

MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

First Quarter FY2023

Q1	Q2	Q3	Q4



Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
November 16, 2022

Board of Directors Report on Key Indicators of MWRA Performance

1st Quarter - FY23

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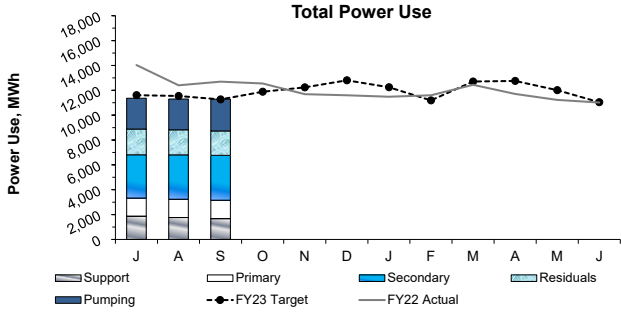
This quarterly report is prepared by MWRA staff to track a variety of MWRA performance measures for routine review by MWRA's board of directors. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for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

Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
November 16, 2022

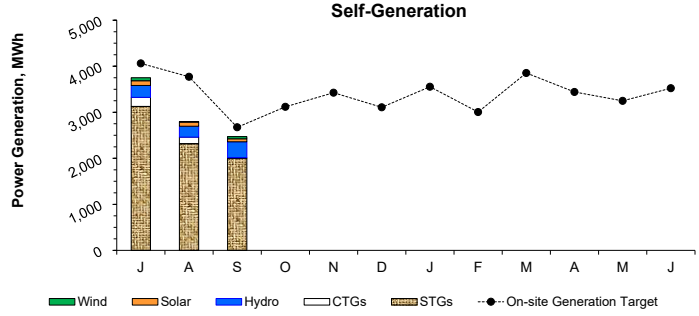
OPERATIONS AND MAINTENANCE

Deer Island Operations

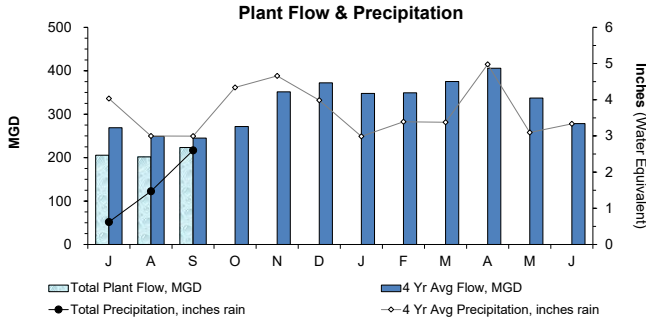
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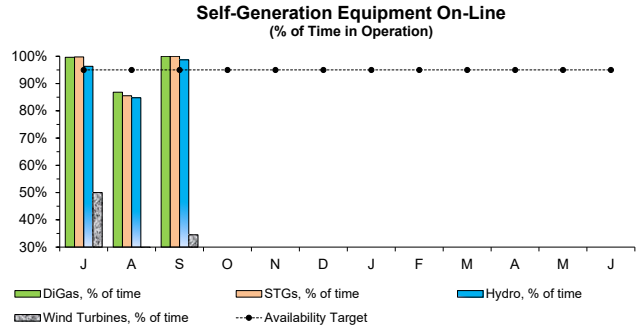
Total power usage in the 1st Quarter was 1.4% below target as plant flow for this period was 17.3% below target with historical data (4 year average) used to generate the electricity model. As a result, power usage in nearly all areas and treatment processes was similar to or below target, including power used for raw wastewater pumping, which was 8.4% below target.



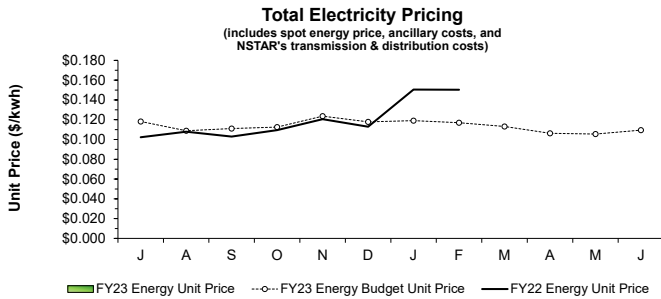
Power generated on-site during the 1st Quarter was 14.1% below the target. CTGs generation was below target by 49.5% as operation for ISO-New England demand response events and for peak shaving were lower-than-expected. STGs generation was 11.3% below as digester gas production was 12.4% below target. Hydro Turbine generation was 7.4% below target as Total Plant Flow was 17.3% below target. Wind Turbine generation was 46.6% below target as Turbine #1 has been out of service since April 11 pending repairs to the failed main shaft bearing and a failed cooling fan which left Turbine #2 out of service for much of the time from August 7 to September 10. Solar Panel generation was 4.7% below target due to a faulty power supply on one of the rooftop solar arrays on the Maintenance/Warehouse Building which kept the array out of service for several days and a failed grid inverter on the solar array on the Residuals Odor Control (ROC) Facility which has kept the array out of service since September 12. The ROC solar grid inverter is no longer available and is pending repair by the vendor.



Total Plant Flow for the 1st Quarter was 17.3% below target with the budgeted 4 year average plant flow (210.2 MGD actual vs. 254.3 MGD expected) as precipitation was 53.2% below target this quarter (4.69 inches actual vs. 10.03 inches expected).

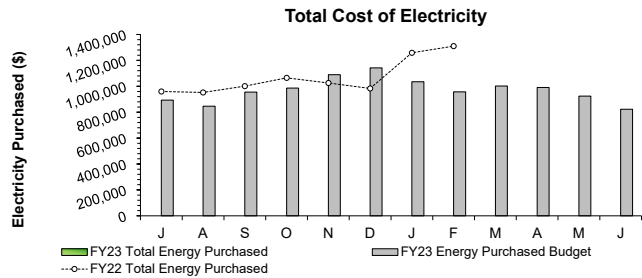


The DiGas System and STGs availability exceeded the 95% availability in the 1st Quarter, even though annual maintenance shut down portions or all of the Thermal Plant between August 21 through September 12. Hydro Turbine availability fell just below target (93.3%) due to electrical issues in the Hydro Turbine Facility in August. Wind Turbine availability was only 31.7% due to mechanical issues with Turbine #1 (main shaft bearing failure) which has left the turbine out of service since April 11, and Turbine #2 which was out of service from August 7 through September 10 due to a failed cooling fan and minor repairs that were needed on the turbine blades.



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 for July, 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 seven (7) months (since March) due to the timing of invoice receipt and review.



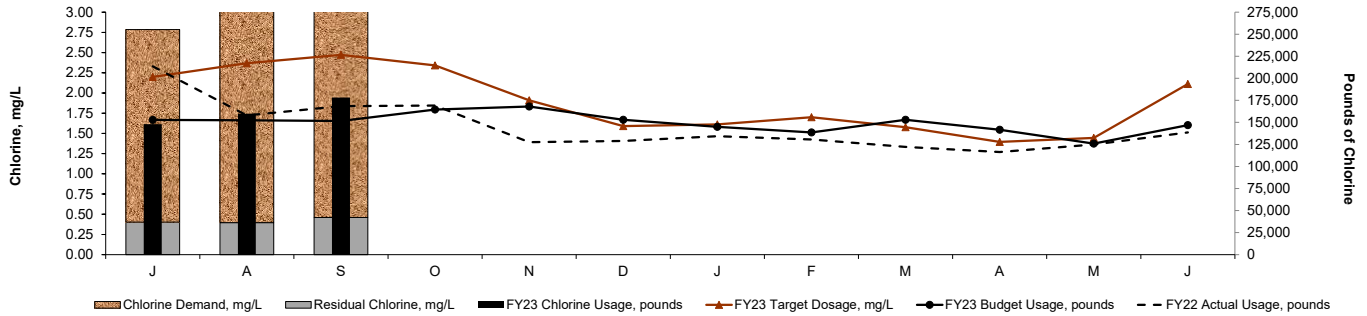
The Electricity cost data for Electricity Purchased in July, August, and September are not yet available as the complete invoices have not been received.

Note: Only months with complete Electricity Purchased data are reported. Therefore, the dataset lags by seven (7) months (since March) due to the timing of invoice receipt and review.

Deer Island Operations

1st Quarter - FY23

Deer Island Sodium Hypochlorite Use



The disinfection dosing rate in the 1st Quarter was 28.0% above target with budgetary estimates. Additionally, actual sodium hypochlorite usage in pounds of chlorine was 6.4% higher-than-expected, even though the average plant flow was 17.3% below target. DITP maintained an average disinfection chlorine residual of 0.42 mg/L this quarter with an average dosing rate of 3.01 mg/L (as chlorine demand was 2.59 mg/L). The higher hypochlorite usage and dosing is due to a higher effluent chlorine demand resulting from the lower-than-expected plant flow.

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

Secondary Blending Events

Month	Count of Blending Events	Count of Blending Events Due to Rain	Count of Blending Events Due to Non-Rain-Related Events	Secondary, as a Percent of Total Plant Flow	Total Hours Blended During Month
J	0	0	0	100.0%	0.00
A	0	0	0	100.0%	0.00
S	0	0	0	100.0%	0.00
O					
N					
D					
J					
F					
M					
A					
M					
J					
Total	0	0	0	100.0%	0.00

100.0% of all flows were treated at full secondary during the 1st Quarter as there were no blending events.

The Maximum Secondary Capacity during the entire quarter was 700 MGD. Secondary permit limits were met at all times during the 1st Quarter of FY23.

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved an instantaneous peak flow rate of 630.2 MGD during the early evening of August 26. This peak flow occurred during a storm event that brought 0.41 inches of rain to the metropolitan Boston area. The Total Plant Flow in Quarter 1 was 17.3% below the 4 year average plant flow target for the quarter.

Several recordsetting low monthly influent flows were recorded for July and August as the previous Total Plant Influent, North System Influent, and South System Influent flow records, and precipitation amounts were broken as a result of the regional drought conditions. These new records are shown in the tables below and are highlighted in yellow.

July Low Plant Flow Records

	Previous July Low Flow Record (since plant startup July 1998)	New July Low Flow Record (set 2022)	All-time Monthly Low Flow Record (since plant startup July 1998)
Total Plant Influent Flow	217.79 MGD (2016)	205.58 MGD	204.12 MGD (Sept. 2020)
North System Influent Flow	151.14 MGD (2020)	138.93 MGD	138.78 MGD (Sept. 2020)
South System Influent Flow	66.64 MGD (2016)	66.64 MGD (tied)	62.28 MGD (Sept. 2016)
Precipitation	0.63 inches (1997)	0.62 inches	0.00 inches (June 1999)

August Low Plant Flow Records

	Previous August Low Flow Record (since plant startup July 1998)	New August Low Flow Record (set 2022)	Current All-time Monthly Low Flow Record (since plant startup July 1998)
Total Plant Influent Flow	213.32 MGD (2020)	201.73 MGD (also New All Time Low Flow Record)	201.73 MGD (August 2022) Previous record: 204.12 MGD (Sept. 2020)
North System Influent Flow	145.34 MGD (2020)	139.10 MGD	138.78 MGD (Sept. 2020)
South System Influent Flow	66.96 MGD (2016)	62.63 MGD	62.28 MGD (Sept. 2016)
Precipitation	0.66 inches (2007)	No new record set (1.47 inches)	0.00 inches (June 1999)
All-time lowest Daily Average South System Flow	----	55.83 MGD (Aug 20) and 55.96 MGD (Aug 21)	55.83 MGD (August 20, 2022) Previous record: 56.26 MGD (Sept. 4, 2016)

Deer Island Operations

1st Quarter - FY23

Deer Island Operations & Maintenance Report (continued)

Secondary Treatment:

Annual turnaround maintenance on Train #1 in the Cryogenic Oxygen Facility began on September 26 and will be completed on October 7. This two (2) week turnaround maintenance is performed on roughly half of the components and systems in the Cryogenic Oxygen Facility. During this turnaround maintenance, the contractor calibrated all the instrumentation on Cold Box unit #1 as well as, a number of other components of the oxygen plant. The same turnaround maintenance was completed on Train #2 in the spring (April).

