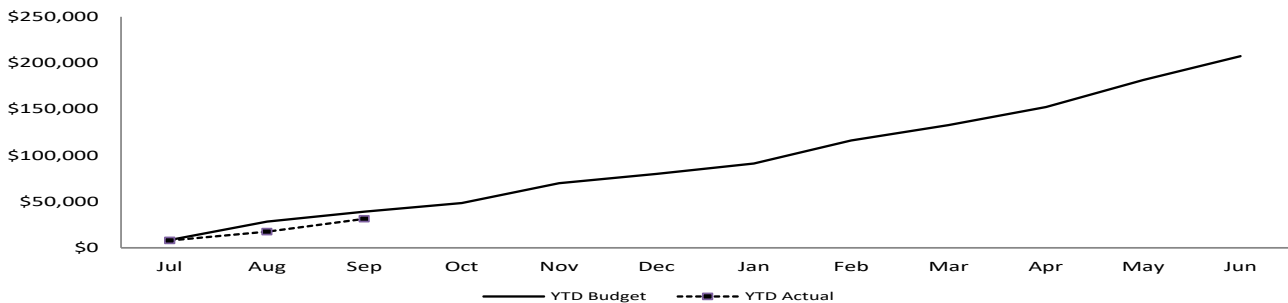
FY22 Capital Improvement Program Expenditure Variances through September by Program - (\$ in thousands)				
Program	FY22 Budget Through September	FY22 Actual Through September	Variance Amount	Variance Percent
Wastewater	\$24,452	\$19,622	(\$4,830)	-19%
Waterworks	\$12,246	\$10,589	(\$1,657)	-14%
Business and Operations Support	\$2,540	\$1,286	(\$1,254)	-49%
Total	\$39,238	\$31,497	(\$7,741)	-20%

Project underspending within Wastewater was due to timing of grant and loan distributions for the I/I Local Financial Assistance program, slower than anticipated meter installations/acceptances for the Wastewater Metering contract, timing of work for Winthrop Terminal Facility (WTF) VFD Replacement and Gravity Thickener Rehab contracts, completion of some design and inspection tasks were later than anticipated for Ward Street and Columbus Park Headworks Upgrades Design/CA, and timing of work and weather impacts for the Dorchester Interceptor Sewer. This underspending was partially offset by work scheduled in FY21 that was completed in FY22 for the NI Odor Control & HVAC Construction and Chelsea Creek Headworks Upgrades, work completed earlier than anticipated for East Boston CSO Control, and timing of payment for Dorchester I/I Removal work. Project underspending in Waterworks was due to timing of community distributions for the Water Loan program, later than anticipated start-up for the NIH Section 89 & 29 Replacement, work planned in FY21 completed in FY22 and summer shutdown for WASM 3 CP-1, contract scope reduction for Sections 50 & 57 Water Rehabilitation - Design/ESDC, and updated construction schedule due to previous gas main relocation delays for CP-3 Sections 23, 24, and 47 Design CA/RI. This underspending was partially offset by earlier land purchase than anticipated for the Tunnel Admin, Legal & Public Outreach, and timing of consultant work for Tunnel Redundancy Preliminary Design and MEPA Review and contractor work for the WASM/SPSM PRV construction.

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

Total FY22 CIP Budget of \$207,312

Construction Fund Management



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

Cash Balance as of 9/25/21	\$200.2million
Unused capacity under the debt cap:	\$1.88 billion
Estimated date for exhausting construction fund without new borrowing:	Apr-22
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding:	\$128 million
Commercial paper capacity / Revolving Loan	\$350 million
Budgeted FY22 Cash Flow Expectancy*:	\$186 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

1st Quarter – FY22

Source Water – Microbial Results

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

Sample Site: Quabbin Reservoir

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

All samples collected during the 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.**

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.

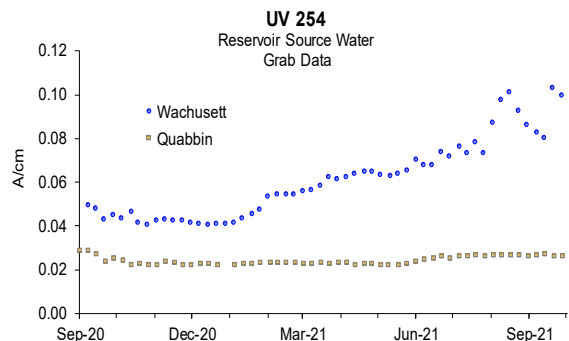
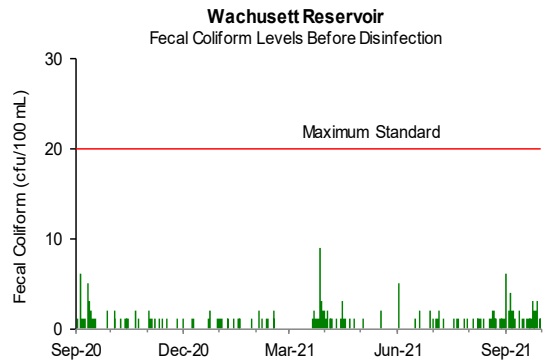
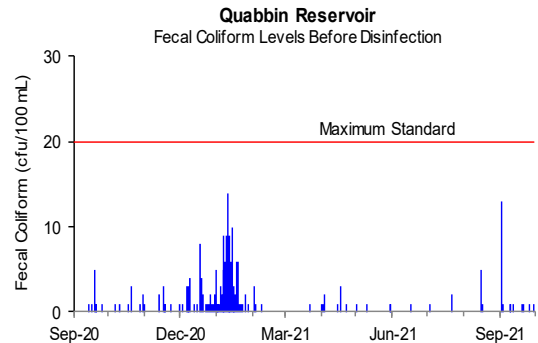
All samples collected during the 1st Quarter were below 20 cfu/100mL. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

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 averaged 0.026 A/cm for the quarter.

Wachusett Reservoir UV-254 levels averaged 0.087 A/cm for the quarter.



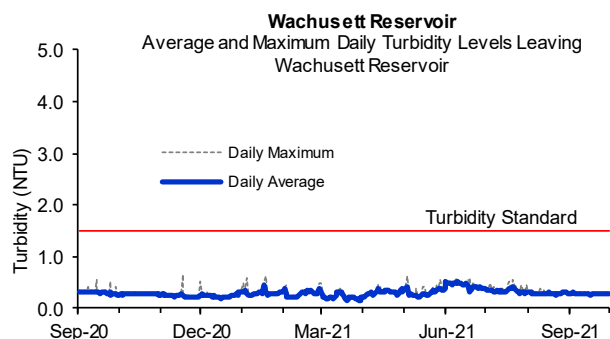
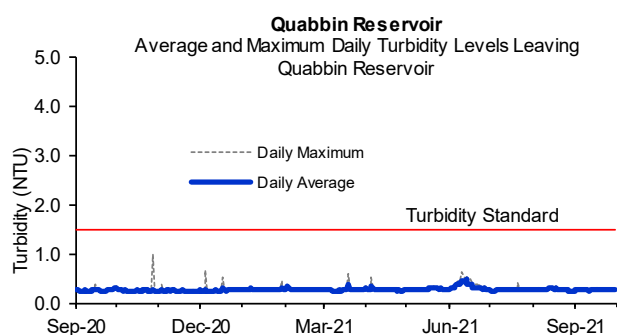
Source Water – Turbidity

1st Quarter – FY22

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

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

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

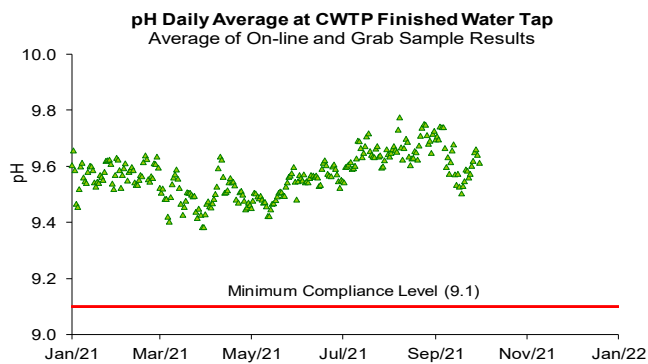
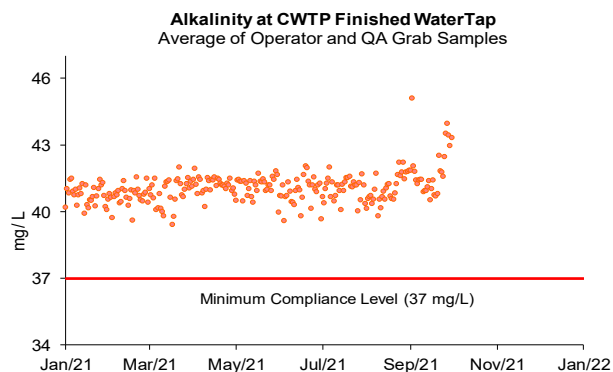


Treated Water – pH and Alkalinity Compliance

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

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

Quarterly distribution system samples were collected over a course of two weeks in September. Distribution system sample pH ranged from 9.1 to 9.6 and alkalinity ranged from 39 to 42 mg/L. No sample results were below DEP limits for this quarter.



Treated Water – Disinfection Effectiveness

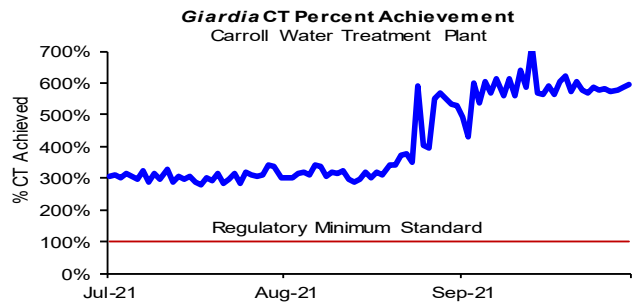
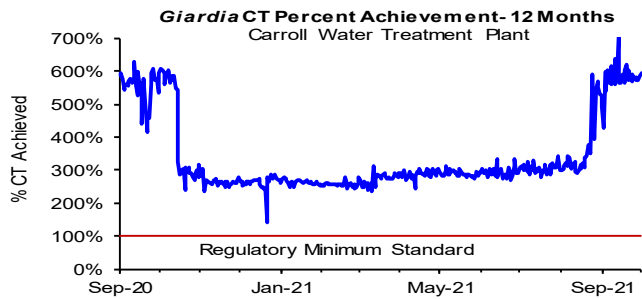
1st Quarter – FY22

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.

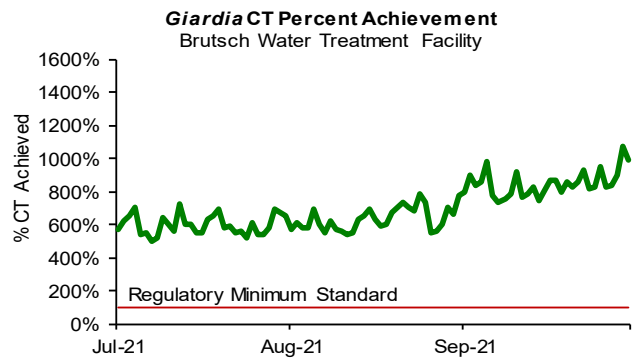
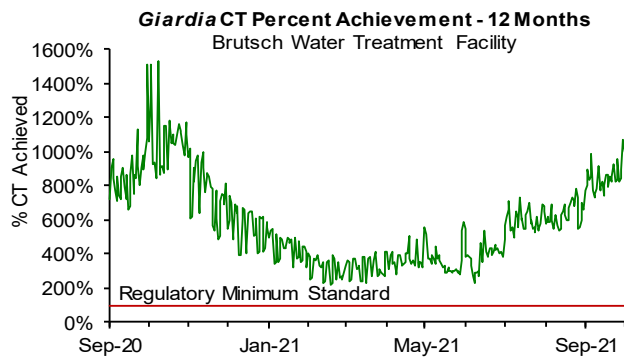
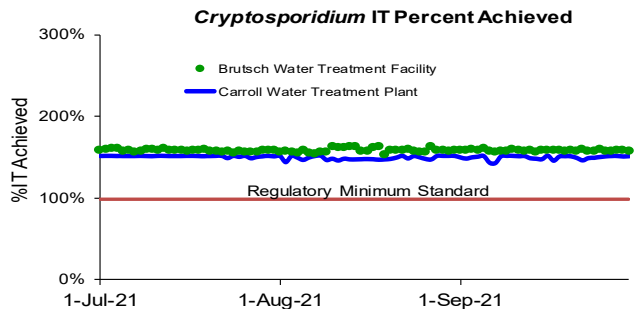
Wachusett Reservoir – MetroWest/Metro Boston Supply:

- Ozone dose at the CWTP varied between 2.5 to 4.3 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% for the quarter. Off-spec water was less than 5%.
- The ozone dose was proactively raised in 2020 from mid August to mid October in response to elevated reservoir total coliform levels. This is visible in the top left graph.
- The slight dip in *Giardia* CT Achievement on December 21, 2020 was due to Train B returning to service after undergoing winter maintenance. *Giardia* CT Achievement was met this day. This is visible in the top left graph.
- The ozone target was increased in mid-August 2021 in an effort to reduce chlorine demand and decay, as chlorine residuals have declined in the distribution system.



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

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal target of 0.75 - 0.85 mg/L (November 1 – May 31) and 0.85 - 1.05 mg/L (June 1 – October 31) at Ludlow Monitoring Station.
- The chlorine dose at BWTF varied between 1.70 to 1.80 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% for the quarter. Off-spec water was less than 5%.



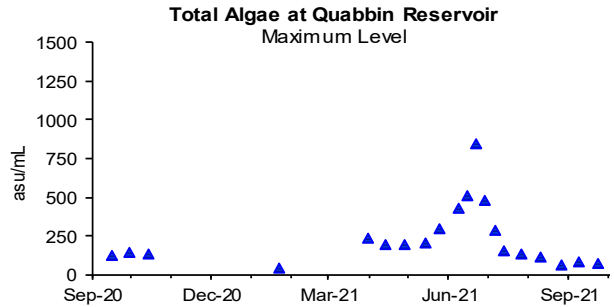
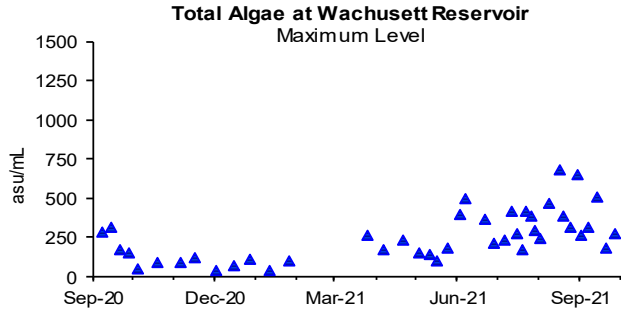
Source Water - Algae

1st Quarter – FY22

Algae levels in the Wachusett and Quabbin 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 reservoirs 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, there were no complaints which may be related to algae reported from the local water departments.



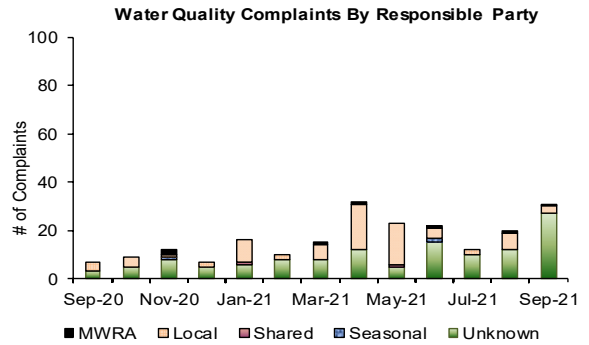
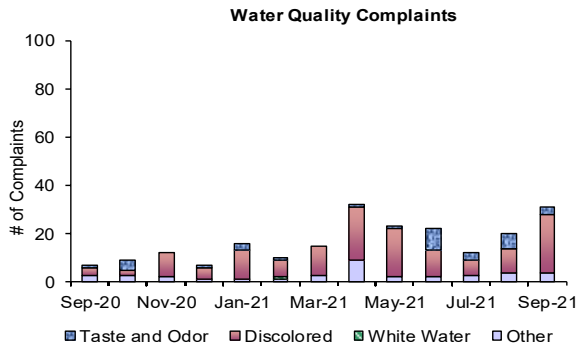
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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

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

Communities reported 63 complaints during the quarter compared to 33 complaints from 1st Quarter of FY20. Of these complaints, 40 were for "discolored water", 12 were for "taste and odor", and 11 were for "other". Of these complaints, 12 were local community issues, 2 were MWRA related, 1 was a shared MWRA/community issue, and 49 were unknown in origin.

- On September 16, Medford reported eleven discolored water complaints which may have been related to a valve activation when water demand increased in the area.



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

1st Quarter – FY22

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

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

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

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

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

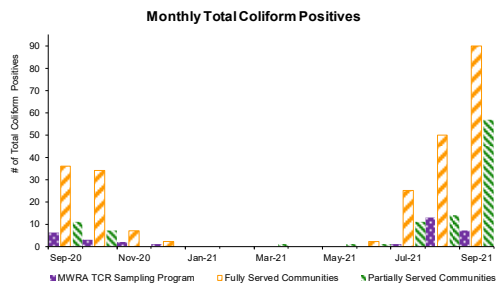
A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

Highlights

In the 1st Quarter, two hundred and forty-five of the 7,051 samples (3.47% system-wide) submitted to MWRA labs for analysis tested positive. Thirteen communities were required to perform a Level Assessment. (Canton, Chicopee, Needham, Somerville, South Hadley, Winthrop – July; Bedford, Chelsea, Somerville, Winthrop– August; Bedford, Everett, Medford, Norwood, Stoneham, Wakefield, Winchester, Winthrop - September). Twenty-eight of the 2029 MWRA locations or Community/MWRA Shared samples (1.38%) tested positive for total coliform. In September, seven samples were discounted by DEP in Boston due to demonstration that the positives were not representative of the distribution system. No samples tested positive for *E.coli*. Only 1.6% of the Fully Served community samples had chlorine residuals lower than 0.2 mg/L for the quarter.

NOTES:

- MWRA total coliform and chlorine residual results include data from community locations. In most cases these community results are indicative of MWRA water as it enters the community system; however, some are strongly influenced by local pipe conditions. Residuals in the MWRA system are typically between 1.0 and 2.8 mg/L.
- The number of samples collected depends on the population served and the number of repeat samples required.
- These communities are partially supplied, and may mix their chlorinated supply with MWRA chloraminated supply.
- Part of the Chicopee Valley Aqueduct System. Free chlorine system.
- Wakefield's sample collection for September was extended through October 1 due to a repeat sampling event.



		Total Coliform		E.coli Positive	# Assessment Required	
		# Samples (b)	# (%) Positive			
MWRA	MWRA Locations	406	2 (0.49%)	0		
	Shared Community/MWRA sites	1623	26 (1.60%)	0		
	Total: MWRA	2029	28 (1.38%)	0	No	
	ARLINGTON	167	0 (0%)	0		
	BELMONT	104	0 (0%)	0		
	BOSTON	855	20 (2.34%)	0	No	
	BROOKLINE	223	0 (0%)	0		
	CHELSEA	187	7 (3.74%)	0	Yes	
	DEER ISLAND	52	0 (0%)	0		
	EVERETT	181	6 (3.31%)	0	Yes	
	FRAMINGHAM	240	1 (0.42%)	0	No	
	LEXINGTON	118	0 (0%)	0		
	LYNNFIELD	18	0 (0%)	0		
	MALDEN	240	2 (0.83%)	0	No	
	MARLBOROUGH	75	0 (0%)	0		
	MARLBOROUGH	126	0 (0%)	0		
	MEDFORD	226	9 (3.98%)	0	Yes	
	MELROSE	123	2 (1.63%)	0	No	
	MILTON	102	0 (0%)	0		
	NAHANT	30	0 (0%)	0		
	NEWTON	279	1 (0.36%)	0	No	
	NORTHBOROUGH	51	1 (1.96%)	0	No	
	NORWOOD	111	6 (5.41%)	0	Yes	
	QUINCY	341	1 (0.29%)	0	No	
	READING	140	0 (0%)	0		
	REVERE	180	0 (0%)	0		
	SAUGUS	104	0 (0%)	0		
	SOMERVILLE	285	14 (4.91%)	0	Yes	
	SOUTHBOROUGH	30	0 (0%)	0		
	STONEHAM	107	6 (5.61%)	0	Yes	
	SWAMPSCOTT	56	0 (0%)	0		
	WALTHAM	222	2 (0.90%)	0	No	
	WATERTOWN	123	1 (0.81%)	0	No	
	WESTON	45	0 (0%)	0		
	WINTHROP	140	81 (57.86%)	0	Yes	
	Total: Fully Served	5281	161 (3.15%)			
Partially Served	BEDFORD	114	58 (50.88%)	0	Yes	
	BURLINGTON	145	0 (0%)	0		
	CANTON	93	2 (2.15%)	0	Yes	
	NEEDHAM	132	3 (2.27%)	0	Yes	
	PEABODY	205	0 (0%)	0		
	WAKEFIELD (a)	169	8 (4.73%)	0	Yes	
	WELLESLEY	120	2 (1.67%)	0	No	
	WILMINGTON	87	0 (0%)	0		
	WINCHESTER	100	6 (6.00%)	0	Yes	
	WOBURN	198	1 (0.51%)	0	No	
		Total: Partially Served	1363	80 (5.87%)		
	CVA	MWRA CVA Locations	105	1 (0.95%)	0	No
		CHICOPEE	186	0 (0%)	0	
SOUTH HADLEY FD1		70	3 (4.29%)	0	Yes	
WILBRAHAM		46	0 (0%)	0		
		Total: CVA	407	4 (0.75%)		
	Total: Community Samples	7051	245 (3.47%)			

Chlorine Residuals in Fully Served Communities

	2020				2021								
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
% <0.1	0.3	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.7
% <0.2	1.0	1.1	1.4	0.4	0.2	0.1	0.0	0.0	0.0	0.2	0.7	1.3	2.8
% <0.5	4.1	5.1	3.7	2.5	1.9	2.5	0.2	0.3	0.2	0.6	2.6	6.0	12.3
% <1.0	10.7	12.2	9.3	5.3	3.6	2.5	1.5	2.0	1.0	2.1	8.6	17.3	27.9
% ≥1.0	89.4	87.8	90.7	94.7	96.5	97.6	98.5	98.0	99.0	97.9	91.4	82.7	72.1

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

1st Quarter – FY22

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.

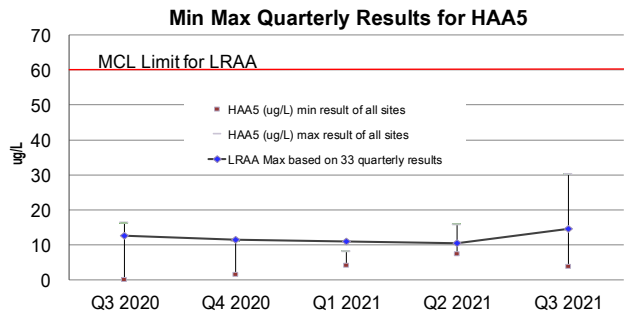
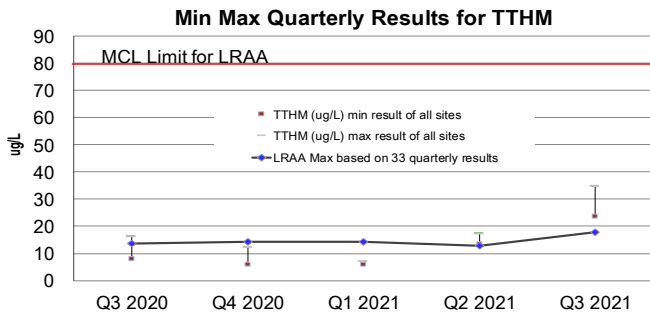
The locational running annual average calculated quarterly at each individual sampling location must be below the Total HAA5 or Total TTHM MCL standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

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 data for all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1). Each community is regulated individually.

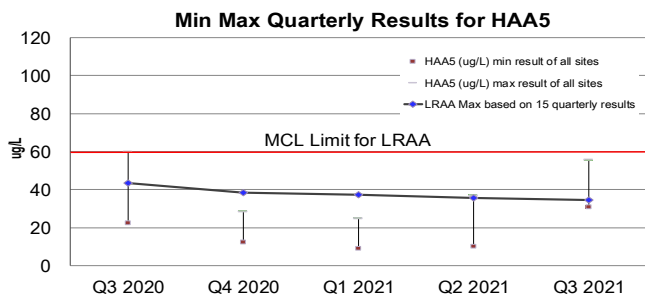
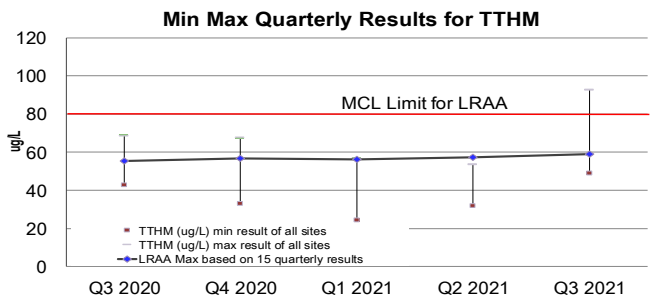
Bromate is tested monthly as required for water systems that treat with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA’s RAA MCL standard for bromate is 10 µg/L.

The LRAA for TTHMs and HAA5s for MWRA’s Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 19.5 µg/L; HAA5s = 14.5 µg/L. The current RAA for Bromate = 0.0 µg/L. No LRAA exceedances or violations occurred this quarter for MetroBoston and any of the CVA communities. MWRA and the CVA communities continue to closely monitor and manage the disinfection process to minimize DBP production.

MetroBoston Disinfection By-Products



CVA Disinfection By-Products (Combined Results)



Water Supply and Source Water Management

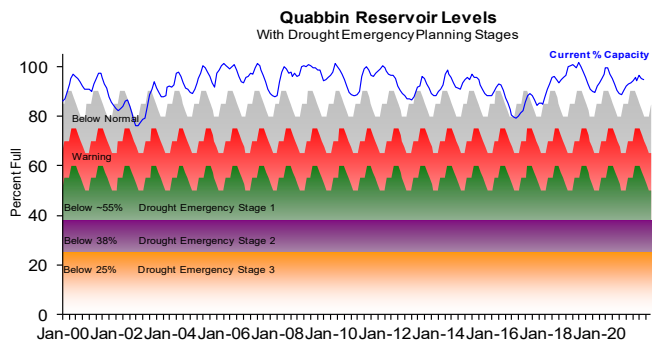
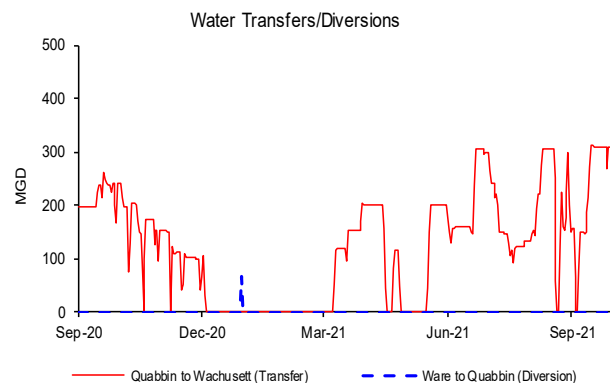
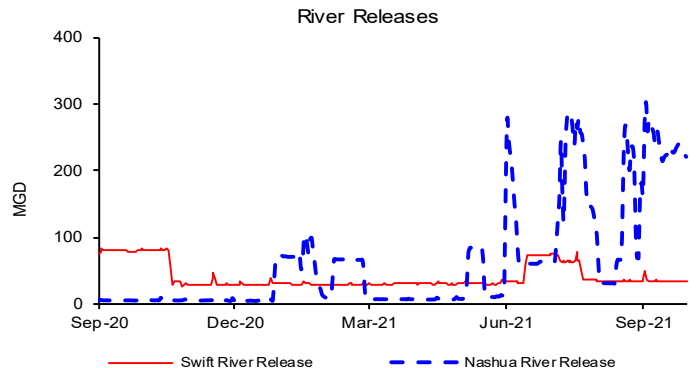
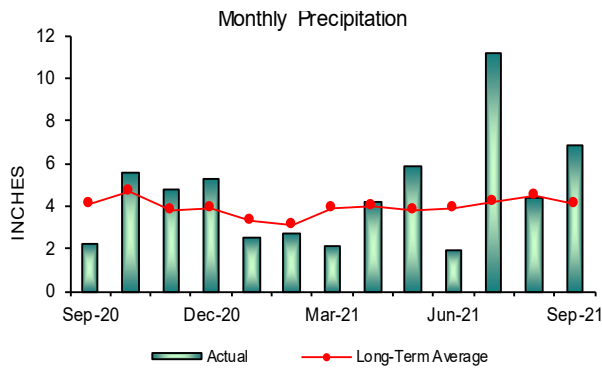
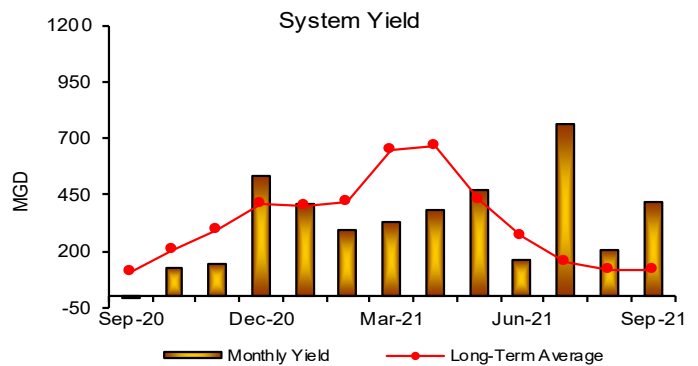
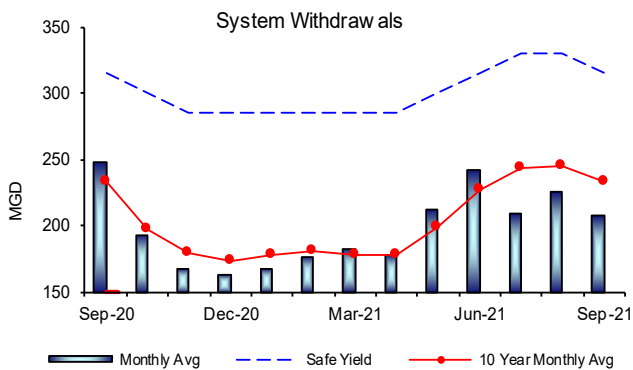
1st Quarter – FY22

Background

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

Outcome

The volume of the Quabbin Reservoir was at 94.9% as of September 30, 2021; a 0.80 % increase for the quarter, which represents a gain of more than 3.1 billion gallons of storage and an increase in elevation of 0.41'. System withdrawal for the quarter was below its long term average. Yield and precipitation for the quarter were above their respective long term quarterly averages. Quabbin is in Normal Operating Range for this time of year.