Residuals Treatment:

Module #1 Digester #4 was taken out of service on August 22 due to a clog in the digester's recirculation line or pump which prevented the ability to properly heat the sludge in the digester and also prevented the addition of ferric chloride to control struvite to this single digester. The digester was emptied of sludge to allow staff to perform essential corrective maintenance to unclog a recirculation line and to replace several faulty isolation valves. The maintenance was completed by the end of the September and staff began preparing the digester for its return to operation in October, including conducting leak tests on the repairs and other necessary maintenance.

Odor Control Treatment:

Carbon adsorber (CAD) units #1 through #4 in the East Odor Control (EOC) Facility were emptied and refilled with new regenerated activated carbon media in September as part of routine maintenance to replace spent activated carbon. CAD unit #5 in the West Odor Control (WOC) Facility was emptied of spent carbon and will be filled with regenerated carbon in October.

Energy and Thermal Power Plant:

Overall, total power generated on-site accounted for 26.6% 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.

The CTGs were operated on a total of eight (8) days in July and August for a combination of peak demand shaving, Eversource, or ISO-New England demand response events during the 1st Quarter.

Annual maintenance at the Thermal Power Plant (TPP) began on August 21 and continued through September 12. Various maintenance activities on the STG, BP-STG, the two (2) Zurn boilers, and the common systems included maintenance on various pumps, valves, and instrumentation throughout the TPP and the DITP heat loop system. On August 21, maintenance began on the offline Boiler 101 and the main STG. On August 27 and 28, Boiler 201, the BP-STG, and the Deaerator, were taken out of service to allow for maintenance to proceed on these units, as well as maintenance on the common systems, and the DITP heat loop system. The boiler common system and the BP-STG maintenance was completed on August 29 allowing Boiler 201 to be returned to service overnight. The BP-STG was placed into operation on September 1 and the STG was returned to service on September 7. A gasket leak on Boiler 101 was repaired on September 9 and the boiler was successfully test operated before returning the boiler to stand by mode. All digester gas produced was flared from August 28 to August 31 during the full TPP shutdown and there were no negative impacts caused by this annual maintenance shutdown.

On September 8, the air starter that supports CTG 2B was replaced. The air starter drives the internal high pressure compressor at the gearbox until the required rotation for ignition is reached. The unit was successfully test operated following the air starter replacement and the CTG was returned to standby status. On September 12, CTG 1A's start air tank was inspected (by Dept. of Public Safety) as required every 2 years. As a result, CTG 1A was unavailable for most of the day as the start air tank was emptied to allow for the inspection and refilling of the start air tank takes several hours to complete. CTG 1A start air tank was filled by 3:00 p.m. and the turbine was returned to stand by mode. One CTG unit was available for operation at all times during both of these tasks in the event backup power was needed.

The blades on Wind Turbines #2 were inspected on September 7 and minor repairs were performed on a couple of areas on the leading edge and a few spots on the trailing edges of the turbine blades. The areas requiring attention were cited as being caused by normal wear. Wind Turbines #1 and #2 have been in operation since April 2010.

Other:

MWRA staff hosted a tour on July 28 for approximately 30 people, including executive staff, from the Mystic River Watershed Association. The group was provided a bus tour, with MWRA senior staff on board hosting the group, and included stops with accompanying brief tours and presentations at the Alewife Pump Station, the Chelsea Creek Headworks Facility, and the Deer Island Treatment Plant. The group was also able to view the approximate location of the Somerville Marginal CSO outfall where it discharges to the receiving water while on the bus enroute from the Alewife Pump Station to the Chelsea Creek Headworks Facility. The stop at DITP included a brief tour and a lunchtime presentation by ENQUAL staff on Alewife Brook and Mystic River Water Quality. DITP hosted a similar event for the Charles River Watershed Association on August 24.

A WCVB Channel 5 film crew was at DITP on July 22 to conduct an interview with MWRA Executive Director, Mr. Fred Laskey, as well as to record footage around the treatment plant, the surrounding public access walkway, and of Boston Harbor. This footage was used in a Chronicle segment that was broadcasted on August 8 focusing on the "Changing Boston Harbor" which featured Deer Island among other Boston Harbor highlights.

DITP was host for the Boston Harbor Islands Partnership's annual meeting and awards ceremony on the afternoon of September 20. Eleven different agencies make up the Boston Harbor Islands Partnership, the federally legislated body that governs the Boston Harbor Islands National and State Park. A brief tour of the Deer Island Treatment Plant was provided for all the attendees as part of the annual meeting.

Clinton Operations & Maintenance Report

Dewatering Building

Maintenance repositioned the drive gear, replaced the top and bottom belts, upper and lower wash box seals and doctor blade on # 1 sludge belt filter press. They also replaced a gasket on a leaking polymer valve. Operations and Maintenance staff worked on repositioning the ventilation duct work and painted black lines on the wall of the sludge garage. Maintenance completed several monthly PM work orders. A contractor repaired the # 1 gravity thickener rake arm skimmer and a contractor replaced the two (2) modine heaters and installed a 2 inch pressure reducing station.

Chemical Building

Operations took #1 and #2 chlorine contact basins down for cleaning and both were returned to service. Maintenance staff cleaned several soda ash lines for the pump distribution lines. They also cleaned soda ash lines on the upstairs and down stairs mixing tank. Staff cleaned and reassembled the process water strainer and re-piped the polymer system for the phosphorus removal system. A contractor repaired a leaking 1 inch process water line.

Aeration Basins

Operations staff cleaned the pH and D.O. probes. Maintenance staff checked the oil level in all six (6) blowers. The Facilities Specialist continued with the concrete repairs on top of the aeration tanks.

Phosphorus Building

Maintenance staff acid washed all three (3) disk filters, cleaned the troughs, and inspected all the nozzles. Staff replaced tubing with hard piping and cleaned the #1 polymer pump. Operation staff cleaned both CL17 chlorine analyzers.

Headworks

Plant staff hose cleaned Lancaster's Parshall Flume. Maintenance also cleaned the influent and mechanical bar rack and greased the upper and lower pin racks. They also installed a new sump pump # 2 in lower grit.

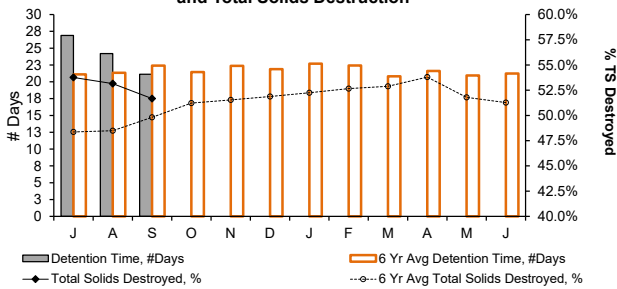
Digester Building

Operations staff changed from # 2 to #1 sludge digester heater. A contractor cleaned the boiler tubes and installed new gaskets on both units. Maintenance staff greased the floating cover mixers. The Facilities Specialist vacuumed and pressure washed the boiler room in preparation for paint. Deer Island staff connected the digester boiler room gas detector to the plant verbatim alarm system.

Deer Island Operations and Residuals

1st Quarter - FY23

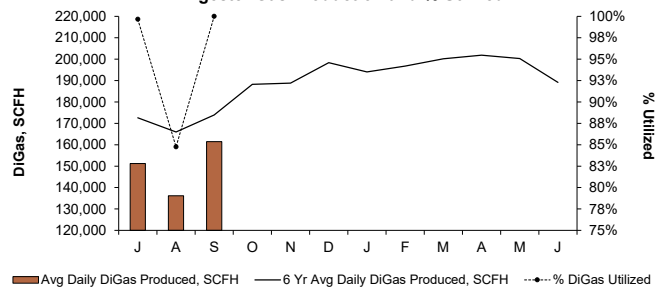
Sludge Detention Time in Digesters and Total Solids Destruction



Total solids (TS) destruction following anaerobic sludge digestion averaged 52.9% during the 1st Quarter, 8.1% above target with the 6 year average of 48.9%. Sludge detention time in the digesters was 24.1 days, 11.4% above target. 7.5 digesters were in operation, below target with the 6 year average of 7.8 digesters due to corrective maintenance needed to unclog the Mod #1 Digester 4 recirculation line. Sludge detention time and solids destruction was higher-than-expected as the volume of sludge going to the digesters was lower-than-expected.

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.

Digester Gas Production and % Utilized

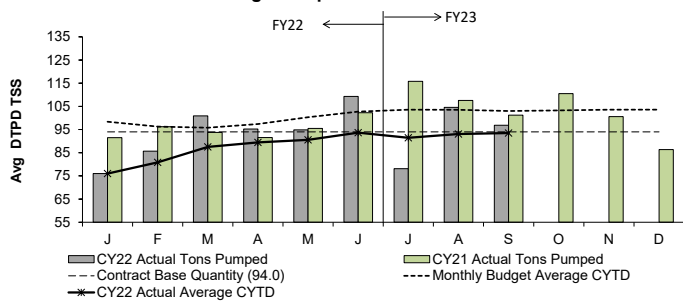


The Avg Daily DiGas Production in the 1st Quarter was 12.4% below the 6 Year Avg Daily DiGas Production due to 19.1% lower-than-expected primary sludge production as a result of the lower plant flows. 94.8% of the DiGas produced was utilized at the Thermal Power Plant as usage in August was 84.8% due to the annual Thermal Power Plant maintenance shutdown.

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 (FY22's budget is 104.0 DTPD/TSS and the preliminary FY23's budget is 103.3 DTPD/TSS).

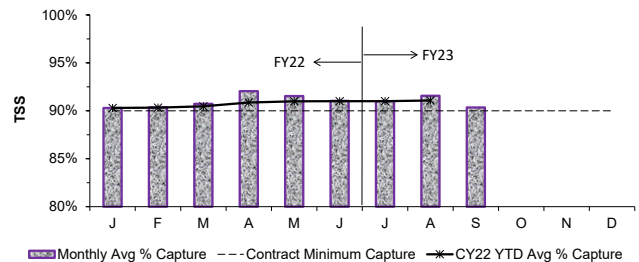
Sludge Pumped From Deer Island



The average quantity of sludge pumped to the Biosolids Processing Facility (BPF) in the 1st Quarter was 93.2 TSS Dry Tons Per Day (DTPD), 10.1% below target with the FY23 budget of 103.6 TSS DTPD for the same period.

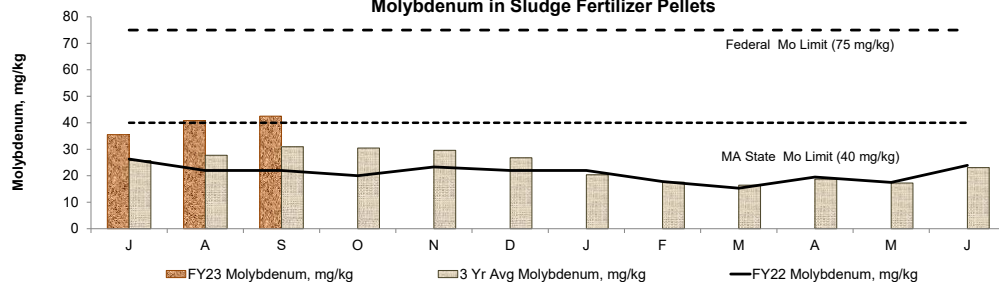
The overall CY22 average quantity of sludge pumped through September is 93.5 DTPD, 9.2% below target compared to the CY22-to-date average budget of 103.0 DTPD for the same time period.

Monthly Average % Capture of Processed Sludge



The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 1st Quarter was 90.98%.

Molybdenum in Sludge Fertilizer Pellets



Copper, lead, and molybdenum (Mo) are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. Molybdenum-based cooling tower water is a significant source of Mo in the sludge fertilizer pellets. The Federal standard for Mo is 75 mg/kg. In 2016, Massachusetts Type 1 biosolids standard for molybdenum was changed to 40 mg/kg from the previous standard of 25 mg/kg. This has allowed MWRA to sell its pellets in-state for land application whereas the previous limits forced several months' worth of pellets to be shipped out of state. This made it an impractical source of fertilizer for local Massachusetts farms since NEFCO does not distribute product that does not meet the suitability standards.