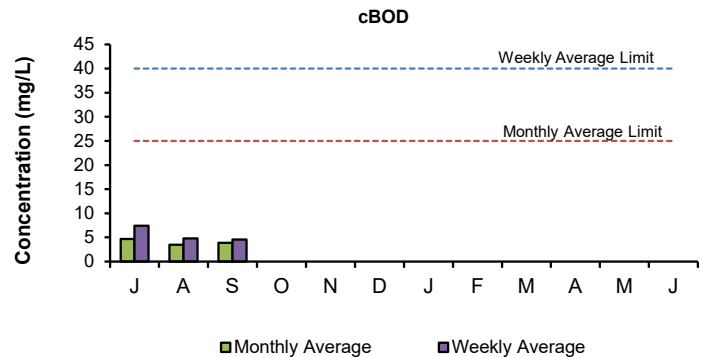
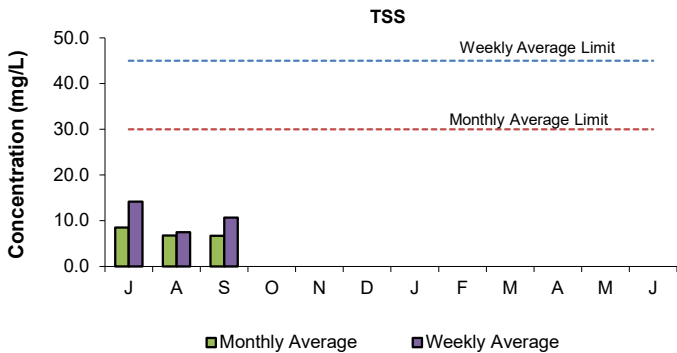
WASTEWATER QUALITY

NPDES Permit Compliance: Deer Island Treatment Plant 1st Quarter - FY22

NPDES Permit Limits

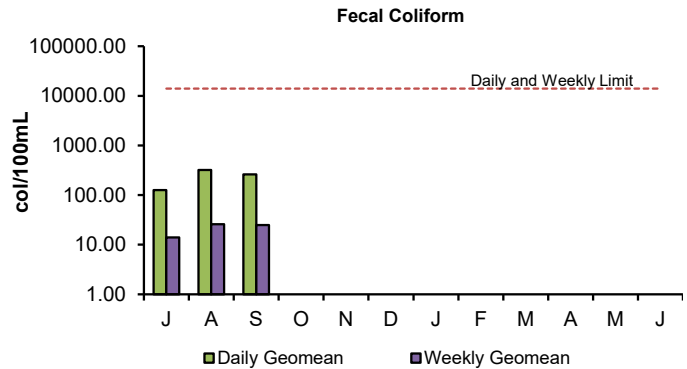
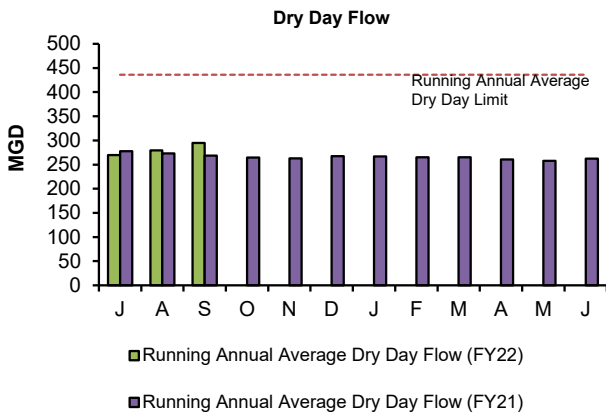
Effluent Characteristics	Units	Limits	July	August	September	1st Quarter Violations	FY22 YTD Violations	
Dry Day Flow (365 Day Average):	mgd	436	269.9	279.6	294.7	0	0	
cBOD:	Monthly Average	mg/L	4.7	3.5	3.9	0	0	
	Weekly Average	mg/L	7.4	4.8	4.6	0	0	
TSS:	Monthly Average	mg/L	8.5	6.8	6.7	0	0	
	Weekly Average	mg/L	14.2	7.5	10.7	0	0	
TCR:	Monthly Average	ug/L	456	0.0	0.0	0	0	
	Daily Maximum	ug/L	631	0.0	0.0	0	0	
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	126.0	320.0	260.0	0	0
	Weekly Geometric Mean	col/100mL	14000	14.0	26.0	25.0	0	0
	% of Samples >14000	%	10	0.0	2.2	0.0	0	0
	Consecutive Samples >14000	#	3	0	1	0	0	0
pH:	SU	6.0-9.0	6.2-6.9	6.5-7.0	6.5-6.9	0	0	
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED		0	0	
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	100	100	100	0	0
	Inland Silverside	%	≥1.5	100	100	100	0	0

There have been no permit violations in FY22 to date at the Deer Island Treatment Plant (DITP).



Total Suspended Solids (TSS) in the effluent is a measure of the amount of solids that remain suspended after treatment. All TSS measurements for the 1st Quarter were within permit limits.

Carbonaceous Biochemical Oxygen Demand (cBOD) is a measure of the amount of dissolved oxygen required for the decomposition of organic materials in the environment. All cBOD measurements for the 1st Quarter were within permit limits.



Running Annual Average Dry Day Flow is the average of all dry weather influent flows over the previous 365 days. The Dry Day Flow for the 1st Quarter was well below the permit limit of 436 MGD.

Fecal Coliform is an indicator for the possible presence of pathogens. The levels of these bacteria after disinfection show how effectively the plant is inactivating many forms of disease-causing microorganisms. In the 1st Quarter, all permit conditions for fecal coliform were met.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant
1st Quarter - FY22

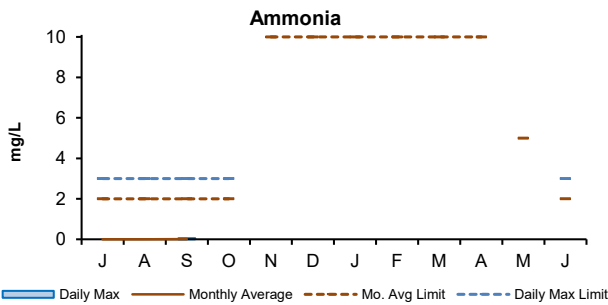
NPDES Permit Limits

Effluent Characteristics		Units	Limits	July	August	September	1st Quarter Violations	FY22 YTD Violations
Flow:	12-month Rolling Average:	mgd	3.01	2.50	2.60	2.83	0	0
BOD:	Monthly Average:	mg/L	20	0.10	0.70	0.50	0	0
	Weekly Average:	mg/L	20	0.60	0.90	1.10	0	0
TSS:	Monthly Average:	mg/L	20	1.50	1.50	1.20	0	0
	Weekly Average:	mg/L	20	2.00	1.60	1.70	0	0
pH:		SU	6.5-8.3	6.9-7.4	7-7.7	6.9-7.6	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	8.60	8.40	8.40	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	7	5	6	0	0
	Daily Geometric Mean:	cfu/100mL	409	28	10	69	0	0
TCR:	Monthly Average:	ug/L	17.6	0.00	0.00	0.00	0	0
	Daily Maximum:	ug/L	30.4	0.00	0.00	0.00	0	0
Copper:	Monthly Average:	ug/L	11.6	8.63	7.39	7.41	0	0
	Daily Maximum:	ug/L	14.0	8.63	7.39	8.48	0	0
Total Ammonia Nitrogen: November 1st - March 31st	Monthly Average:	mg/L	10.0	0.00	0.00	0.01	0	0
	Daily Maximum:	mg/L	35.2	0.00	0.00	0.05	0	0
Total Phosphorus: November 1st - March 31st	Monthly Average:	ug/L	1000	28	46	27	0	0
	Daily Maximum:	ug/L	RPT	58	93	49	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

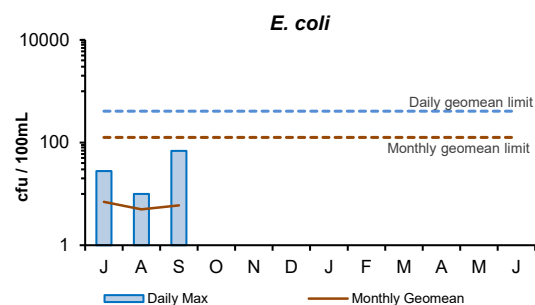
There have been no permit violations at the Clinton Treatment Plant in FY22.

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

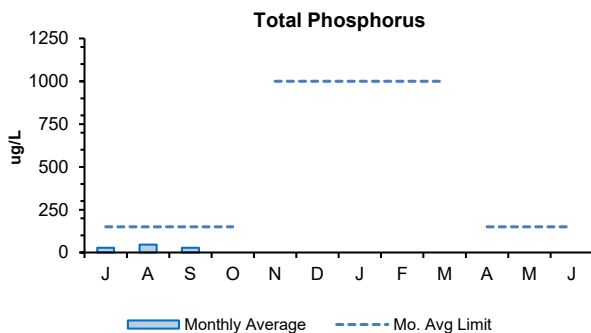
+ Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



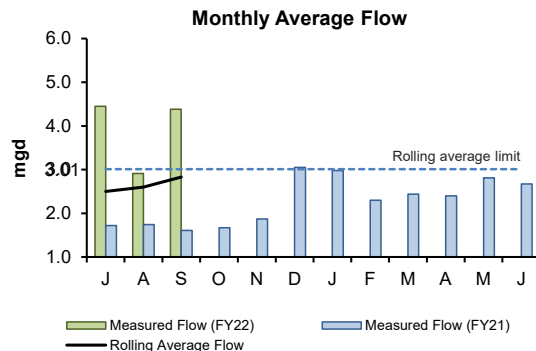
The 4th Quarter's monthly average and daily maximum concentrations of ammonia were below the permit limits. The monthly average and daily maximum limits for the 1st Quarter are 2.0 and 3.0 mg/L respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.



E. coli is an indicator for the possible presence of pathogens. There were no violations of permit limits in the 1st Quarter. The monthly and daily limits are 126 cfu/100 mL and 409 cfu/100 mL respectively.



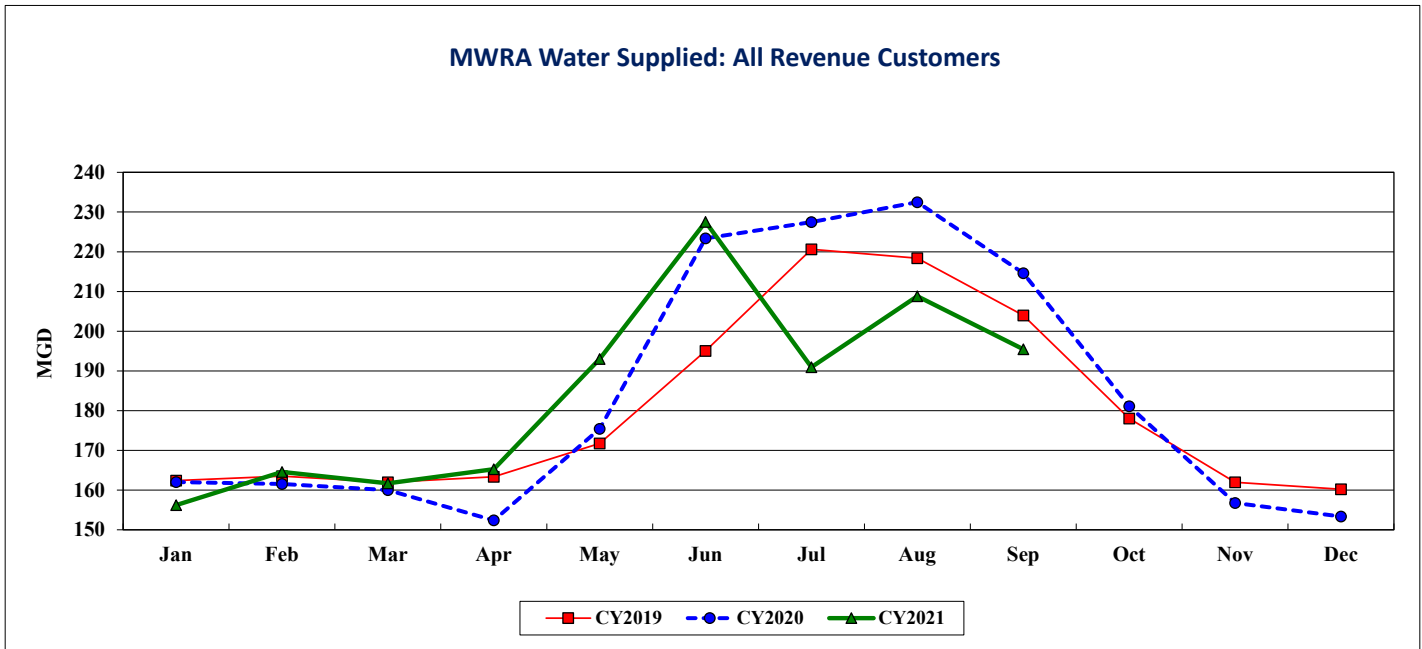
Total phosphorus limits are most stringent during the growing season from April to October. The 1st Quarter's monthly average concentrations for total phosphorus were below permit limits.



The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The 12-month rolling average flows during the 1st Quarter were below the permit limit.

COMMUNITY FLOWS AND PROGRAMS

Customer Water Use 1st Quarter - FY22



MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2019	162.37	163.49	161.98	163.35	171.77	195.02	220.62	218.38	204.00	178.00	161.94	160.21	184.75	180.22
CY2020	162.02	161.55	160.02	152.37	175.43	223.40	227.45	232.50	214.62	181.11	156.73	153.37	190.06	183.46
CY2021	156.21	164.57	161.70	165.28	193.00	227.52	190.93	208.80	195.48				184.93	184.93

The September 2021 Community Water Use Report was recently distributed to communities served by the MWRA Metropolitan and Chicopee Valley 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 2021 water use will be used to allocate the FY2023 water utility rate revenue requirement.

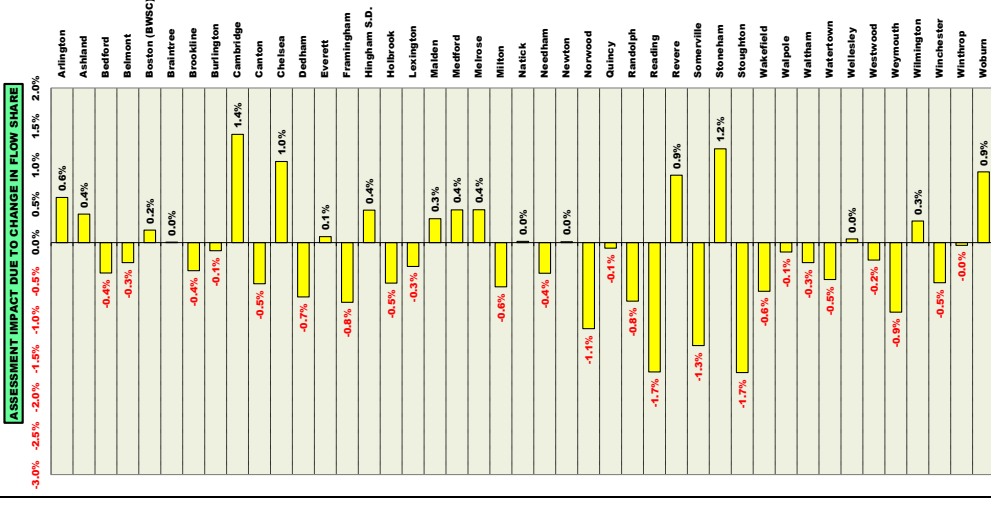
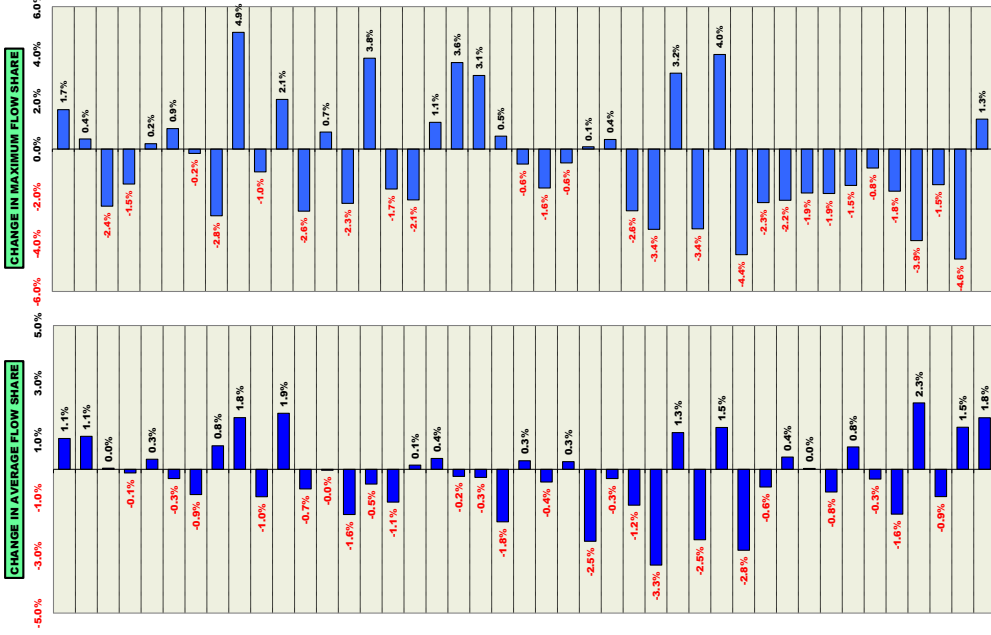
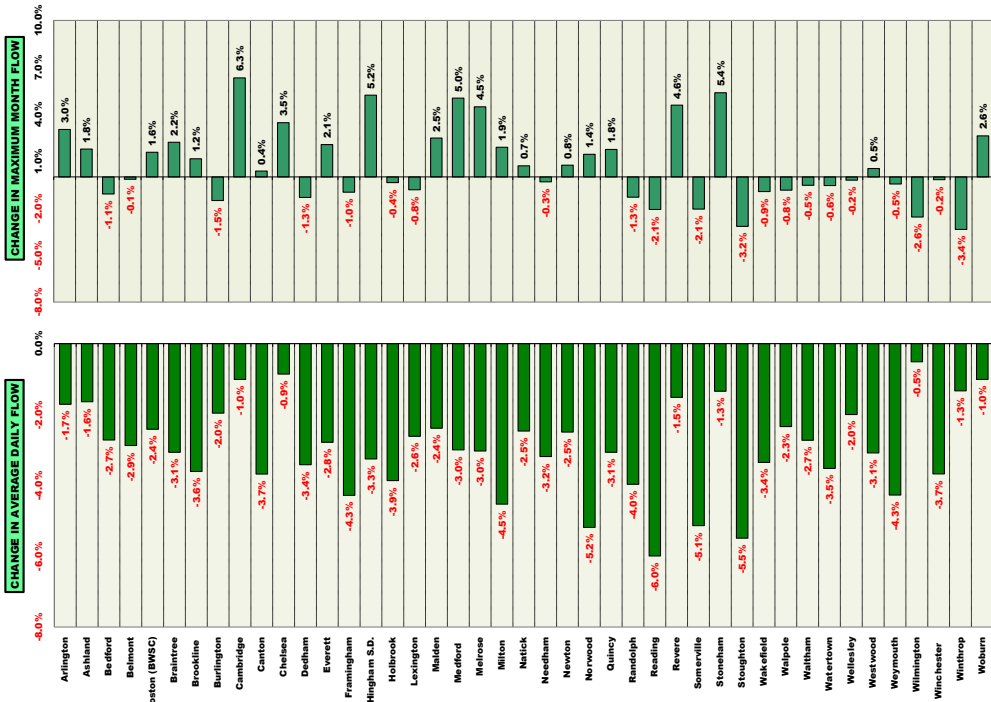
MWRA customers used an average of 198.4 mgd in the 1st quarter (Jul-Sep 2021) of FY2022. This is a decrease of 26.5 mgd or 11.8% compared to the 1st quarter of FY2021.

Community Wastewater Flows

1st Quarter - FY22

How CY2019-21 Community Wastewater Flows Could Effect FY2023 Sewer Assessments

The flow components of FY2023 sewer assessments will be calculated using a 3-year average of CY2019 to CY2021 wastewater flows compared to FY2022 assessments that will use a 3-year average of CY2018 to CY2020 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 CY2019 to CY2021 flow share compared to CY2018 to CY2020 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

¹ MWRA uses a 3-year flow average to calculate sewer assessments. Three-year averaging smooths the impact of year-to-year changes in community flow share, but does not eliminate the long-term impact of changes in each community's relative contribution to the total flow.
² Based on actual flows for 2018 and 2019, and January to March, and June to December 2020. April & May 2020 based on the average of three prior years, adjusted for 2020 water use. January to December 2021 estimate based on the average of the three prior years.
³ Flow data is preliminary and subject to change pending additional MWRA and community review.
⁴ Represents ONLY the impact on the total BASE assessment resulting from the changes in average and maximum wastewater FLOW SHARES.

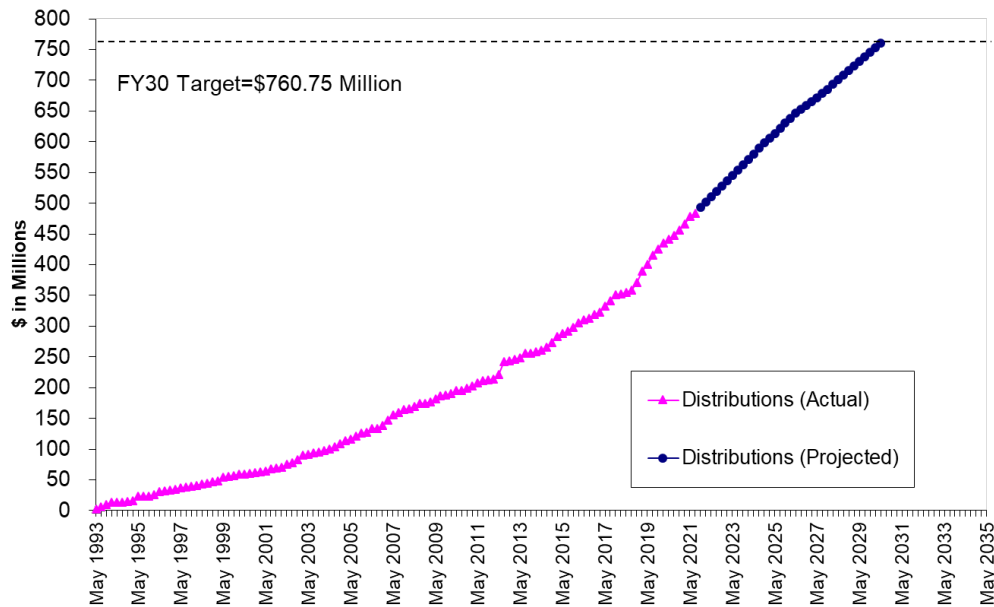
Community Support Programs

1st Quarter – FY22

Infiltration/Inflow Local Financial Assistance Program

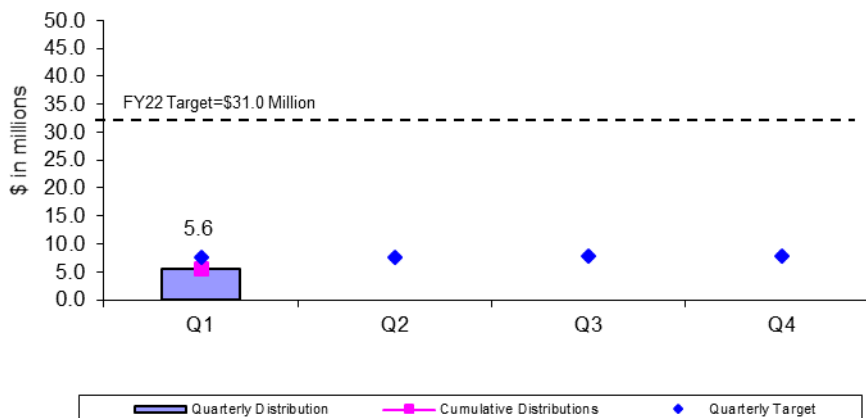
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides \$760.75 million in grants and interest-free loans (average of about \$20 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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 through 12 funds (total \$360 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period. Phase 13 provides an additional \$100 million in ten-year loan-only funds.

I/I Local Financial Assistance Program Distribution FY93-FY30



During the 1st Quarter of FY22, \$5.6 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Arlington, Bedford, Chelsea, Milton, Natick and Westwood. Total grant/loan distribution to date for FY22 is \$5.6 million. From FY93 through the 1st Quarter of FY22, all 43 member sewer communities have participated in the program and \$484 million has been distributed to fund 635 local I/I reduction and sewer system rehabilitation projects. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY22 Quarterly Distributions of Sewer Grant/Loans



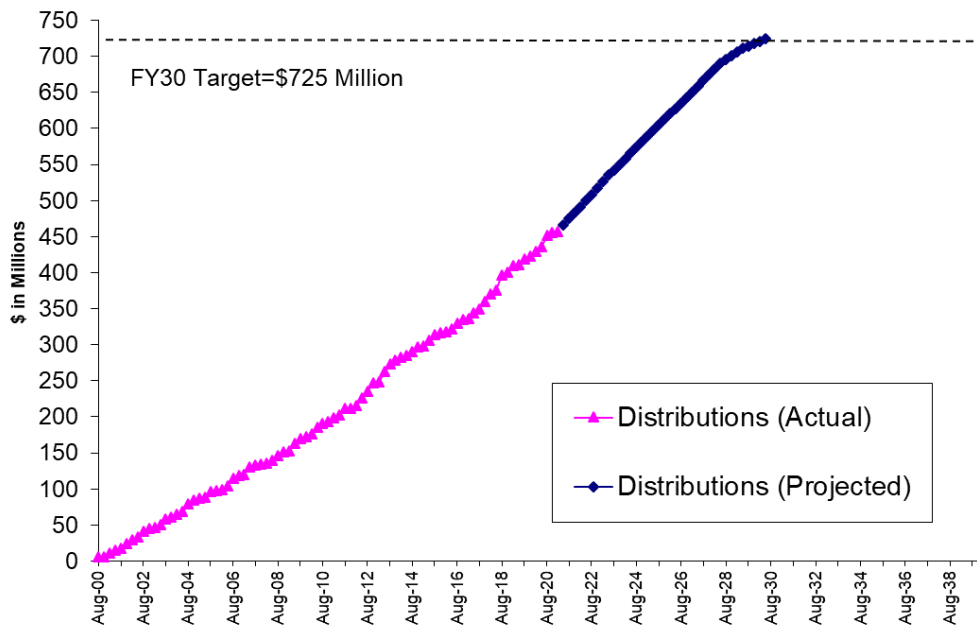
Community Support Programs

1st Quarter – FY22

Local Water System Assistance Program

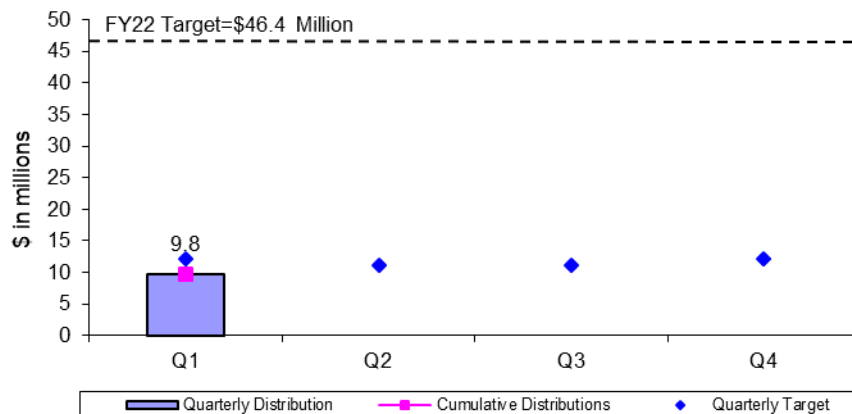
MWRA's Local Water System Assistance Programs (LWSAP) provides \$725 million in interest-free loans (an average of about \$24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have been 3 phases: Phase 1 at \$222 Million, Phase 2 at \$210 Million, and Phase 3 at \$293 Million. Eligible project costs include: water main cleaning/lining, replacement of unlined water mains, lead service replacements, valve, hydrant, water meter, tank work, engineering design, engineering services during construction, etc. MWRA partially-supplied communities receive pro-rated funding allocations based on their percentage use of MWRA water. Interest-free loans are repaid to MWRA over a ten-year period beginning one year after distribution of the funds. The Phase 1 water loan program concluded in FY13 with \$222 million in loan distributions. The Phase 2 - LWSAP continues distributions through FY23. The Phase 3 Water Loan Program is authorized for distributions FY18 through FY30.