The levels have been below the DEP Type 1 limit copper and lead. For Mo, the level in the MWRA sludge fertilizer pellets during the 1st Quarter averaged 39.6 mg/kg, 41% above the 3 year average, on target (-1%) with the MA State Limit, and 47% below the Federal Limit. However, the August Mo level of 40.8 mg/kg and the September Mo level of 42.5 mg/kg were above the MA State Limit, causing the sales of the pellets to be restricted to a smaller market where the product is still able to be utilized. Above average summer temperatures have resulted in increased Mo levels due to increased air conditioning "blow down" and the use of Mo-containing corrosion chemicals.

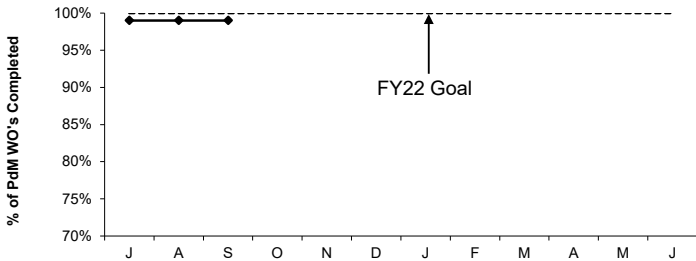
Deer Island Maintenance

1st Quarter - FY23

Productivity Initiatives

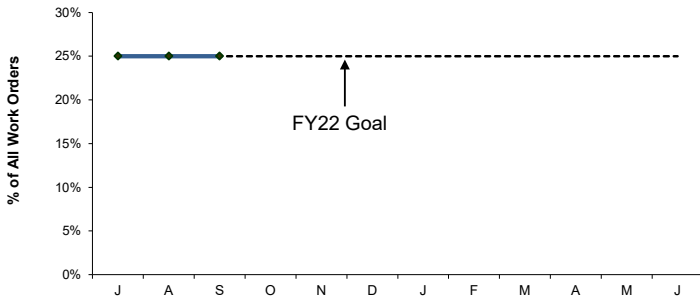
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.

Predictive Maintenance Compliance



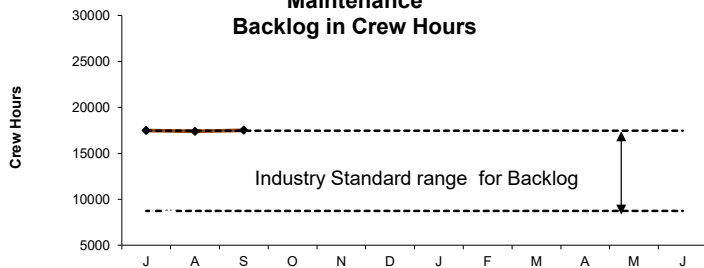
Deer Island's FY23 predictive maintenance goal is 100%. DITP completed 99% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program. Deer Island is below our goal this quarter, but we are trending upward.

Predictive Maintenance



Deer Island's increased FY23 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

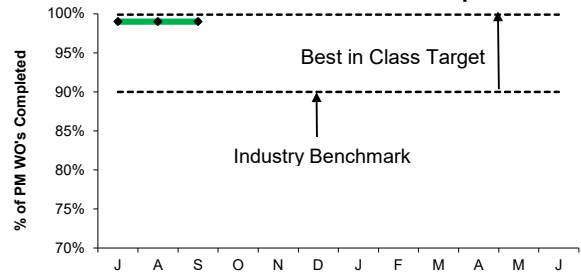


DITP's maintenance backlog at Deer Island is 17,501 hours this quarter. DITP is above the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by (5) vacancies; (2) Electricians, (1) O&M Specialist, (1) HVAC Technician and (1) Welder. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

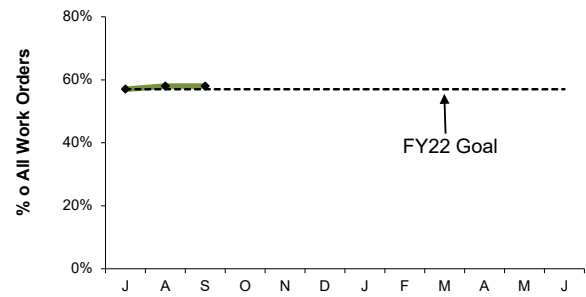
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.

Preventive Maintenance Compliance



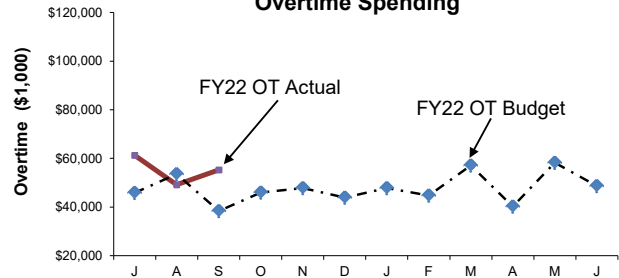
Deer Island's FY23 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 99% of all PM work orders this quarter. Deer Island was below our goal, but within Best in Class Target.

Maintenance Kitting



Deer Island's increased FY23 maintenance kitting goal is 57% of all work orders to be kitted. 58% 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 \$28K this quarter and \$28k 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, Installation of Cooling Tower Bypass System, Start-Up/Testing of EN:DG.CHILL-2000, Repair of Hypo Tank Farm Emergency Showers, Thermal Boiler Annual Outage, and Miscellaneous Tank Work.

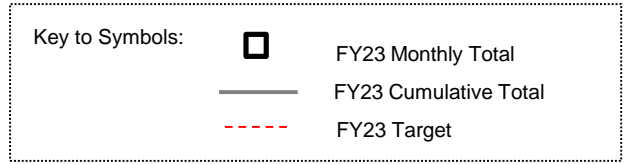
Water Distribution System Valves

1st Quarter - FY23

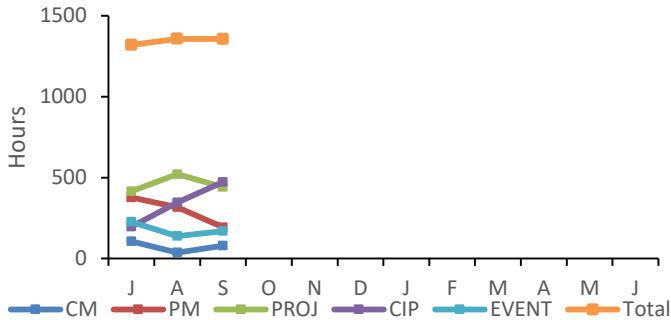
Background

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	
		FY23 to Date	FY23 Targets
Main Line Valves	2,159	97.1%	95%
Blow-Off Valves	1,682	98.6%	95%
Air Release Valves	1,519	95.8%	95%
Control Valves	49	100.0%	95%

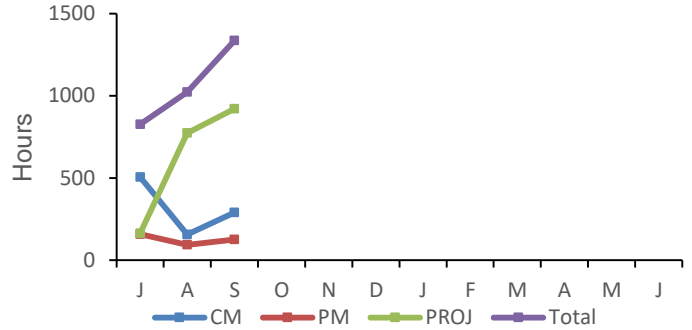


Water Valve Labor Hours



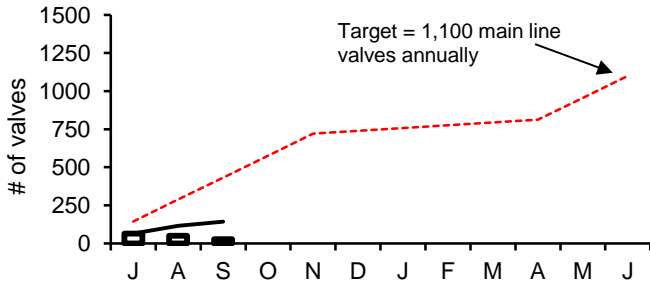
During Q1 FY23 there was a total of 4033 hours worked. Percentage breakdown; Corrective Maintenance 5%, Preventative Maintenance 22%, Project 34%, Capital Improvement Project 25%, Event - Wtr Fountain 13%

Water Pipeline Labor Hours



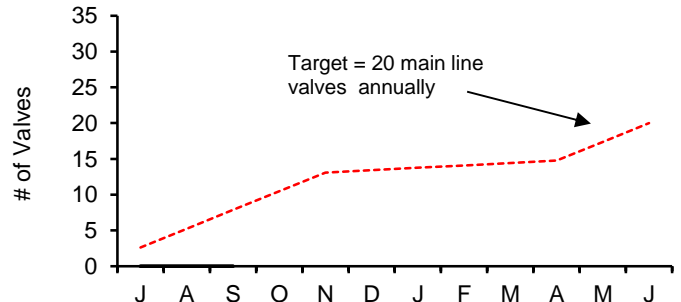
During Q1 FY23 there was a total of 3185 hours worked. Percentage breakdown; Corrective Maintenance 30%, Preventative Maintenance 12%, Project 58%

Main Line Valves Exercised



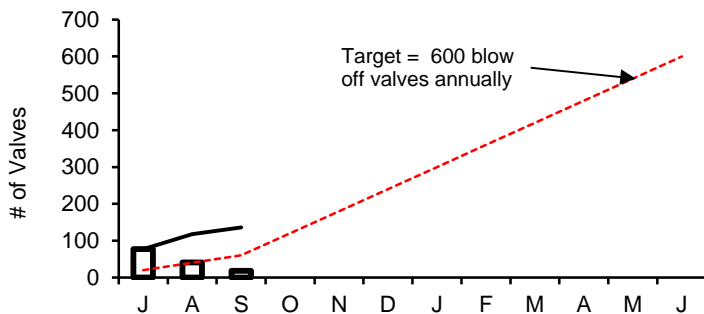
During Q1 FY23, 143 main line valves were exercised. The total exercised for the fiscal year to date is 143. Below target due to necessary hours spent to support Capital Improvement Projects and in-house construction work.

Main Line Valves Replaced



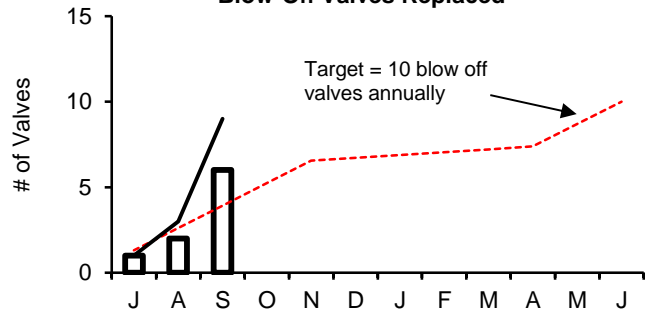
During Q1 FY23, there were no main line valves replaced. The total replaced for the fiscal year to date is 0. Below target due to staff vacancies.

Blow-Off Valves Exercised



During Q1 of FY23, 136 blow off valves were exercised. The total exercised for the fiscal year to date is 136.

Blow-Off Valves Replaced



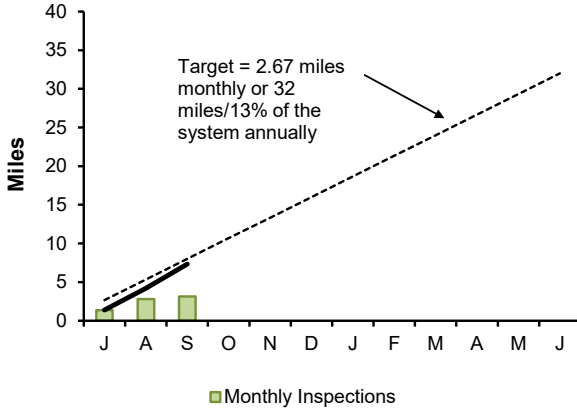
During Q1 of FY23, there were 9 blow off valves replaced. The total replaced for the fiscal year to date is 9.