Local Water System Assistance Program Distribution FY01-FY30



During the 1st Quarter of FY22, \$9.8 million in interest-free loans was distributed to fund local water projects in Belmont, Canton, Chelsea, Medford, Newton, Norwood, Reading, and Woburn. Total loan distribution to date for FY22 is \$9.8 million. From FY01 through the 1st Quarter of FY22, \$476 million has been distributed to fund 490 local water system rehabilitation projects in 43 MWRA member water communities. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY22 Quarterly Distributions of Water Loans



Community Support Programs

1st Quarter – FY22

Lead Service Line Replacement Loan Program

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

FY17 was the first year of the Lead Service Line Replacement Loan Program – MWRA made three Lead Loans.

FY18 was the second year of the Lead Loan Program - MWRA made five Lead Loans.

FY19 was the third year of the Lead Loan Program - MWRA made four Lead Loans.

FY20 was the fourth year of the Lead Loan Program - MWRA made eight Lead Loans.

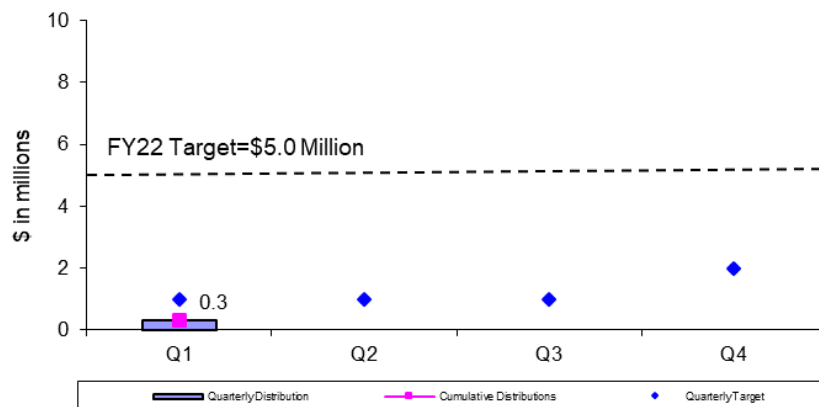
FY21 is the fifth year of the Lead Loan Program – MWRA made seven Lead Loans.

FY22 is the sixth year of the Lead Loan Program – MWRA made one Lead Loan in the first quarter.

Summary of Lead Loans:

Chelsea in FY22	\$0.3 Million	Winthrop in FY18	\$0.3 Million
Watertown in FY21	\$0.6 Million	Marlborough in FY18	\$1.0 Million
Marlborough in FY21	\$2.0 Million	Newton in FY17	\$4.0 Million
Everett in FY21	\$1.5 Million	Quincy in FY17	\$1.5 Million
Boston in FY21	\$2.6 Million	<u>Winchester in FY17</u>	<u>\$0.5 Million</u>
Winthrop in FY21	\$0.8 Million	TOTAL	\$25.5 Million
Chelsea in FY21	\$0.3 Million		
Winchester in FY21	\$0.6 Million		
Everett in FY20	\$0.5 Million		
Marlborough in FY20	\$1.0 Million		
Winchester in FY20	\$0.6 Million		
Winthrop in FY20	\$0.7 Million		
Weston in FY20	\$0.2 Million		
Everett in FY20	\$1.0 Million		
Somerville in FY20	\$0.9 Million		
Chelsea in FY20	\$0.3 Million		
Marlborough in FY19	\$1.0 Million		
Winthrop in FY19	\$0.5 Million		
Chelsea in FY19	\$0.1 Million		
Everett in FY19	\$1.0 Million		
Needham in FY18	\$1.0 Million		
Winchester in FY18	\$0.5 Million		
Revere in FY18	\$0.2 Million		

FY22 Quarterly Distributions of Lead Service Line Replacement Loans

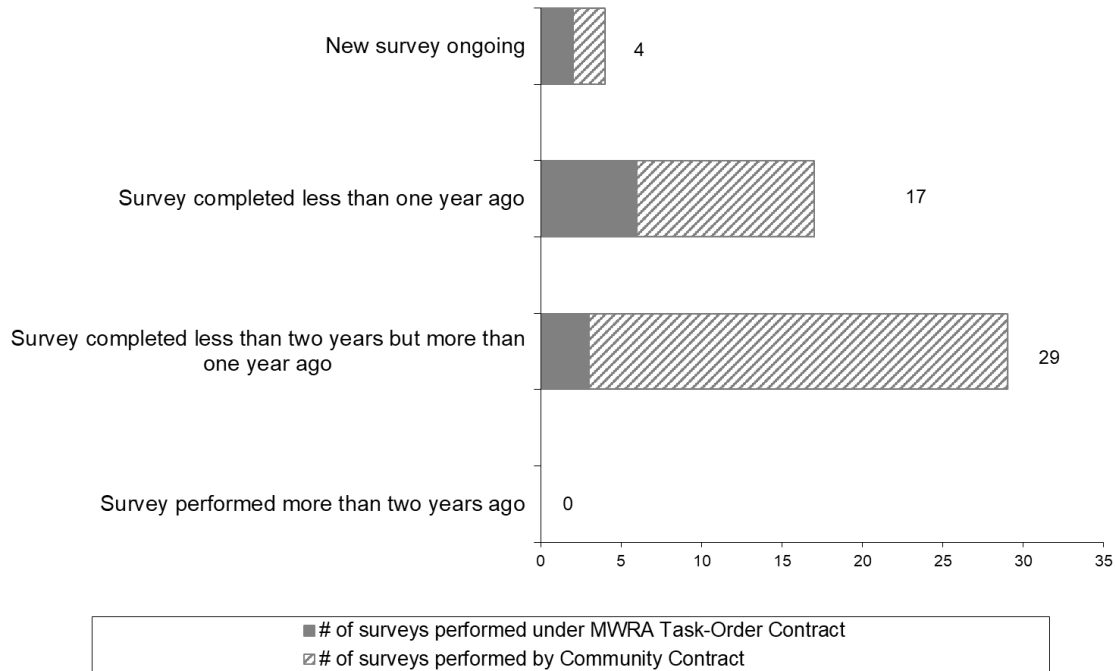


Community Support Programs

1st Quarter – FY22

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 FY22, 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 200 mgd. The local Water Conservation Program includes distribution of water conservation education brochures (indoor - 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	719				719
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	1,060				1,060
Toilet Leak Detection Dye Tablets	_____	1,325				1,325

BUSINESS SERVICES

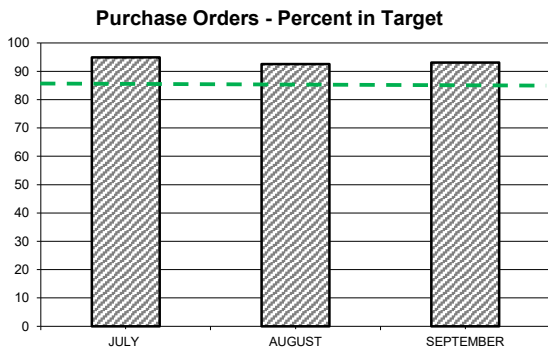
Procurement: Purchasing and Contracts

1st Quarter - FY22

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

Outcome: Processed 93% of purchase orders within target; Average Processing Time was 4.75 days vs. 3.85 days in Qtr 1 of FY21. Processed 33% (4 of 12) of contracts within target timeframes; Average Processing Time was 207 days vs. 217 days in Qtr 1 of FY21.

Purchasing



	No.	TARGET	PERCENT IN TARGET
\$0 - \$500	561	3 DAYS	89.8%
\$500 - \$2K	573	7 DAYS	96.3%
\$2K - \$5K	445	10 DAYS	95.9%
\$5K - \$10K	48	25 DAYS	89.5%
\$10K - \$25K	39	30 DAYS	87.1%
\$25K - \$50K	6	60 DAYS	50.0%
Over \$50K	25	90 DAYS	100.0%

The Purchasing Unit processed 1697 purchase orders, 396 less than the 2093 processed in Qtr 1 of FY21 for a total value of \$14,524,801 versus a dollar value of \$8,763,760 in Qtr 1 of FY21.

The purchase order processing target was not met for the \$25K - \$50K category due to modifications to the original quote as a result of scope changes.

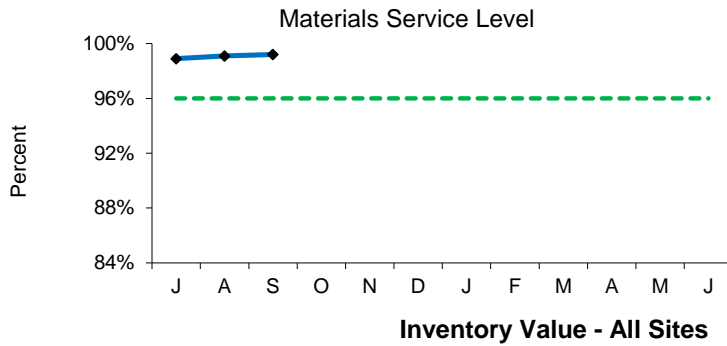
Contracts, Change Orders and Amendments

Procurement executed twelve contracts with a value of \$60,583,372 and eight amendments with a value of \$882,100. Twelve change orders were executed during the period. The dollar value of all non-credit change orders during Qtr 1 of FY22 was \$836,050 and the value of credit change orders was (\$341,211).

Eight contracts were not executed within the target timeframes. One contract was delayed as it was originally bid as two technical assistance contracts, however, only one proposal was received and subsequently awarded. The second needed to be re-advertised resulting in additional delays. Several contracts were delayed due to staff summary requirements. A fourth contract was delayed due to questions regarding bid pricing and estimates. A fifth contract was delayed due to delays associated with processing administrative and post award submittals after the bid deadline. A sixth contract was delayed due to the need to extend the evaluation phase of the procurement in order to gather and check additional firm references. A seventh contract was delayed due to specification review which took longer than anticipated and delays processing the certificates of insurance. The final contract was delayed as it was originally bid as a two-step procurement, however, the bid process had to be restructured due to no submittals. In addition, security issues also contributed to additional requirements and subsequent delays.

Staff reviewed 40 proposed change orders and 23 draft change orders.

Materials Management 1st Quarter - FY22



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 6,270 (99.2%) of the 6,330 items requested in Q1 from the inventory locations for a total dollar value of \$1,286,372.

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 FY22 goal is to reduce consumable inventory from the July '21 base level (\$8.7 million) by 2.0% (approximately \$175,120), to \$8.5 million by June 30, 2022.

Items added to inventory this quarter include:

- Deer Island – air, fuel and oil filters for Fleet Services; flowmeter batteries and heating coil pre-filters for Liquid Train; pressure switches and flowmeters for I&C; circuit breakers, current limiters, coolant, air and oil filters for Power & Pump.
- Chelsea –conveyor roller for Metro Maintenance; ink cartridges for MIS and Procurement.
- Southboro - poison ivy skin cleanser for Grounds and Maintenance; padlocks for all trades; oil filters for Fleet Services.

Property Pass Program:

- Eleven audits were conducted during Q1.
- Scrap revenue received for Q1 amounted to \$14,292. Year to date revenue received amounted to \$14,292.
- Revenue received from online auctions held during Q1 amounted to \$368,402. Year to date revenue received amounted to \$368,402.

Items	Base Value July-21	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,756,035	8,703,803	-52,232
Spare Parts	9,317,998	9,229,452	-88,546
Total	18,074,033	17,933,255	-140,778

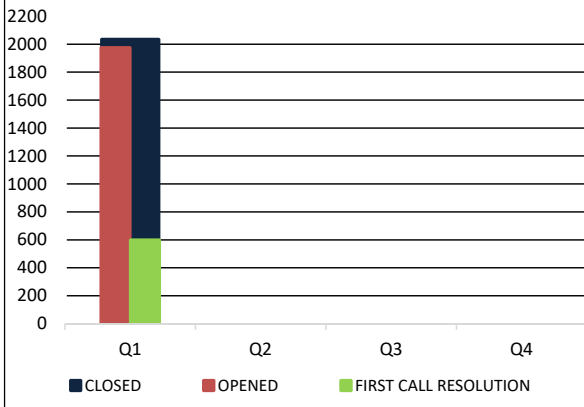
Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

MIS Program

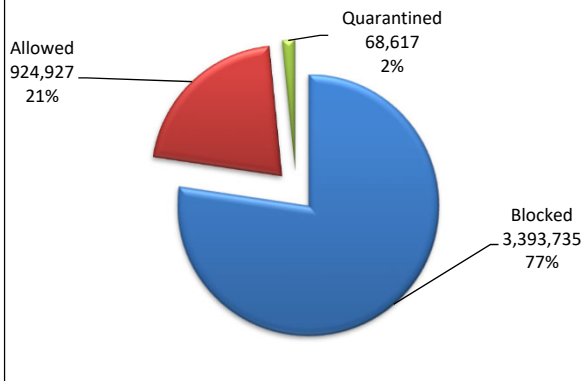
First Quarter – FY22

Numbers & Statistics

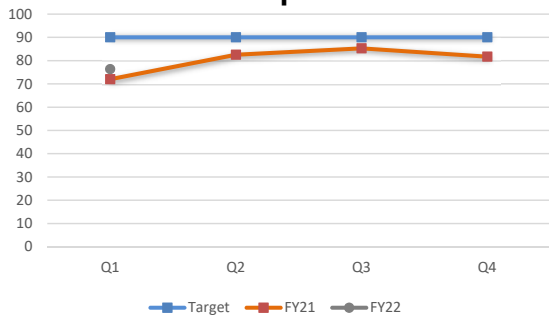
Monthly Call Volume



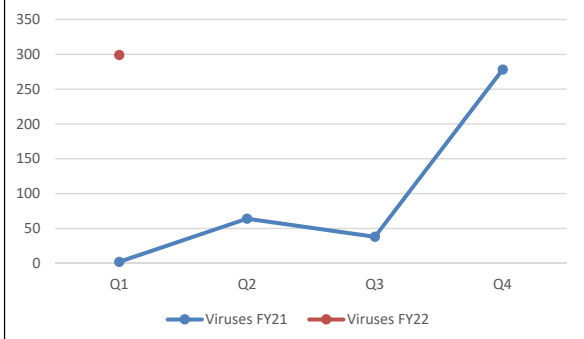
Emails Received: 4,387,279



PC Compliance



Viruses Caught by McAfee



Project Updates

Infrastructure & Security

AWIA Risk and Resiliency Assessment: Remediation work to resolve vulnerabilities continued. At the end of the quarter, 66% of the identified tasks were “Completed”; 1% were “In Progress”; and 33% were identified as longer term projects.