Wastewater Pipeline and Structure Inspections and Maintenance

1st Quarter - FY23

Inspections

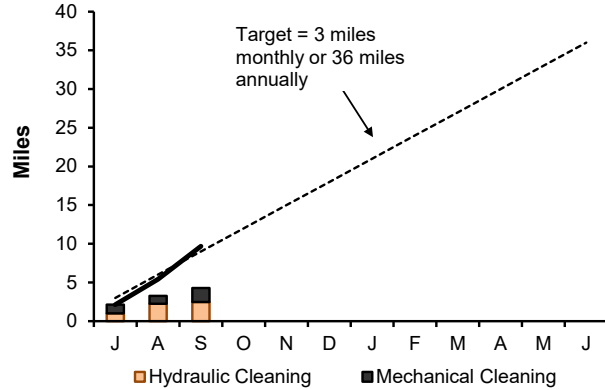
Pipeline Inspections



Staff internally inspected 7.33 miles of MWRA sewer pipe during this quarter. The year to date total is 7.33 miles. No Community Assistance was provided.

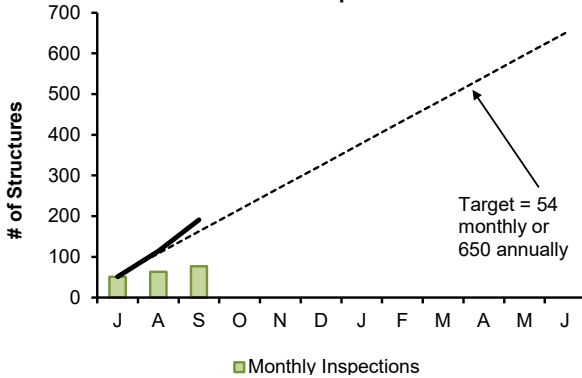
Maintenance

Pipeline Cleaning



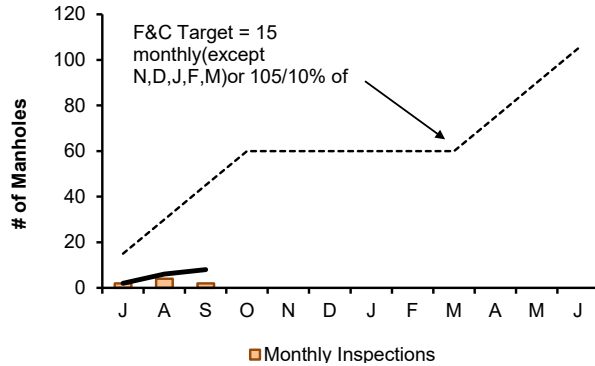
Staff cleaned 9.68 miles of MWRA sewer pipe, and removed 14 yards of grit. The year to date total is 9.68 miles. No Community Assistance was provided.

Structure Inspections



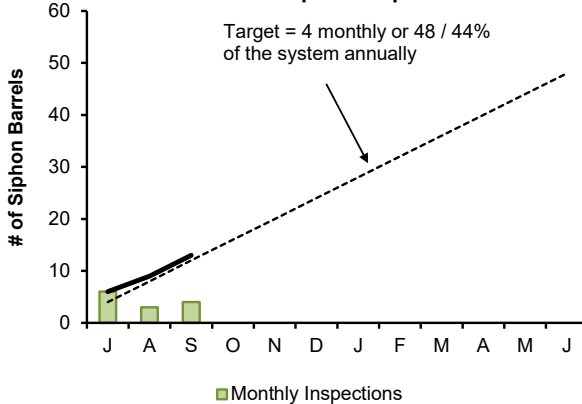
Staff inspected the 12 CSO structures and performed 65 other additional manhole/structure inspections during this quarter. The year to date total is 77 inspections.

Manhole Rehabilitation



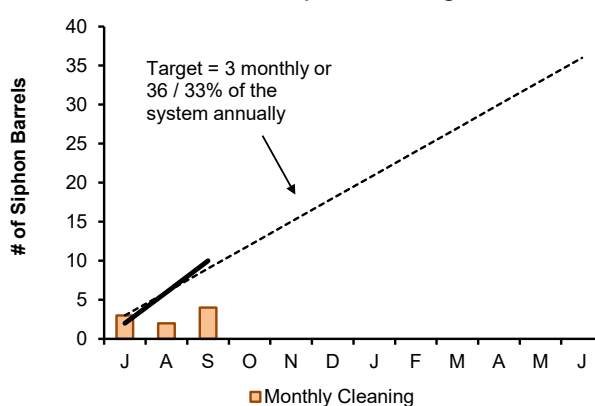
Staff replaced 8 frame and cover replacements this quarter. The year to date total is 8.

Inverted Siphon Inspections



Staff inspected 13 siphon barrels this quarter. The year total is 13 inspections.

Inverted Siphon Cleaning

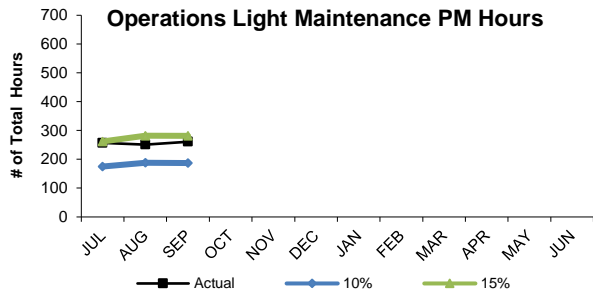


Staff cleaned 10 siphon barrels this quarter.

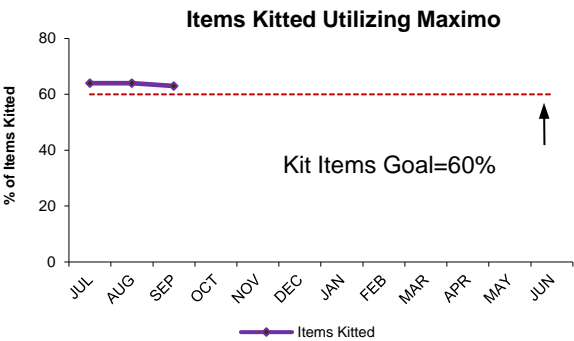
Field Operations' Metropolitan Equipment & Facility Maintenance

1st Quarter - FY FY23

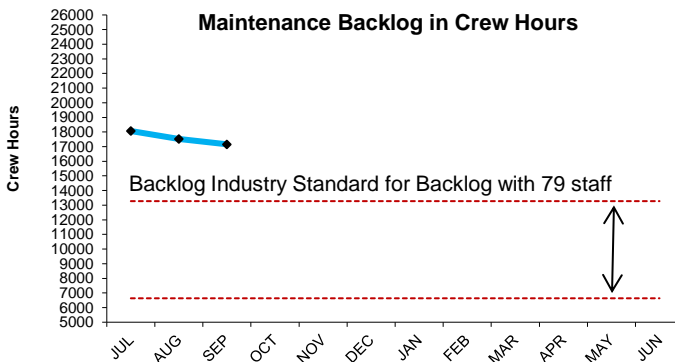
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion is 100%. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus reducing maintenance spending. Backlog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



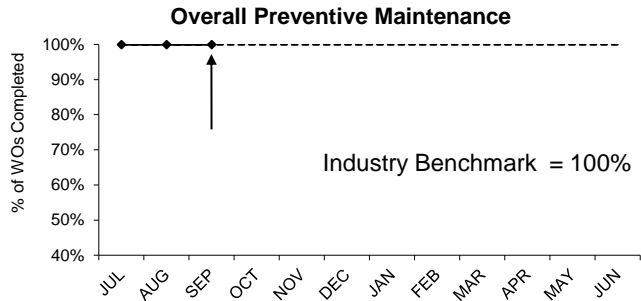
Operations staff averaged 256 hours per month of preventive maintenance during the 1st Quarter of FY23, an average of 14% of the total PM hours for the 4th Quarter, which is within the industry benchmark of 10% to 15%.



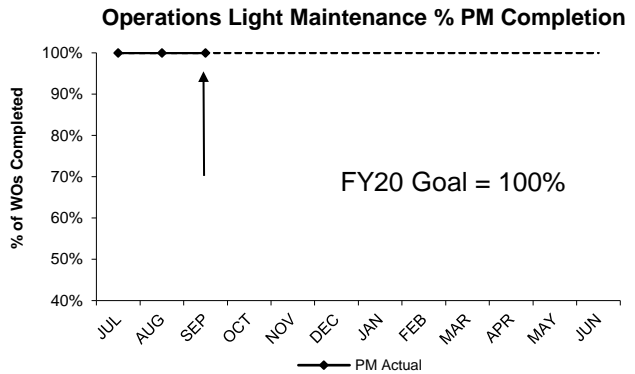
Operations' FY23 maintenance kitting goal has been set at 60% of all work orders to be kitted. Kitting is the staging of parts or material necessary to complete maintenance work. In the 1st Quarter of FY23, 64% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



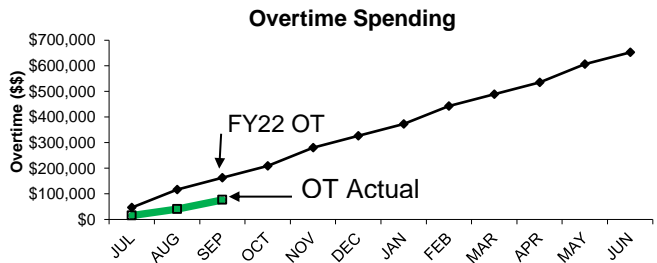
The 1st Quarter of FY23 backlog average is 17,583 hours. Management's goal is to continue to control overtime and try to get back within the industry benchmark of 6,636 to 13,275 hours. The increase is due to vacations, vacancies and several large maintenance projects.



The Field Operations Department (FOD) preventive maintenance goal for FY23 is 100% of all PM work orders. Staff completed 100% of all PM work orders in the 1st Quarter of FY23.



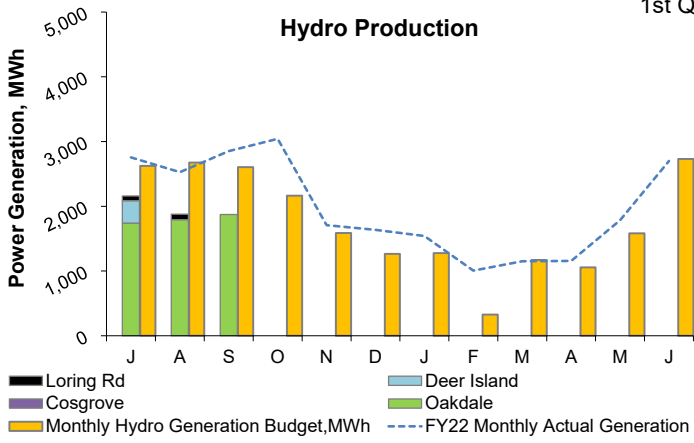
Wastewater Operations complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY23 PM goal is completion of 100% of all PM work orders assigned. Operations completed 100% of PM work orders in the 1st Quarter of FY23.



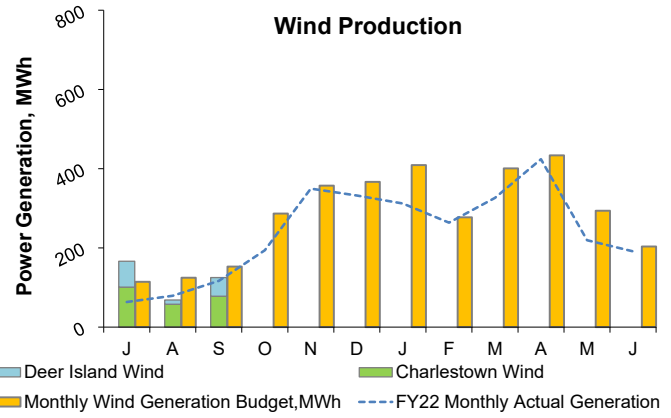
Maintenance overtime was \$28,976 under budget on average, per month, for the 1st Quarter of FY23. Overtime is used for critical maintenance repairs and wet weather events. The overtime budget through the 1st Quarter of FY23 is \$163,138. Overtime spending was \$76,209 which is \$86,929 under budget for the fiscal year.

Renewable Electricity Generation: Savings and Revenue

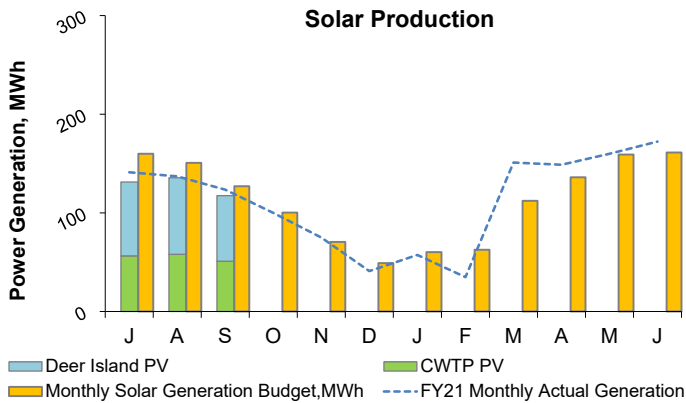
1st Quarter - FY23



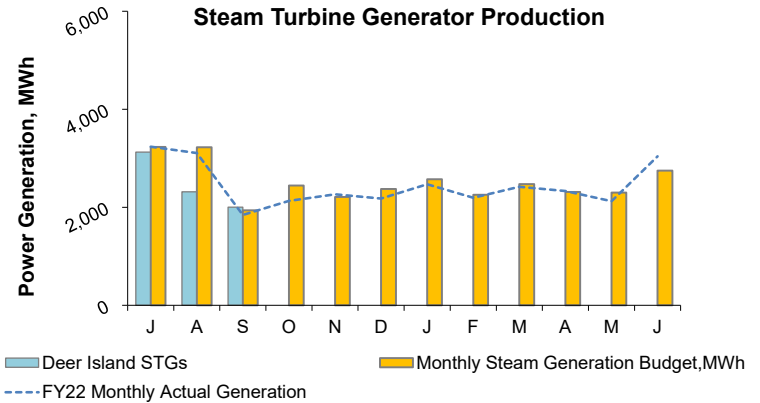
In Quarter 1 of FY23, the renewable energy produced from all hydro turbines totaled 6,512 MWh; 18% below budget³. Savings and revenue invoices have not yet been received for this FY23 reporting period.



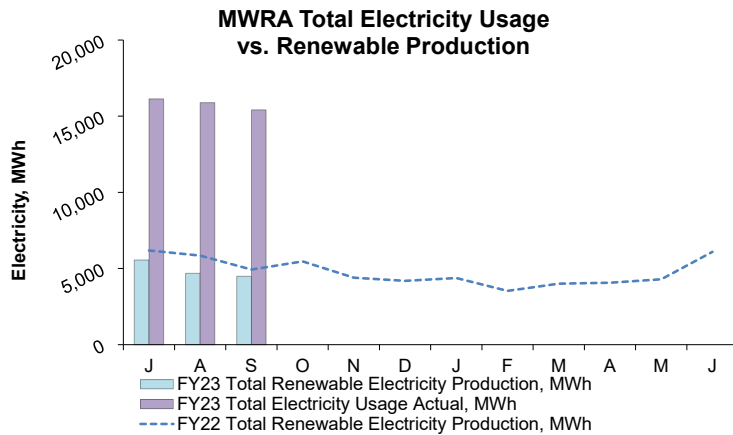
In Quarter 1 of FY23, the renewable energy produced from all wind turbines totaled 360 MWh; 8% below budget³. Savings and revenue invoices have not yet been received for this FY23 reporting period.



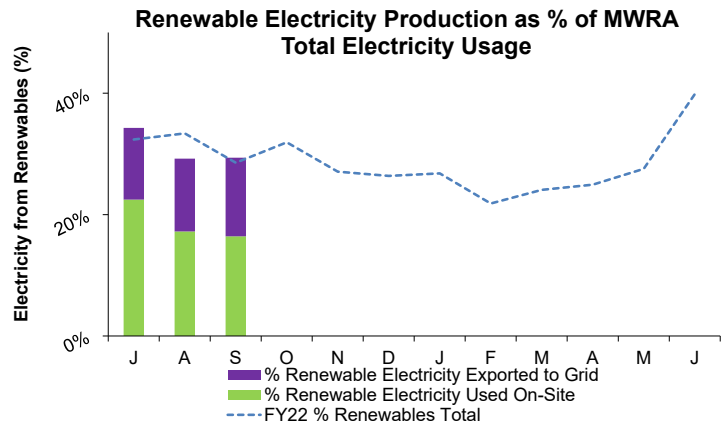
In Quarter 1 of FY23, the renewable energy produced from all solar PV systems totaled 422 MWh; 4% below budget³. Savings and revenue invoices have not yet been received for this FY23 reporting period.



In Quarter 1 of FY23, the renewable energy produced from all steam turbine generators totaled 7,444 MWh; 11% below budget³. Savings and revenue invoices have not yet been received for this FY23 reporting period.



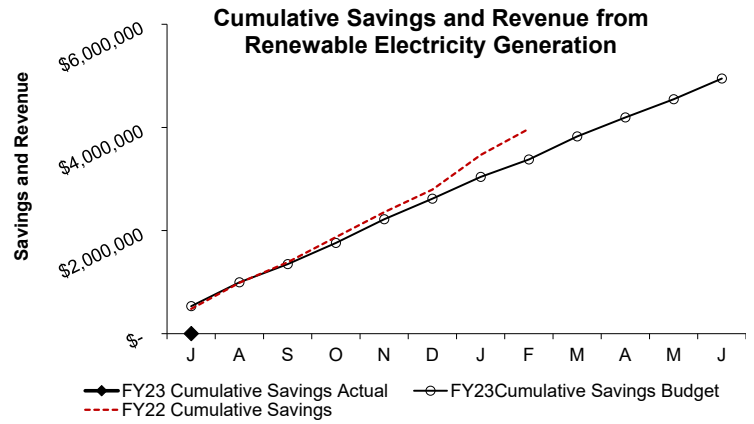
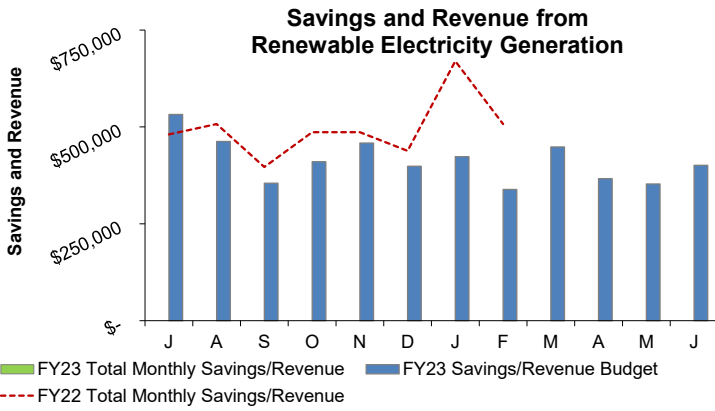
In Quarter 1 of FY23, MWRA's electricity generation by renewable resources totaled 14,737 MWh, 14% below budget. MWRA's total electricity usage was approximately 47,449 MWh. Renewable resources were 31% of total usage. The MWRA total electricity usage is the sum of all electricity purchased for Deer 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.

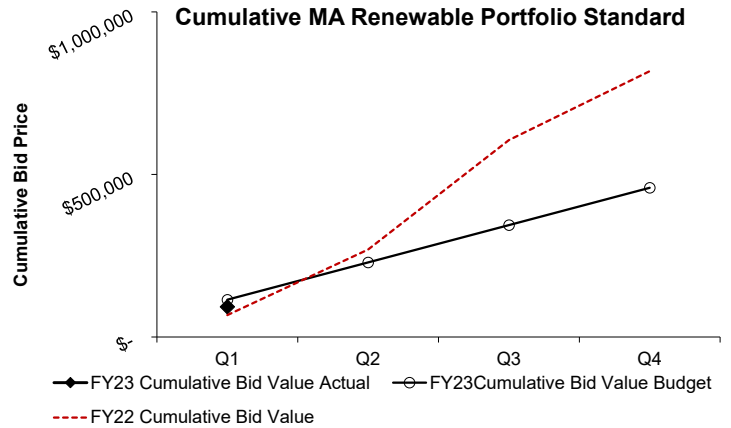
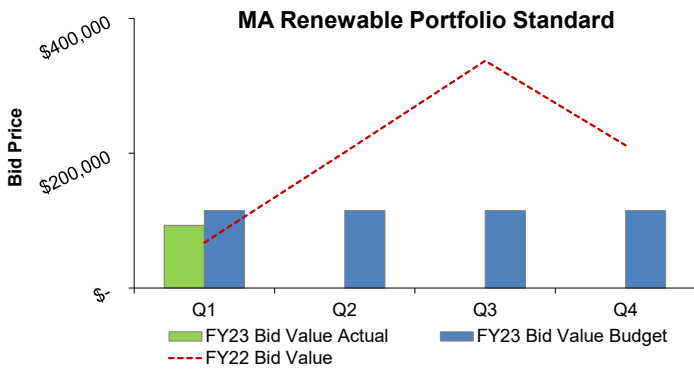
Renewable Electricity Generation: Savings and Revenue

1st Quarter - FY23



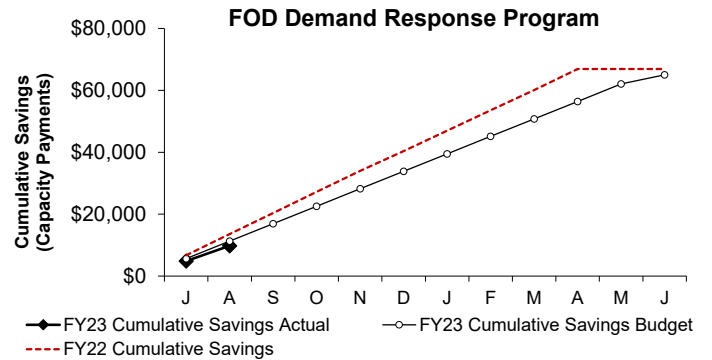
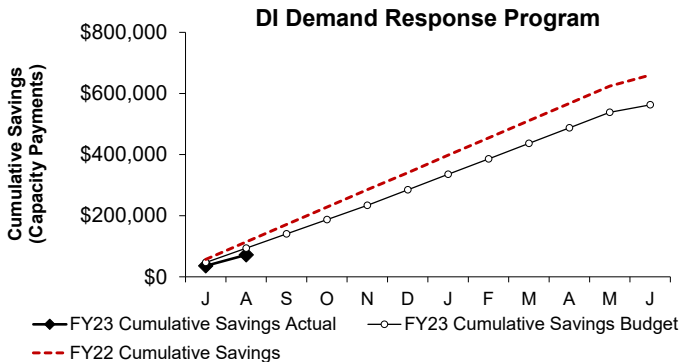
Savings and revenue invoices have not yet been received for this FY23 reporting period.

Savings and revenue² from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs). The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).



Bids were awarded during the 1st Quarter¹ from MWRA's renewable energy assets; 2,625 Q1 CY2022 Class I Renewable Energy Certificates (RECs) were sold for a total value of \$92,920 RPS revenue; which is 19% 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 are being reported for Q1 CY2022 sales. Class II RECs have not been sold and are currently reserved for future sale. SRECs have converted to Class 1 RECs starting in FY23.