Cyber Security Awareness Training: At the end of the Q1, 853 (99.9%) of the assigned 854 employees had completed their assignments. 66% of the additional 254 Water and Wastewater staff that do not use computers regularly had completed their training.

Identity and Access Management: Purchase of a single sign-on (SSO) solution, which is required for the Lawson upgrade to Infor CloudSuite, the Infor Learning Management System, the PBX Replacement project, and other cloud-based Software-as-a-Service applications, was completed and will be implemented during Q2.

PBX (Telephone System) Upgrade: Bid was awarded to ePlus; Planning for the installation, configuration, and roll-out of the new phones began. Cabling and other required infrastructure upgrades continued through Q4 and will complete in Q1 FY22.

Design Services for the Requirements of the Next Managed Security Services Contract: This project was substantially complete, both Phase 1 and Phase 2, during this quarter. MWRA awaits final reports and deliverables in early Q2.

Other Software & Custom Applications

Vaccination Attestation Application: Successfully rolled out a home-built web application that allows MWRA employees to submit vaccination status. Currently working on adding a telephone submission option.

Visitor Management: A soft go-live with just the guards was successful followed by a full go-live in September.

ECM/Electronic Document Management: Held multiple meetings with vendor on records management, departmental files structures, and began to review E&C Use Cases. Continued to explore standardization of documentation processes and folder hierarchies across Engineering, Construction, DI-TIC and DISC. Continued to refine and document technical infrastructure design and plan for stress testing and disaster recovery.

Learning Management System: Created and developed associations between catalogs, learning paths, courses and certifications. Continued functional testing in preparation for User Acceptance Testing. Continued configuring certificates and licenses programs functionality and distribution lists. Documenting formal User Acceptance Test plan.

MWRA Website Replacement: Selection committee identified and first selection committee meeting held. Procurement process underway and advertisement targeted for October.

Library, Record Center, & Training

Library: Undertook 20 research requests, supplied 25 books for circulation, provided 15 articles, and 97 standards. The MWRA Library Portal supported 845 end-user searches. Research topics include Philadelphia CSO Control and green infrastructure, NPDES Fecal Coliform Limit dilution factor, historic plans of Sudbury Reservoir land.

Record Center (RC): The Record Center added 121 new boxes, handled 243 total boxes, and shredded 10 onsite, 65 gallon bins of confidential documentation. The RC performed 38 database/physical box searches for various departments, which saved the delivery of 20 boxes. Research included: various contracts, BHP documents, Case files for Law and infrastructure related items. Staff are involved in on-going Enterprise Content Management meetings to replace our Record Management application.

Training: In Q1, 73 online IT lessons were taken, by 16 employees, spanning 132 hours. Live training class development began for Administrative staff, which will begin in October. Classes completed in Q1 included: One Outlook class and two Excel classes.

Legal Matters

1st Quarter - FY22

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits:** Reviewed seventy-two (72) 8(m) permits.
- **Real Property:** Drafted 8(m) permit for the City of Quincy for the use of MWRA's parcel of land located off Cleverly Court in Quincy, an 8(m) permit for the University of Wisconsin for the use of certain lands near MWRA's Weston and Norumbega Reservoirs and Weston Aqueduct in Weston to study white tailed deer, an 8(m) permit for DCR path near Weston Aqueduct and Shaft 5 in Weston relative to funding for DCR Boathouse Bridge Project over Charles River, Newton/Weston, and an 8(m) permit denial letter for activities proposed on Sudbury Aqueduct land in the area of 1058 and 1062 Beacon Street in Newton. Drafted license for MIT Lincoln Laboratories for the use of certain portions of DITP to perform testing of a passive camera system. Drafted legislation authorizing MWRA to grant its parcel of land located at Cleverly Court in Quincy to the City of Quincy and drafted the related conveyance deed. Drafted Offer of Acceptance and Purchase Offer, Purchase and Sale Agreement, Quitclaim Deed, and Land Damage and Settlement Agreement for 167-175, and 2, 4 & 5 Mack's Court, Waltham for property acquisition and "friendly" taking to support MWRA's Metropolitan Water Tunnel Program. Reviewed property rights for Section 89 Waterline Replacement Project for MWRA Contract 7117. Drafted SNDA and estoppel certificate for 2 Griffin Way, Chelsea. Reviewed MWRA sewer easement taking and construction drawings for the Framingham Sewer Extension Project (1995) and drafted response letter regarding the review of the private way located at Leach Lane, Natick. Prepared title summary for appraisal review for property at 425 Waverley Oaks Road, Waltham. Reviewed proposed MWRA water and sewer easements at former Suffolk Down site. Reviewed MWRA's property rights in the areas of Hollywood Drive and Evelyn Road in Newton, property rights along Eastern Avenue and Griffin Way in Chelsea for anticipated traffic light signal project, and property rights at MWRA's Chelsea Creek Headworks. Prepared Guide and Maps for MWRA's property rights in the areas of the Hultman Aqueduct and I90/I95. Reviewed Order of Conditions for Mystic Reservation in Medford, Hatch Shell Area. Researched MWRA's property rights in the areas of I90/I95 and prepared map. Reviewed title documents in Waltham for property interest acquisition to support MWRA's Metropolitan Water Tunnel Program.
- **Energy:** Reviewed and analyzed Hydroelectric Production Incentive Program under section 242 of the Energy Policy Act of 2005, and applicability to MWRA Loring Road hydro facility. Prepared revisions to Interconnection Service Agreements for Oakdale hydro and Charlestown wind turbine facilities.
- **Environmental/NPDES:** Reviewed NPDES permit renewal letter for MWRA's Clinton Wastewater Treatment Plant. Assisted staff with MEPA comment letter regarding the proposed Tri-Town Water Treatment Plant in Braintree, MA and potential concerns with PFAS discharge to MWRA sewer system. Assisted ENQUAL staff in preparation of comments to EPA Region One on the draft NPDES permit for the Chicopee, MA wastewater treatment plant and related facilities. Assisted ENQUAL staff regarding EPA request for additional sampling for the Clinton WWTP NPDES permit renewal application.
- **Miscellaneous:** Reviewed MCLE language related to MWRA's drinking water supply. Reviewed and revised Town of Ashland Water Supply Contract with MWRA. Reviewed draft AUL for Chelsea Creek Headworks Facility. Prepared PCB deed notice for Chelsea Creek Headworks building.
- **Public Records Requests:** During the first quarter of FY22, MWRA received and responded to one hundred and forty-five (145) public records requests.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

One demand for arbitration was filed.

Matters Concluded

Received a notice of dismissal from the Massachusetts Commission Against Discrimination (MCAD) finding a lack of probable cause that the legitimate, nondiscriminatory reasons offered by the MWRA for bypassing the Complainant for a promotional opportunity in 2018 were pretext for religious-based discrimination.

LITIGATION/CLAIMS

New lawsuits/claims: (Employee) v. MWRA et al, Suffolk Superior Court C.A. 21-CV-01434: Plaintiff filed a lawsuit against MWRA and another asserting claims under G.L. c. 151B of harassment, discrimination and retaliation and seeking damages.

Abdessamad Marah – Motor Vehicle Claim: Claimant seeks \$20,000 in damages for alleged bodily injury and property damages arising out of an August 11, 2020 motor vehicle accident between Claimant and an MWRA vehicle on Eastern Avenue in Chelsea.

Closed Cases: Kilgannon v. Boston Water Sewer Commission, et als. 21 MISC 000240 (MDV): On July 13, 2021, the Court entered judgment in favor of Plaintiff, the owner of real property located at 16 Courtney Road, West Roxbury, after no parties claimed any right to an easement referenced on a 1914 plan of the subject property but not otherwise recorded with the Registry of Deeds. This land court action is now closed.

Significant Developments

In re Mercedes-Benz Emissions Litigation, United States District Court for the District of New Jersey; 16-cv-881 (KM) (ESK): MWRA filed a claim with respect to a previously owned fleet vehicle in a class action lawsuit related to Mercedes-Benz or Sprinter Blue TEC II Diesel Vehicles that may be eligible for either cash payment, emissions modifications and/or extended warranty.

(Employee) v. MWRA: Superior Court C.A. No. 16-3708E: The Court held a final Pre-Trial Conference and scheduled a trial date of May 17, 2022.

DiGregorio, et al. v. Griffin Way, LLC v. MWRA, C.A. No. 20-02429-K A motion to approve a settlement in the amount of \$400,000 is currently pending before the Superior Court.

Closed Claims: Zoila Granados, and her two minor children MVA Claim: MWRA paid claimant in settlement of her claim that she and her two children sustained injuries in a motor vehicle accident involving an MWRA vehicle that occurred on Route 16 in Revere in April 2018. This matter is now closed.

Contract No. S578, Thermal and Hydro Power Plant Maintenance. MWRA entered into a Settlement Agreement with the Contractor to resolve a dispute related to the loss of the nose cone and resultant shroud damage on Hydro Turbine Generator No. 2 at the Deer Island Treatment Plant during maintenance of the equipment under Contract No. S578.

Subpoenas

During the First Quarter of FY 2022, two subpoenas were received; one of which was closed within the same First Quarter.

Wage Garnishments

There are two wage garnishment matters that are active and monitored by Law Division.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of Sept 2022	As of June 2021	As of March 2021
Construction/Contract/Bid Protest (other than BHP)	0	1	1
Tort/Labor/Employment	3	4	4
Environmental/Regulatory/Other	3	2	2
Eminent Domain/Real Estate	1	0	0
Total	7	7	7
Other Litigation matters (restraining orders, etc.)	2	2	2
Total – all pending lawsuits	9	9	9
Claims not in suit:	1	1	1
1. Abdessamad Marah MVA Claim			
Bankruptcy	1	1	1
Wage Garnishment	2	2	2
TRAC/Adjudicatory Appeals	0	0	0
Subpoenas	1	0	0
TOTAL – ALL LITIGATION MATTERS	13	13	13

TRAC/MISC.**New Appeals:**

There were no new appeals in the 1st Quarter FY 2022.

Settlement by Agreement of Parties

There were no Settlements by Agreement of Parties in the 1st Quarter FY 2022.

Stipulation of Dismissal

No Stipulations of Dismissal were filed in 1st Quarter FY 2022.

Notice of Dismissal**Fine paid in full**

No Notices of Dismissal for Fines Paid in Full were filed in the 1st Quarter FY 2022.

Tentative Decision

No Tentative Decisions were issued in the 1st Quarter FY 2022.

Final Decisions

No Final Decisions were issued in the 1st Quarter FY 2022.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES 1st Quarter - FY22

Highlights

As a state Authority, the MWRA is allowed to leverage state level contracts to maximize favorable discounts negotiated by the Commonwealth. A review of office supply purchases resulted in a recovery of \$9,838 in overbillings. Upon further analysis by the vendor, appropriate billing processes were put in place to prevent ongoing billing errors.

Internal Audit reviewed the proposed tariff filing with the Massachusetts Department of Public Utilities and the HEEC cable costs as incurred. IA is supporting the MWRA effort to recover funds paid to the city of Cambridge for combined sewer overflow (CSO) project.

Several incurred cost audits (Kleinfelder Northeast, Inc., JCK Underground, Peer Consultants, P.C. and Corrosion Probe Inc.) are in process. IA also issued 11 indirect cost rate letters to consultants following a review of their consultant disclosure statements. Management advisory services included support on the MWRA's leases. An internal review of water and wastewater licenses and certifications is progressing.

Status of Recommendations

During FY22, 7 recommendations were closed.

IA follows-up on open recommendations on a continuous basis. All open recommendations have target dates for implementation. When a recommendation has not been implemented within 36 months, the appropriateness of the recommendation is re-evaluated.

All Open Recommendations Pending Implementation – Aging Between 0 and 36 Months

Report Title (issue date)	Audit Recommendations		
	Open	Closed	Total
Fuel Use & Mileage Tracking (12/31/18)	2	6	8
Asset Tracking – Fleet Data Verification (8/21/19)	1	15	16
Fleet Services Non-Plated Equipment Inspections (3/30/20)	8	7	15
Overhead Crane Inspections (4/28/21)	7	4	11
Compliance Status of Employees' Mandatory Confined Space Entry Training (6/30/21)	7	1	8
Total Recommendations	25	33	58

Cost Savings

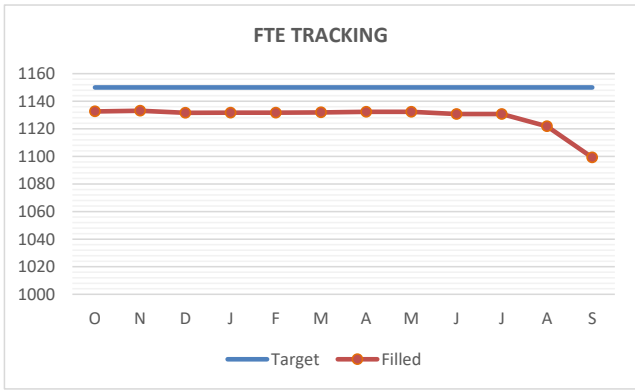
IA's target is to achieve at least \$1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

Cost Savings	FY18	FY19	FY20	FY21	FY22 Q1	TOTALS
Consultants	\$118,782	\$262,384	\$643,845	\$563,525	\$0	\$1,588,536
Contractors & Vendors	\$1,323,156	\$3,152,884	\$2,097,729	\$1,547,223	\$152,751	\$8,273,743
Internal Audits	\$204,202	\$210,063	\$212,517	\$214,458	\$63,670	\$904,910

OTHER MANAGEMENT

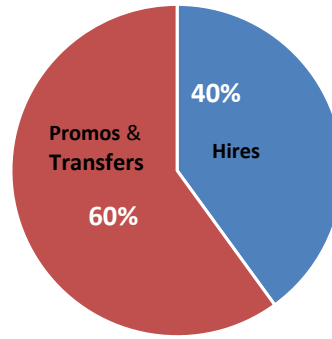
Workforce Management

1st Quarter - FY22

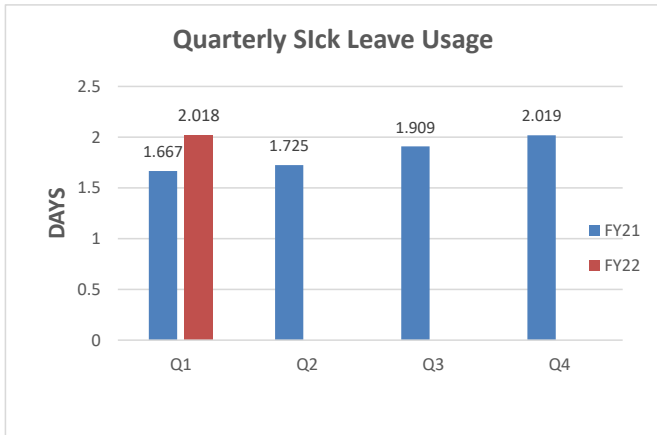


FY21 Target for FTE's = 1150
 FTE's as of September 2021 = 1099.2
 Tunnel Redundancy as of Sept 2021 = 12