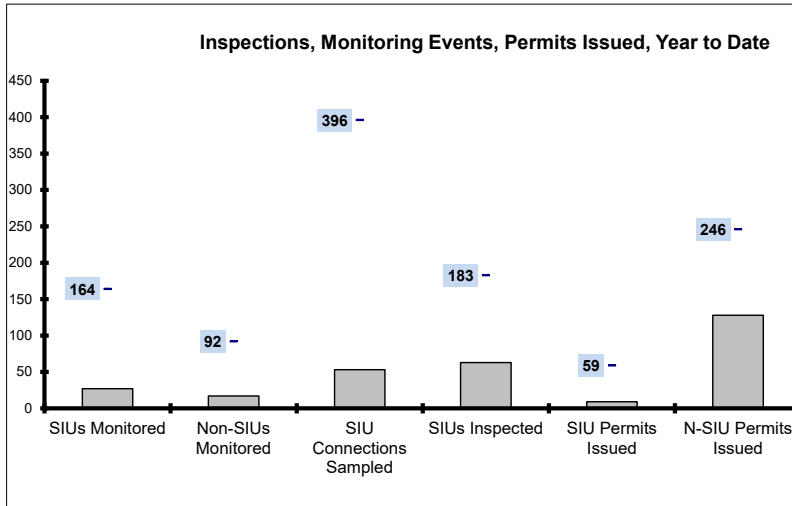


Currently Deer Island, JCWTP, Loring Rd, and Brusch participate in the ISO-New England Demand Response Programs⁴. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments 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 \$71,738 for DI and payments for FOD total \$9,800 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 - FY23



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
Jul	0	9	0	3	1	8	1	20
Aug	1	38	1	8	1	18	3	64
Sep	5	14	0	5	0	25	5	44
Oct							-	-
Nov							-	-
Dec							-	-
Jan							-	-
Feb							-	-
Mar							-	-
Apr							-	-
May							-	-
Jun							-	-
% YTD	67%	48%	11%	13%	22%	40%	9	128

This is the first quarter of the MWRA fiscal year, FY23.

In the first quarter, 137 permits were issued, of which 9 were SIUs. Six of the SIU permits were issued within the 120-day timeframe, with two issued beyond 181 days. There were 128 non-SIU permits issued, of which 67 were issued late.

Reasons for late issuances continue to include a) staffing due to turnover and vacancies b) waiting for critical data needed for permit processing c) delays relating to new start-up operations and d) the late payment of the relevant permit charges. In addition, there are new Industrial Coordinators on board which caused some slow-down in processing while they get acquainted with their roles.

There were 66 new permits issued: 1-SIU and 5 N-SIUs not including 23-Low Flow Permits, 34-Dental, 1-Food Processing and 2-Construction dewatering.

For the Clinton Sewer Service area, there were no SIU permits issued during the first quarter of the FY23 fiscal year.

EPA Required SIU Monitoring Events for FY23: 164
YTD : 27

Required Non-SIU Monitoring Events for FY23: 92
YTD : 17

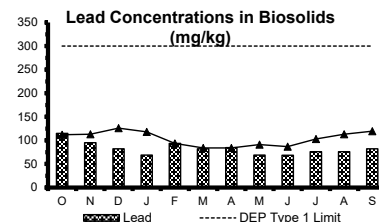
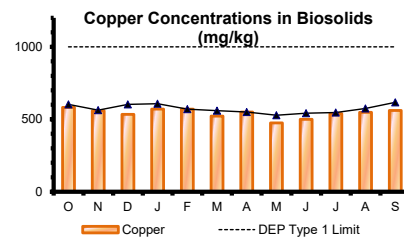
SIU Connections to be Sampled For FY23: 396
YTD: 53

EPA Required SIU Inspections for FY23: 183
YTD: 63

SIU Permits due to Expire In FY23: 59
YTD: 9

Non-SIU Permits due to Expire for FY23: 246
YTD: 128

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

3rd Quarter – FY22

Western Water Operations and Maintenance

- Chestnut Hill Reservoir Refill via the Sudbury Aqueduct: Chestnut Hill had been lowered below its normal operating band to freeze invasive plants. To refill it, staff activated the Sudbury Aqueduct in March. It took around 7 hours for flow to reach Chestnut Hill and 3.5 days to refill it. Activation provided a training opportunity on the operation of this critical backup facility.
- Hultman Tree Project: About 5 acres of Red Pine trees along the aqueduct in Framingham were cleared as a safety measure for the houses and school in the area. The area will be replanted.
- Oakdale Turbine Bearing Inspection: While the Oakdale turbine was offline and no Quabbin transfer was taking place this spring, staff inspected the lower bearing on the turbine. No issues were identified and the turbine has subsequently been run for environmental testing.
- Carroll Water Treatment Plant Hypochlorite Project: Replacement of all the hypo piping and pumps is still underway. During the quarter, the operations team isolated, flushed, and opened the hypo storage tanks so the project team could replace the suction line piping feeding the pumps.
- Carroll Water Treatment Plant Lighting Project: Replacement of all the fixtures at CWTP with more efficient LED fixtures was completed in March.

Operations Engineering

- Section 89 Replacement: Staff provided contingency training for communities and in-house staff.
- Staff continued community assistance as needed:
 - Newton System, supported the testing of the isolation of Ward Street to support the replacement of Newton's 20 inch.
- Staff continued to manage the lead pipe rig corrosion control study at CWTP.
- Staff assisted in several wet weather storm events, compiled and finalized storm reports, monitored and reported on CSO activation durations and volumes.
- Staff provided on-going hydraulic modeling assistance for operational shutdowns.
- Staff developed simplified SOPs for water pumping stations. Staff continued Processbook development for water and wastewater facilities and OMMS updates.
- SCADA Staff completed the investigation of pump vibration issues at Alewife and resolved gate control issues of Channel 1 at Columbus Park Headworks.
- Staff improved SCADA alarming at Nut Island Headworks and supported Chelsea Headworks
- Rehabilitation Project, Nut Island Odor Control Improvements Project, and Hayes Pump Station Improvements Project.

Wastewater Operations & Maintenance

- Ward Street and Columbus Park Headworks Upgrade – Contract 7429: Operations staff continued to work Engineering staff and the consultant for this project. Staff attended meetings to discuss the lessons learned from the Chelsea Creek Headworks upgrade project.
- Chelsea Screen House: Based on the forecast for the predicted storm surge for the incoming storm on 1/26/22, the flood barrier protection was installed at the Chelsea Screen house facility as a precaution.
- Operations & Maintenance Meeting: Operations and maintenance staff attended weekly meetings to discuss the top 25 critical maintenance items that need to be addressed. Nuisance alarms: Operations and Operations Engineering staff attended bi-weekly meetings to discuss the top 15 alarms that came into SCADA to determine if operational issues are causing the condition.
- MassDEP Sewer System Overview: Staff met with MassDEP Northeast Region on 2/22/22 to discuss the operation of the MWRA wastewater collection and transport system.

Metro Equipment and Facility Maintenance

- Commonwealth Ave East Pump Station: The variable frequency drive for Pump #3 failed. MWRA electricians installed a new drive.
- Braintree/Weymouth IPS: The #1 Vortex grit pump was not operating properly. A pinch valve for the grit pump failed. MWRA mechanics installed a new pinch valve.
- An outside vendor and an MWRA Medium Voltage electrician conducted non-invasive thermal imaging scans at Columbus Park and Ward Street Headworks, Hayes, Squantum, New Neponset, Chestnut Hill, Braintree/Weymouth, Quincy, Framingham, and Gillis pump stations, and Somerville Marginal.
- New Neponset Pump Station: Light fixtures in the screen room/wet well area of the facility were corroded beyond repair. MWRA electricians replaced fixtures with more efficient LED explosion proof lighting.
- Hingham Pump Station: Operations requested better lighting in the wet well area in preparation for the valve replacement project. MWRA electricians installed new LED explosion proof fixtures.

Metering

Wastewater upgrade project:

Field Operations Highlights

3rd Quarter – FY22

- The Wastewater Meter upgrade project had conditionally accepted all meters by the December 2021 install deadline. Staff have begun tracking wastewater community flows for billing purposes. The wastewater collection system has a stated goal of billing greater than 95% of wastewater flows off metered flows. Prior to the meter replacement project, equipment reliability had left us unable to meet this goal with data capture rates typically between 88% and 93%. During Q3FY22, the new wastewater metering system will allow MWRA to bill communities with a data capture rate of 98%. Our 95% data capture goal was met all 3 months this quarter. This is the first time we met this goal across all 3 months in a quarter since 2017.

TRAC

Compliance and Enforcement

- TRAC issued 47 Notices of Violation, 6 Notices of Noncompliance and 1 Extension Letter.
- Dental Permit Fees: TRAC issued Annual Fee Invoices to the facilities permitted under the Group Permit for Dentists. The total number of invoices issued was 738, for a total of \$150,756.

Inspections and Permitting

- TRAC monitored the septage receiving sites a total of 30 times, and conducted inspections at 20 new construction and 168 existing gasoline/oil separators.
- TRAC staff conducted 44 Annual SIU Inspections and 278 other inspections. Annual SIU Inspections are required under TRAC's EPA approved Industrial Pretreatment Program. Other inspections include inspections for enforcement, permit renewal, NSIU, follow-up, temporary construction dewatering sites, group/combined permit audits, out-of-business facility reviews, and surveys.
- 118 MWRA Sewer Use Discharge Permits (Permits) were issued and/or renewed to its sewer users. One permit was issued and/or renewed in the Clinton Service Area.

Monitoring

- TRAC completed 80 first time SIU monitoring events, 33 first time NSIU monitoring events and 124 other events including Clinton NPDES and Local Limits sampling, Metropolitan Local Limits sampling, Local Limits PFAS sampling, Special Sulfide sampling, Cosgrove and Oakdale NPDES sampling, CSO NPDES sampling, Sudbury Aqueduct monitoring and CSO Hypochlorite Tank chemical sampling.

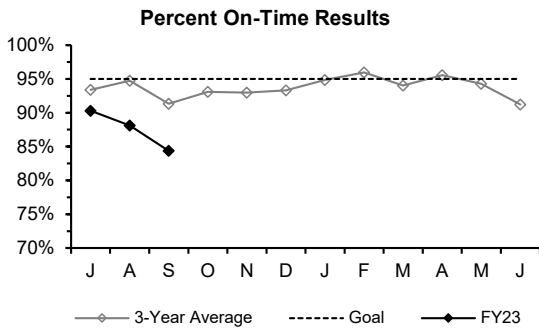
Environmental Quality-Water

- DCR algae monitoring commenced at Wachusett and Quabbin Reservoirs in March. Both reservoirs continue to be well-mixed with diatoms noted as the dominant phytoplankton. Sampling staff are preparing for algae monitoring season by establishing the annual algal toxin monitoring contract and training on the use of FlowCam Cyano fluid imaging equipment.

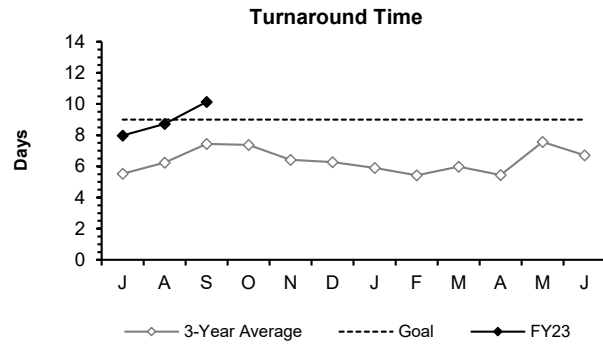
Community & In-House Support

- Sampling & Analysis: On 1/27, staff assisted Melrose with a complaint sample collection. Coliform and HPC results were non-detect and all other results were typical. On 3/23, staff assisted Hanscom AFB in collecting chlorine measurements at several coliform monitoring locations. Staff also trained their staff and the sampling contractor on proper technique for cleaning the sample taps and total chlorine testing. On 3/25, staff performed clearance samples associated with WASM-3, Segment 1A: all results were typical and bacteria results were absent for total coliform.
- Training & Guidance: Staff helped in the filming of a video for community drinking water sampling staff on proper coliform sampling technique and chlorine residual testing. On March 31, staff provided a virtual presentation to 17 MWRA and community drinking water sampling staff from several local communities on proper coliform sampling technique and chlorine residual measurement.
- Projects: Staff collected samples on six occasions during the quarter as part of the pipe-loop study. Many MWRA departments are involved in this initiative, to measure lead levels through community lead service lines with various corrosion control treatments. On March 29 and March 31, staff helped with clearance samples following an ROV inspection at four MWRA tanks: Arlington Covered, Bear Hill, Spot Pond Tank #1, and Blue Hills #1. All results were typical and bacteria results were absent for total coliform, and all tanks were cleared to go back on-line.
- Chemical Supply: Staff are closely monitoring bulk chemical inventories and adherence to delivery schedules. Staff continue to check-in with chemical suppliers to review adherence to delivery schedules and to work on chemical supply emergency planning.