Position Filled by Hires/Promos & Transfer for YTD



	Pr/Trns	Hires	Total
FY20	84 (59%)	58 (41%)	142
FY21	81 (56%)	64 (44%)	145
FY22	21 (60%)	14 (40%)	35

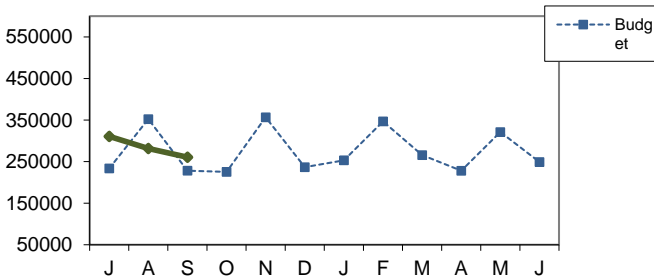


Average monthly sick leave for the 1st Quarter of FY22 has an increase as compared to the 1st Quarter of FY21 (2.018 from 1.667)

	Number of Employees	YTD (usage to date)	Annualized Total	Annual FMLA %	FY20
Admin	141	1.29	5.14	8.7%	5.87
Aff. Action	7	2.67	10.67	0.0%	3.14
Executive	4	0.57	2.27	0.0%	3.60
Finance	31	0.92	3.68	30.7%	3.17
Int. Audit	5	0.29	1.17	0.0%	0.89
Law	12	3.06	12.24	0.0%	5.83
OEP	4	0.88	3.50	0.0%	1.33
Operations	893	2.20	8.82	19.0%	7.95
Tunnel Red	12	0.57	2.28	37.9%	1.62
Pub. Affs.	12	1.22	4.86	0.0%	1.13
MWRA Avg	1121	2.69	8.07	17.8%	7.32

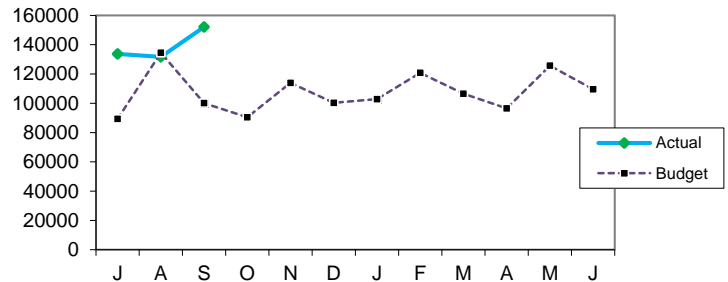
Percent of sick leave usage for FY22, attributable to Family and Medical Leave Act (FMLA) is 17.8% .

Field Operations Current Month Overtime \$



Total Overtime for Field Operations for the first quarter of FY22 was \$853k which is \$39k over budget. Emergency overtime was \$528k, which is \$113k over budget. Rain events totaled \$414k and Emergency Maintenance was \$68k. Coverage overtime was \$228k which is \$35k over budget, reflecting the month's shift coverage requirements. Planned overtime was \$97k or (\$108k) under budget with combined spending of \$52k for Maintenance, \$18k for Planned Ops and \$12k for Training.

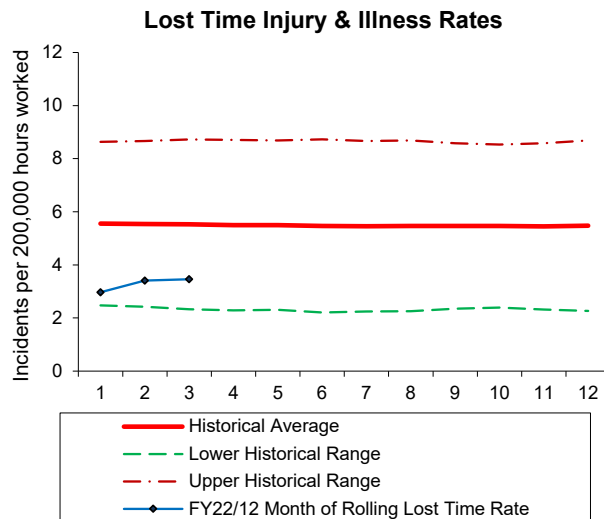
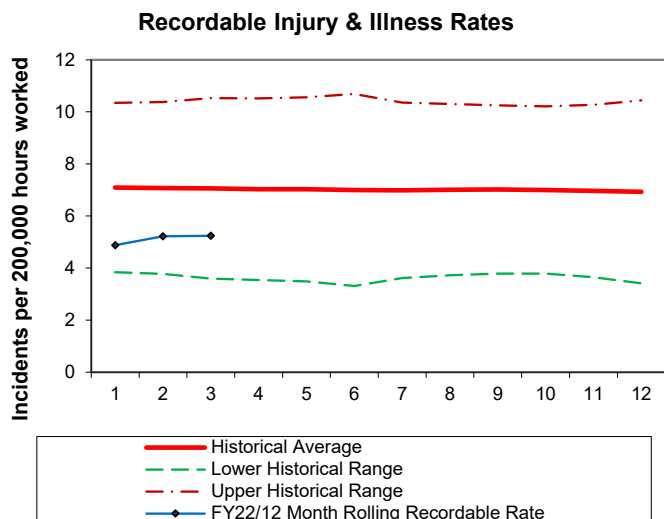
Deer Island Treatment Plant Current Month Overtime \$



Deer Island's total overtime expenditure first quarter was \$418K, which was \$94K or 28.9% over budget. In the first quarter, Deer Island experienced higher than anticipated storm coverage of \$75k and shift coverage of \$58k. This is offset by lower planned/unplanned overtime of (\$40K).

Workplace Safety

1st Quarter - FY22



- 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. Each month this rate is calculated using the previous 12 months of injury data.
- 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. Each month this rate is calculated using the previous 12 months of injury data.
- 3 The "Historical Average" is computed using the actual MWRA monthly incident rates for FY99 through FY22. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively.
- 4 With Changes in state law, in February 1, 2019, MWRA began record keeping and reporting according to Federal OSHA standards for injury and illness record keeping. Strictly adhering to the federal OSHA reporting regulation has caused an increase in recorded injuries and illnesses. This increase is causing both the Recordable injury and illness Rate and the Lost Time Injury and Illness rate to trend higher than in past years but does not necessarily mean there is an increase in injuries or illnesses. OSHA injuries and illnesses, and lost time are recorded differently than the Massachusetts Workers' Compensation standards and could result in an increase in the OSHA rate while the Workers' Compensation claims are decreasing. Over time, the rise on the charts should stabilize as new data replaces the older data..

WORKERS COMPENSATION HIGHLIGHTS

	4th Quarter Information		
	New	Closed	Open Claims
Lost Time	6	6	63
Medical Only	9	6	25
Report Only	12	12	
	QYTD		FYTD
Regular Duty Returns	5		5
Light Duty Returns	0		0
Indemnity payments as of September 30, 2021 included in open claims listed			18

COMMENTS:

Regular Duty Returns

July 2 Employees returned to full duty/no restrictions
August 2 Employees returned to full duty/no restrictions
September 1 Employees returned to full duty/no restrictions

Light Duty Returns

N/A July Aug Sep

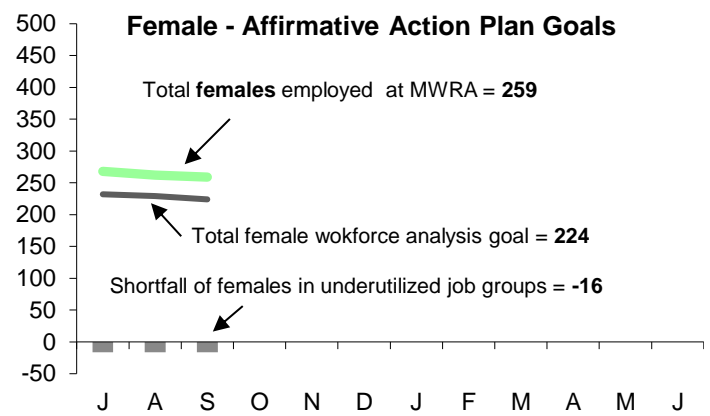
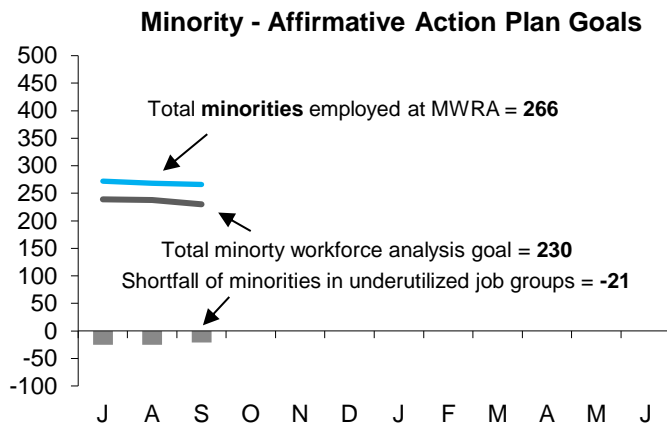
Note: Claims may initially be counted in one category and changed to another category at a later date.

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 - FY22



Highlights:

At the end of Q1 FY22, 5 job groups or a total of 21 positions are underutilized by minorities as compared to 5 job groups for a total of 28 positions at the end of Q1 FY21; for females 5 job groups or a total of 16 positions are underutilized by females as compared to 7 job groups or a total of 15 positions at the end of Q1 FY21. During Q1, 3 minorities and 1 female were hired. During this same period 2 minorities and 3 females were terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees	Minorities	Achievement	Minority	Females	Achievement	Female
	as of 9/30/2021	as of 9/30/2021	Level	Over or Under Underutilized	As of 9/30/2021	Level	Over or Under Underutilized
Administrator A	25	3	1	2	12	6	6
Administrator B	24	2	7	-5	8	5	3
Clerical A	23	8	4	4	21	17	4
Clerical B	23	8	6	2	3	7	-4
Engineer A	77	23	17	6	18	18	0
Engineer B	60	19	16	3	13	9	4
Craft A	111	16	21	-5	0	4	-4
Craft B	135	21	18	3	2	3	-1
Laborer	70	22	16	6	5	3	2
Management A	92	22	28	-6	34	19	15
Management B	42	11	9	2	8	10	-2
Operator A	60	5	8	-3	2	2	0
Operator B	69	20	9	11	3	2	1
Professional A	27	4	6	-2	16	12	4
Professional B	170	50	40	10	82	72	10
Para Professional	49	15	10	5	24	22	2
Technical A	55	15	13	2	7	12	-5
Technical B	6	2	1	1	1	1	0
Total	1118	266	230	57/-21	259	224	51/-16

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/ Transfers	AACU Ref. External	Position Status
Administrative B	Associate General Counsel	1	Ext.	0	0	NH = WM
Administrative B	Superintendent, Clinton	1	Ext.	0	0	NH = WM
Administrative B	Manager, Occup Health & Safety	1	Int./Ext.	1	0	Promo = WM
Craft A	Valve Maintenance Foreman	1	Int.	1	0	Promo = WM
Craft B	HVAC Specialist	1	Ext.	0	0	NH = WM
Craft B	Master Welder I	1	Ext.	0	0	NH = WM
Craft B	Plumber/Pipefitter	1	Ext.	0	0	NH = WM
Craft B	Medium Voltage Electrical Specialist	1	Int.	1	0	Promo = WM
Craft B	Facilities Specialist I	1	Int.	1	0	Promo = WM
Management A	Manager, Operations	1	Ext.	0	0	NH = WM
Management B	IT Security Analyst	1	Int./Ext.	0	0	NH = HM
Management B	Operations Supervisor	1	Int.	1	0	Promo = WM
Operators A	Area Supervisor	1	Int./Ext.	1	0	Promo = WM
Professional A	Community Relations Coordinator	1	Int.	1	0	Promo = WM
Technical A	Field Supervisor	1	Int.	1	0	Promo = WM

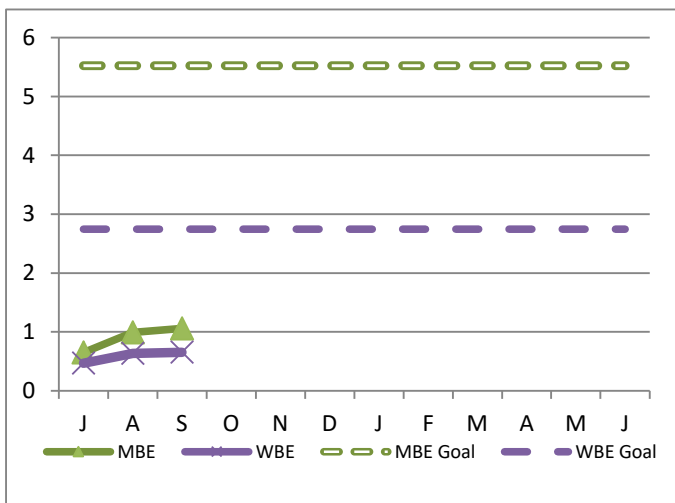
MBE/WBE Expenditures

1st Quarter - FY22

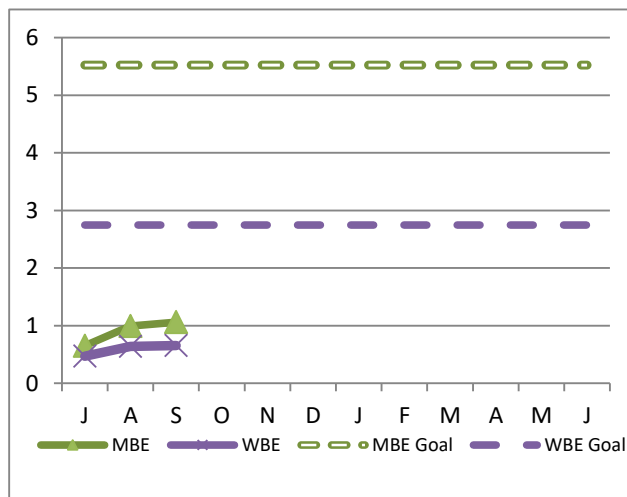
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY22 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they have no MBE/WBE spending goals.

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

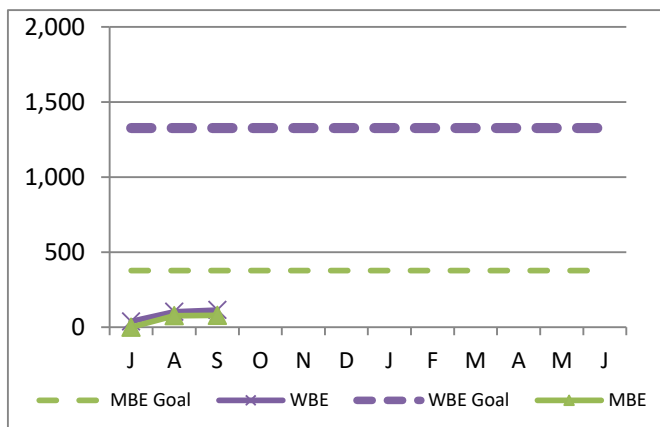
Construction



Professional Services



Goods/Services



FY22 spending and percentage of goals achieved, as well as FY21 performance are as follows:

MBE			
FY22 YTD		FY21	
Amount	Percent	Amount	Percent
1,059,822	19.2%	4,234,355	51.6%
585,715	27.3%	2,439,855	107.0%
78,993	21.0%	403,728	113.2%
1,724,530	21.4%	7,077,938	65.3%

WBE			
FY22 YTD		FY21	
Amount	Percent	Amount	Percent
654,251	23.8%	3,238,772	79.3%
245,014	14.2%	554,298	30.3%
113,803	8.6%	528,645	40.9%
1,013,068	17.5%	4,321,715	60.0%

Construction
Prof Svcs
Goods/Svcs
Totals

FY22 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

MWRA FY22 CEB Expenses through 1st Quarter – FY22

As of September 2021, total expenses are \$181.8 million, \$9.1 million or 4.8% lower than budget, and total revenue is \$203.5 million, \$901k or 0.4% over budget, for a net variance of \$10.0 million.

Expenses –

Direct Expenses are \$54.9 million, \$5.9 million or 9.7% under budget.

- **Wages & Salaries** are \$2.6 million under budget or 10.0%. Regular pay is \$2.6 million under budget, due to lower head count, and timing of backfilling positions. YTD through September, the average Full Time Equivalent (FTE) positions was 1,135, thirty-two fewer than the 1,167 FTE's budgeted.
- **Ongoing Maintenance** expenses are \$1.2 million under budget or 15.5%, primarily due to the timing of projects.
- **Chemicals** expenses are \$575k under budget or 15.7%, primarily due to under spending for Hydrogen Peroxide of \$214k, Activated Carbon of \$166k, Polymer \$80k, and Soda Ash of \$78k.
- **Fringe Benefits** expenses are \$510k under budget or 8.9%, primarily due to lower headcount.
- **Professional Services** expenses are \$391k under budget or 17.5%, primarily due to under spending for Computer System Consultant of \$195k, Engineering \$175k, and Legal expense of \$69k.
- **Workers Compensation** expenses are \$318k under budget or 48.7%, primarily due to under spending for Compensation Payments of \$199k and Medical Payments of \$94k. Due to uncertainties of when spending will happen, the budget is spread evenly throughout the year.
- **Utilities** expenses are \$223k under budget or 3.5%, primarily due to underspending on diesel, \$1.1 million due to timing of fuel delivery to Deer Island which will begin in October. Partially offset by over spending for Electricity of \$939k due to higher flows at Deer Island which accounted for \$650k of the electricity variance. Other wastewater pumping accounted for overspending of \$210k in electricity spending. Deer Island purchased 14.5% more kWh than planned as plant flows were 63.1% over budget due to wet weather events. Higher electricity prices also contributed to the spending variance.

Indirect Expenses are \$18.1 million, \$345k or 1.9% under budget. Underspending is driven by lower Watershed Reimbursement of \$212k and Insurance payments of \$100k.

Capital Finance Expenses totaled \$108.9 million, \$2.9 million or 2.6% under budget, reflecting lower than budgeted variable interest expense.

Revenue and Income –

Total Revenue and Income is \$203.5 million, or \$901k over budget. Other Revenue was \$834k over budget, reflecting Miscellaneous Revenue of \$454k and gains on the disposal of equipment of \$358k. Other User Charges were \$111k over budget.

	Sep 2021 Year-to-Date			
	Period 3 YTD Budget	Period 3 YTD Actual	Period 3 YTD Variance	%
EXPENSES				
WAGES AND SALARIES	\$ 25,446,880	\$ 22,889,640	\$ (2,557,240)	-10.0%
OVERTIME	1,271,277	1,434,033	162,756	12.8%
FRINGE BENEFITS	5,702,903	5,192,781	(510,122)	-8.9%
WORKERS' COMPENSATION	653,540	335,469	(318,071)	-48.7%
CHEMICALS	3,672,878	3,098,007	(574,871)	-15.7%
ENERGY AND UTILITIES	6,299,962	6,076,700	(223,262)	-3.5%
MAINTENANCE	7,708,630	6,510,688	(1,197,942)	-15.5%
TRAINING AND MEETINGS	108,364	86,254	(22,110)	-20.4%
PROFESSIONAL SERVICES	2,227,171	1,836,410	(390,761)	-17.5%
OTHER MATERIALS	1,097,954	932,769	(165,185)	-15.0%
OTHER SERVICES	6,588,715	6,463,752	(124,963)	-1.9%
TOTAL DIRECT EXPENSES	\$ 60,778,274	\$ 54,856,503	\$ (5,921,770)	-9.7%
INSURANCE	\$ 985,900	\$ 885,450	\$ (100,450)	-10.2%
WATERSHED/PILOT	3,684,804	3,473,084	(211,720)	-5.7%
HEEC PAYMENT	1,747,988	1,715,514	(32,474)	-1.9%
MITIGATION	423,340	423,340	-	0.0%
ADDITIONS TO RESERVES	353,162	353,162	-	0.0%
RETIREMENT FUND	11,205,000	11,205,000	-	0.0%
POST EMPLOYEE BENEFITS	-	-	-	---
TOTAL INDIRECT EXPENSES	\$ 18,400,194	\$ 18,055,550	\$ (344,644)	-1.9%
STATE REVOLVING FUND	\$ 22,441,124	\$ 22,441,124	\$ -	0.0%
SENIOR DEBT	58,639,470	58,639,470	-	0.0%
DEBT SERVICE ASSISTANCE	(1,287,870)	(1,287,870)	-	0.0%
CURRENT REVENUE/CAPITAL	-	-	-	---
SUBORDINATE MWRA DEBT	31,133,308	31,133,308	-	0.0%
LOCAL WATER PIPELINE CP	-	-	-	---
CAPITAL LEASE	804,265	804,265	-	0.0%
VARIABLE DEBT	-	(2,857,143)	(2,857,143)	---
DEFEASANCE ACCOUNT	-	-	-	---
DEBT PREPAYMENT	-	-	-	---
TOTAL CAPITAL FINANCE EXPENSE	\$ 111,730,297	\$ 108,873,154	\$ (2,857,143)	-2.6%
TOTAL EXPENSES	\$ 190,908,765	\$ 181,785,207	\$ (9,123,557)	-4.8%
REVENUE & INCOME				
RATE REVENUE	\$ 198,021,000	\$ 198,021,000	\$ -	0.0%
OTHER USER CHARGES	2,386,495	2,497,231	110,736	4.6%
OTHER REVENUE	853,895	1,687,420	833,525	97.6%
RATE STABILIZATION	312,500	312,500	-	0.0%
INVESTMENT INCOME	1,009,518	966,361	(43,157)	-4.3%
TOTAL REVENUE & INCOME	\$ 202,583,408	\$ 203,484,512	\$ 901,105	0.4%

Cost of Debt

1st Quarter – FY22

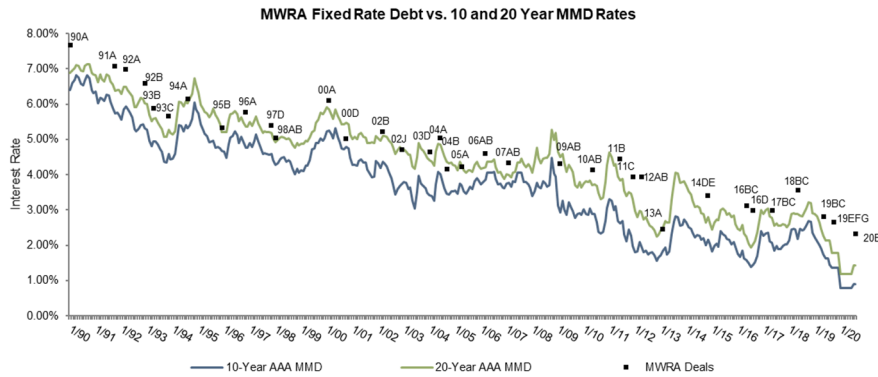
MWRA borrowing costs are a function of the fixed and variable tax exempt interest rate environment, the level of MWRA's variable interest rate exposure and the perceived creditworthiness of MWRA. Each of these factors has contributed to decreased MWRA borrowing costs since 1990.

Average Cost of MWRA Debt FYTD

Fixed Debt (\$3.26 billion)	3.36%
Variable Debt (\$299.1million)	0.45%
SRF Debt (\$832.3 million)	1.64%
Weighted Average Debt Cost (\$4.39 billion)	2.84%

Most Recent Senior Fixed Debt Issue August 2020

2020 Series B (\$160.0 million) 2.33 %

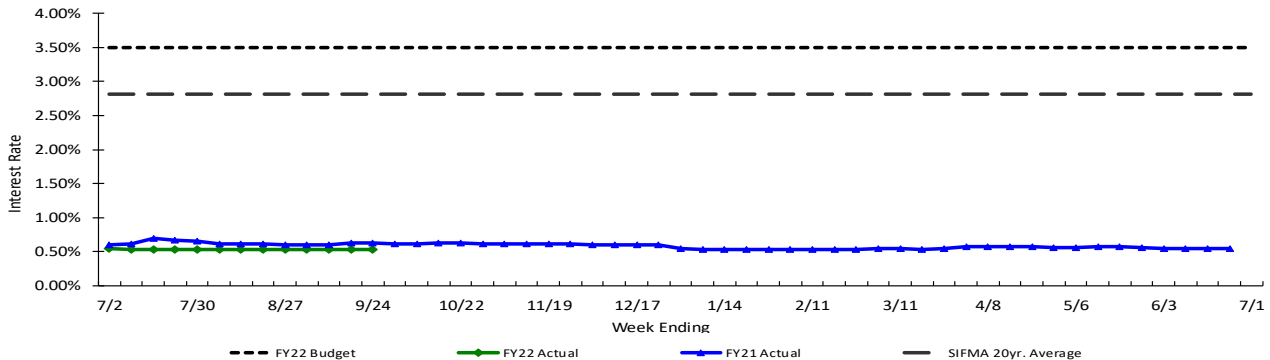


Bond Deal	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A	2004B	2005A	2006AB	2007AB
Rate	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%	4.17%	4.22%	4.61%	4.34%
Avg Life	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs	13.5 yrs	18.4 yrs	25.9 yrs	24.4 yrs

Bond Deal	2009AB	2010AB	2011B	2011C	2012AB	2013A	2014D-F	2016BC	2016D	2017BC	2018BC	2019BC	2019EFG	2020B
Rate	4.32%	4.14%	4.45%	3.95%	3.93%	2.45%	3.41%	3.12%	2.99%	2.98%	3.56%	2.82%	2.66%	2.33%
Avg Life	15.4 yrs	16.4 yrs	18.8 yrs	16.5 yrs	17.9 yrs	9.9 yrs	15.1 yrs	17.4 yrs	18.8yrs	11.2 yrs	11.7yrs	11.9yrs	9.73 yrs.	15.6 yrs

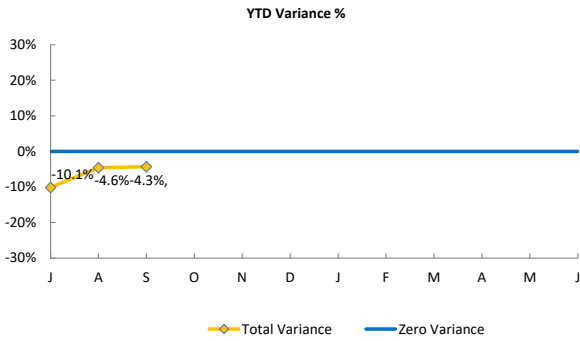
Weekly Average Variable Interest Rates vs. Budget

MWRA currently has nine variable rate debt issues with \$540.7 million outstanding, excluding commercial paper. Of the ten outstanding series, four 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, the SIFMA rate was 0.02% 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.



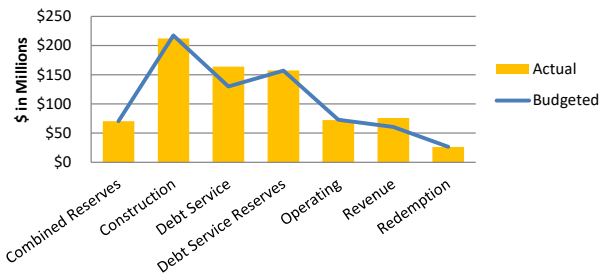
Investment Income 1st Quarter – FY22

Year To Date



	YTD BUDGET VARIANCE (\$000)				
	BALANCES IMPACT	RATES	IMPACT	TOTAL	%
Combined Reserves	(\$0)		(\$0)	(1)	-0.4%
Construction	(\$1)		(\$24)	(25)	-33.8%
Debt Service	\$12		(\$20)	(8)	-17.5%
Debt Service Reserves	\$0		(\$9)	(9)	-1.7%
Operating	(\$1)		\$1	(0)	-0.2%
Revenue	\$10		(\$10)	0	0.9%
Redemption	(\$0)		(\$0)	(1)	-1.0%
Total Variance	\$19		(\$62)	(\$43)	-4.3%

YTD Average Balances Budgeted vs. Actual

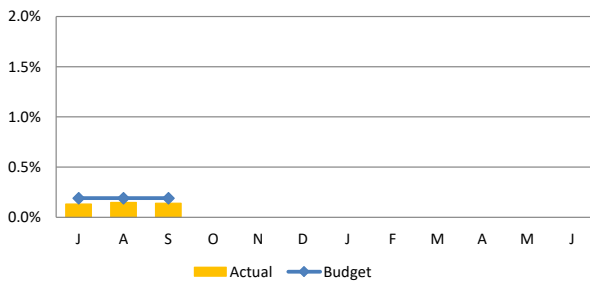


YTD Average Interest Rate Budgeted vs. Actual

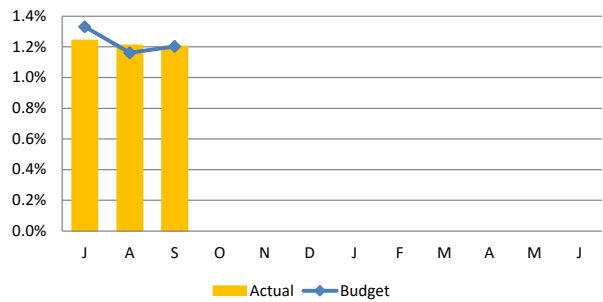


Monthly

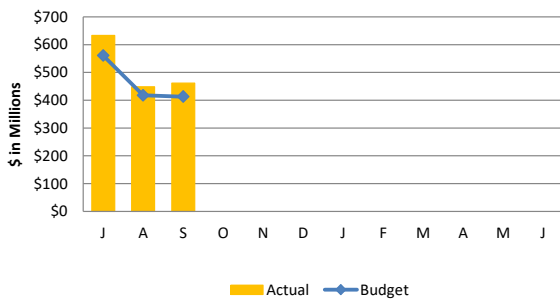
Short -Term Interest Rates



Long -Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances