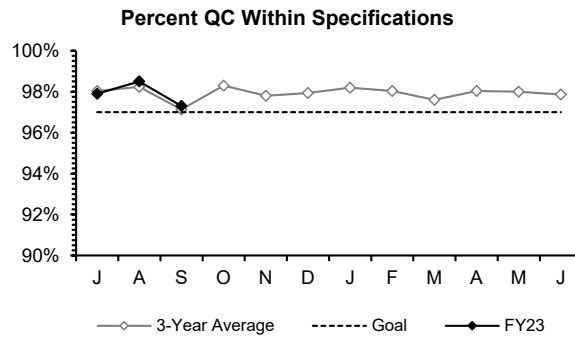
Laboratory Services 1st Quarter - FY23



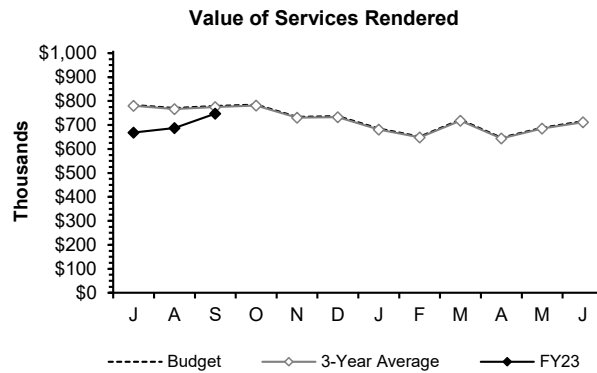
The Percent On-Time measurement continued to run below the 95% goal due to staffing vacancies.



Turnaround Time exceeded the 9-day goal.



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



Value of Services Rendered continued to run below the annual budget projection due to staffing vacancies.

Performance: Percent QC within Specification continues to meet the goal, but all other indicators fell short of the goals for the quarter due to reduced staffing levels.

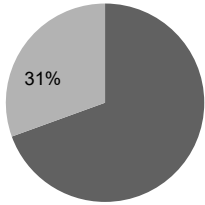
School Lead Program: During the 1st quarter of FY23, MWRA's lab completed 216 tests from 55 schools and childcare facilities in 27 communities. Since 2016, MWRA's Laboratory has conducted over 40,000 tests from 557 schools and daycares in 44 communities. We have also completed over 700 home lead tests under the DPH sampling program since 2017.

CONSTRUCTION PROGRAMS

Projects In Construction

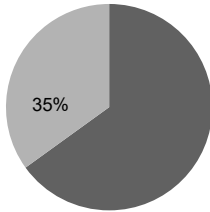
1st Quarter – FY23

Money



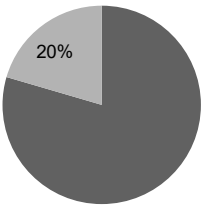
■ Amount Remaining
■ Billed to Date

Time



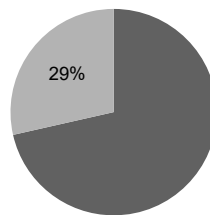
■ Days Remaining
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Money



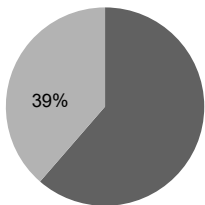
■ Amount Remaining
■ Billed to Date

Time



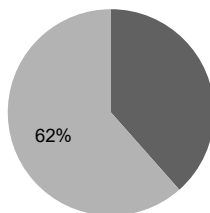
■ Days Remaining
■ Days Expended

Money



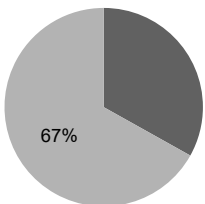
■ Amount Remaining
■ Billed to Date

Time



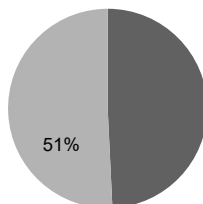
■ Days Remaining
■ Days Expended

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Carroll Water Treatment Plant SCADA Improvements

Project Summary: This project will replace SCADA Control equipment at the Carroll Plant, to enhance cybersecurity, redundancy, ensure future reliability, and maintain secure plant operations.

Contract Amount: \$12,929,159.87

Contract Duration: 1,127 Days

Notice to Proceed: 1-Sep-21

Contract Completion: 2-Oct-24

Status and Issues: As of September, the Contractor continued working in the Ozone Building coring holes and installing sleeves for conduit wall penetrations. In the Corridors, Switchgear Room and Ozone Generator Room conduit racks and conduits are being installed. In the Operation Building temporary telephone and power wiring was installed.

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 and 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: 5-Aug-21

Contract Completion: 19-Aug-25

Status and Issues: As of September, the Contractor continuing to provide submittals for review and coordination on major components of the work with longest lead time for product delivery and installation scheduling. They completed installing an additional 36" horizontal gate valve and manhole on Section 110, Straw Point, Stoneham. In addition, they completed installing 465 LF of 12" ductile iron water line for the Stone Zoo.

Low Service PRV Improvements

Project Summary: This project will replace pressure reducing valves on the Weston Aqueduct Supply Main (WASM) 4 at Nonantum Road in Boston and WASM 3 at Mystic Valley Parkway in Medford

Contract Amount: \$11,326,000

Contract Duration: 720 Days

Notice to Proceed: 14-Jul-21

Contract Completion: 4-Jul-23

Status and Issues: As of September, the Contractor took delivery of the 48" butterfly valves. They loaded trucks for the removal of excavated materials and performed additional sampling of soil samples. In addition, they were on-site to take monthly construction progress photos at W14.

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: \$19,656,427.23

Contract Duration: 1,383 Days

Notice to Proceed: 28-Oct-20

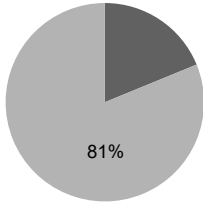
Contract Completion: 11-Aug-24

Status and Issues: As of September, the Contractor successfully shutdown and dewatered the 56" steel WASM3 pipe from the butterfly valve on Mass Ave near Swan Place to the butterfly valve on Pleasant St at Brunswick Rd.

Projects In Construction

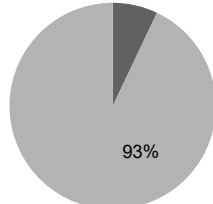
1st Quarter – FY23

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: \$58,913,925.69

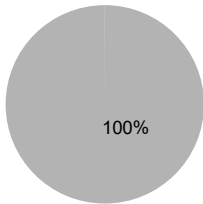
Contract Duration: 1,034 Days

Notice to Proceed: 12-Feb-20

Contract Completion: 12-Dec-22

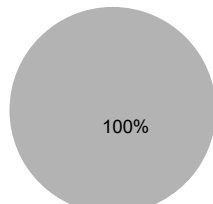
Status and Issues: As of September, the Contractor prepared the floor, installed formwork and rebar, and placed concrete for equipment pad extension for AHU-10. They removed carbon from the existing carbon adsorbers and removed from site. They demolished the FRP inlet ducts to the carbon adsorbers and removed them from the building.

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: \$8,794,899

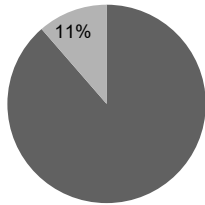
Contract Duration: 850 Days

Notice to Proceed: 13-Aug-19

Contract Completion: 10-Dec-21

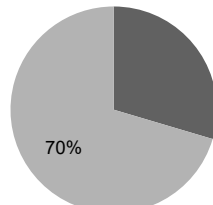
Status and Issues: This project is complete. Staff are awaiting bids for a future project to replace this one.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

DITP Odor Control Damper Replacement

Project Summary: This project involves replacing three existing 30-inch diameter steel dampers with stainless steel dampers, surface preparation and coatings application on the existing 30-inch diameter ductile iron pipe. ,

Contract Amount: \$538,000

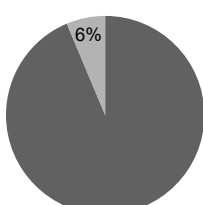
Contract Duration: 365 Days

Notice to Proceed: 3-Feb-22

Contract Completion: 3-Feb-23

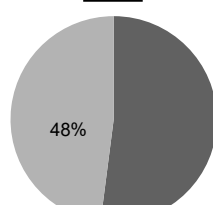
Status and Issues: As of September, the fabrication of stainless steel dampers and spool piece continues.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Clinton Screw Pump Replacement

Project Summary: This project involves demolishing and replacing three screw pumps and motors and three existing 72-inch by 60-inch pump isolation slide gates and associated electrical and controls.

Contract Amount: \$3,452,985

Contract Duration: 540 Days

Notice to Proceed: 14-Jan-22

Contract Completion: 8-Jul-23

Status and Issues: As of September, the gate testing plan was submitted and approved, and the gate leakage test was performed and passed.

CSO CONTROL PROGRAM

1st Quarter – FY23

Overview

In compliance with milestones in the Federal District Court Order, all 35 projects in the CSO Long-Term Control Plan (LTCP) were complete as of December 2015. Subsequently, MWRA completed a multi-year CSO post-construction monitoring program and performance assessment, filing the Final CSO Post Construction Monitoring Program and Performance Assessment Report with the Court and submitted copies to EPA and DEP in December 2021. The report shows that there has been an 87% reduction in CSOs in a typical year, from 3.3 billion gallons to 414 million gallons, with 70 of 86 outfalls meeting the LTCP goals for CSO activation frequency and volume. MWRA and its member CSO communities are moving forward with plans to bring 6 of the 16 CSOs in line with the LTCP goals. With respect to the remaining 10 CSO outfalls, MWRA identified potentially feasible alternatives that may enable four to achieve CSO LTCP volume and activation goals-

Progress on the work to comply with the court ordered levels of CSO control is discussed with the EPA/MassDEP at progress meetings held quarterly. Most recent quarterly meeting was on **9/22/22** and the next meeting scheduled for **12/22/22**.

As part of MWRA's CSO Control Program, MassDEP has issued a series of multi-year CSO variances that allow MWRA, Cambridge, and Somerville to continue to have limited CSO discharges to Alewife Brook and the Upper Mystic River, as well as the Charles River lower basin. The most recent variances, issued in 2019, require the development of Updated LTCPs for the CSO outfalls that each entity owns and operates that may discharge to the corresponding waterbody. The Updated LTCPs must include a description of the existing level of CSO control, an evaluation of the costs and the performance and water quality improvements achieved by additional CSO control alternatives, a public participation plan, and an affordability analysis. MassDEP and EPA conditionally approved MWRA's Updated CSO Control Plan Scope of Work and the Authority is currently working closely with the CSO communities of Cambridge and Somerville to develop these plans over the upcoming years.

Progress on the progress made as identified in the variance is reported at monthly meetings with EPA/MassDEP. The last meeting was on **10/12/22** and the next meeting is scheduled for **11/9/2022**. Key elements of the Updated CSO Control Plan discussed were the development of an Updated Typical year which includes climate change and the development of a Unified Model. **Next public meeting to be held the third week of December.**

Ongoing Projects as of September 30, 2022

Boston Water and Sewer Commission (BWSC)

- East Boston CSO Control: As part of the East Boston CSO financial assistance agreement executed in June 2021, BWSC is finalizing design of an upgraded connection to the MWRA system to lower CSO discharges at Outfall BOS014. MWRA has agreed to fund a portion of the work and has set up a FAA/MOU in the amount of \$2.1 million dollars to assist with the cost of the eligible construction. **FAA/MOU is effective form 7/1/2022 to 6/1/2023.**
- South Boston Sewer Separation: The South Boston sewer separation project includes five sewer separation contracts and two paving contracts. The five separation contracts are to be completed in 2027. The purpose of this project is to achieve CSO LTCP volume and activations goals and reduce pollution levels into Fort Point Channel and Boston Harbor from BOS070/DBC.
- Fort Point Channel and Mystic Confluence - BOS062, BOS065, BOS070 DBC and BOS017: Currently in design with substantial completion November 15, 2024 - MWRA portion not to exceed \$10 million. The purpose of this project is to bring four of the sixteen outfalls currently not forecast to attain LTCP in to compliance. Design commenced in October 2022, Final Design due September 2023, the construction contract will be advertise in November 2024 and shall be substantially completed in December 2024. On 10/19/2022 the BOD approved the request to enter into a new FAA/MOU with BWSC to fund up to \$10 million dollars of eligible design and construction costs. **The agreement and the account are being set up now for a 32 month term, from 10/1/2022 to June 30, 2025.**

City of Somerville

- Somerville Marginal Interceptor Rehabilitation: As part of a financial assistance agreement with Somerville, the City will repair 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 completed design and construction commenced in January 2022.

MWRA CSO Performance Assessment

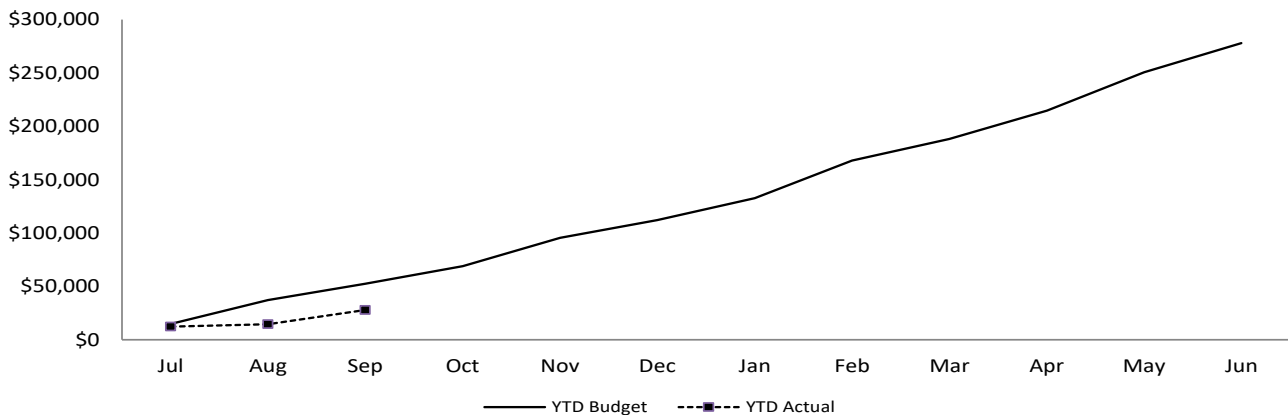
- In November 2017, MWRA signed a contract for CSO Post-Construction Monitoring and Performance Assessment with AECOM Technical Services, Inc. The contract includes CSO inspections, overflow metering, hydraulic modeling, system performance assessments and water quality impact assessments, culminating in the submission of a report to EPA and MassDEP in December 2021 verifying whether the LTCP goals are attained.
 - o AECOM continues to conduct receiving water quality modeling and CSO and stormwater sampling, evaluate additional CSO controls for those outfalls that do not meet the LTCP requirements, coordinate and draft the Updated CSO Control Plan mentioned above in relation to the variance water bodies, and develop an updated Typical Year CSO performance assessment relative to the LTCP activation and volume goals.

CIP Expenditures 1st Quarter – FY23

FY23 Capital Improvement Program Expenditure Variances through September by Program - (\$ in thousands)				
Program	FY23 Budget Through September	FY23 Actual Through September	Variance Amount	Variance Percent
Wastewater	\$17,582	\$9,505	(\$8,077)	-45%
Waterworks	\$30,625	\$14,700	(\$15,925)	-52%
Business and Operations Support	\$4,348	\$3,706	(\$643)	-14%
Total	\$52,555	\$27,910	(\$24,644)	-46%

Project underspending within Wastewater was due to timing of grant and loan distributions for the I/I Local Financial Assistance program, contractor behind schedule for the Nut Island Odor Control and HVAC Improvements, and completion of some design and inspection tasks were later than anticipated for Ward Street and Columbus Park Headworks Upgrades Design/CA. Project underspending in Waterworks was due to timing of community distributions for the Water Loan program, long lead time for piping material for Waltham Water Pipeline Construction, timing of work for WASM/SPSM Pressure Reducing Valves, and less than anticipated progress for CP-1 NEH Improvements. This underspending was partially offset by contractor progress for NIH Section 89 & 29 Replacement, and Wachusett Bastion Rehabilitation.

Budget vs. Actual CIP Expenditures (\$ in thousands)
Total FY23 CIP Budget of \$278,053



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 9/24/22	\$108.5 million
Unused capacity under the debt cap:	\$2.1 billion
Estimated date for exhausting construction fund without new borrowing:	Nov-22
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding:	\$ 90 million
Commercial paper capacity / Revolving Loan	\$160 million
Budgeted FY23 Cash Flow Expectancy*:	\$248 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

1st Quarter – FY23

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 coliforms, 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.

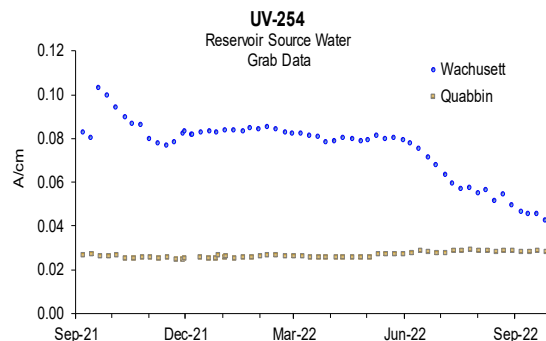
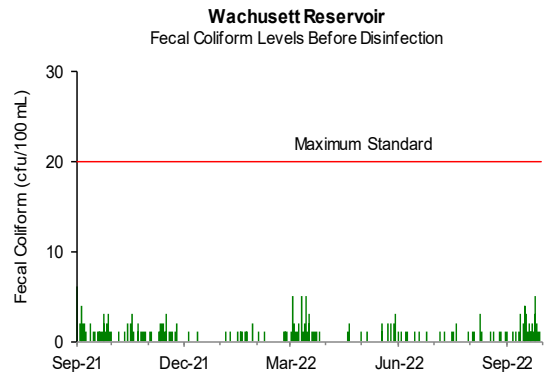
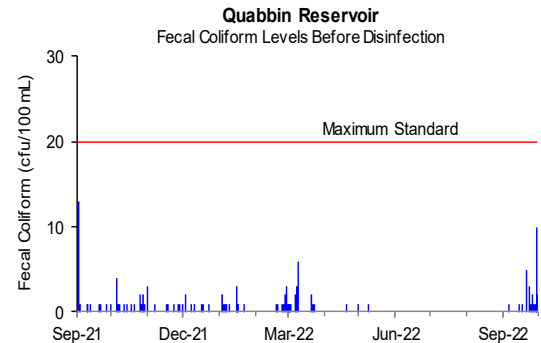
All samples collected during the 1st Quarter were below 20 cfu/100mL. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

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 0.028 A/cm for the quarter.

Wachusett Reservoir UV-254 levels averaged 0.052 A/cm for the quarter.



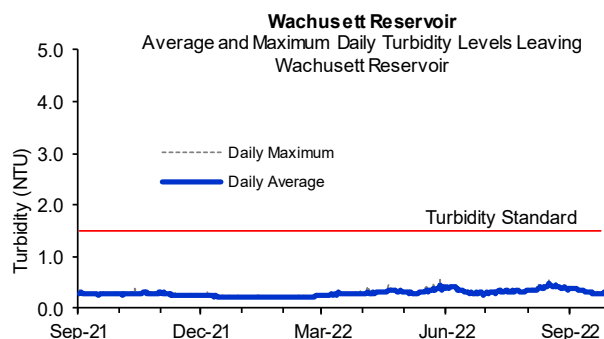
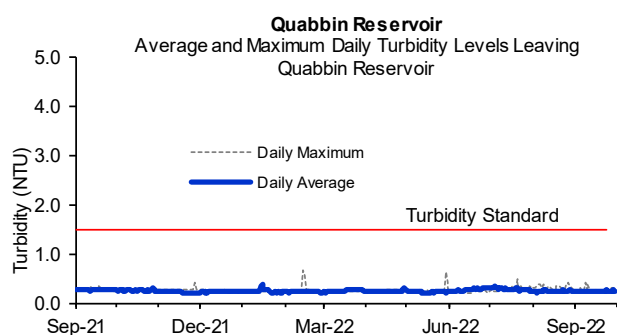
Source Water – Turbidity

1st Quarter – FY23

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.

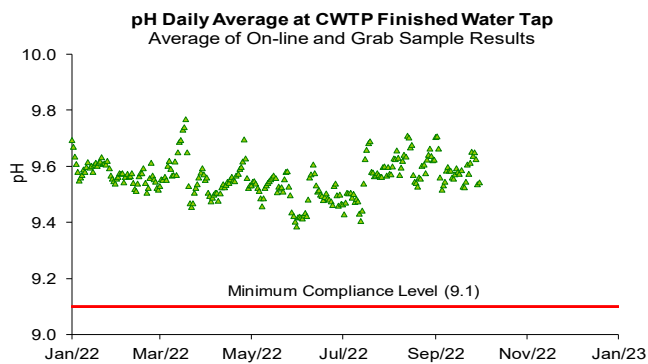
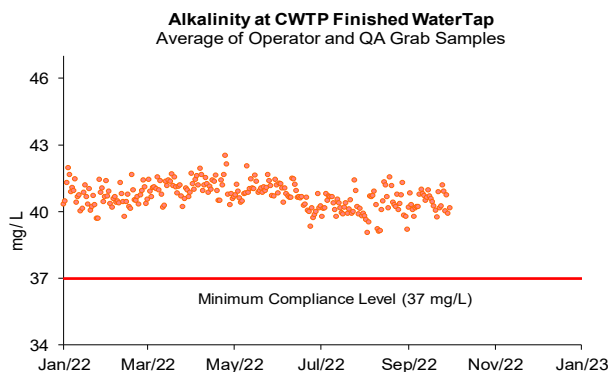


Treated Water – pH and Alkalinity Compliance

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 9.3 to 9.7 and alkalinity ranged from 39 to 42 mg/L. No sample results were below DEP limits for this quarter.



Treated Water – Disinfection Effectiveness

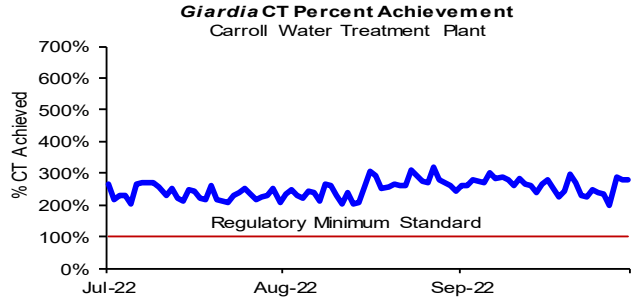
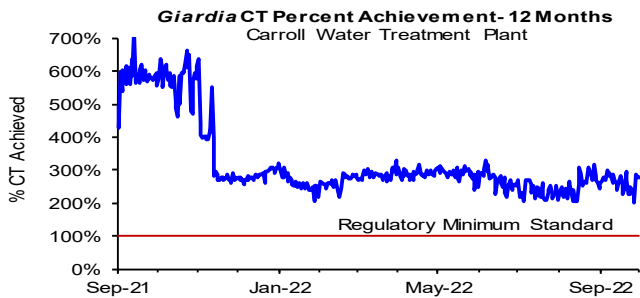
1st Quarter – FY23

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.

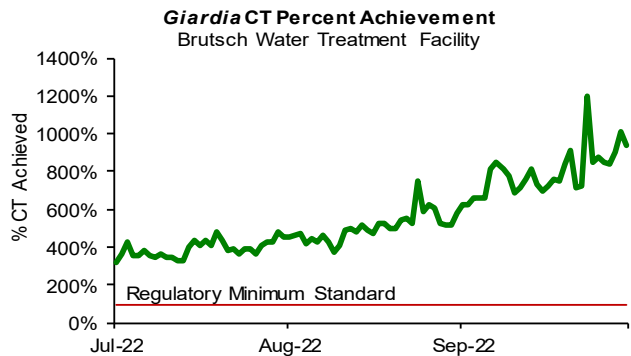
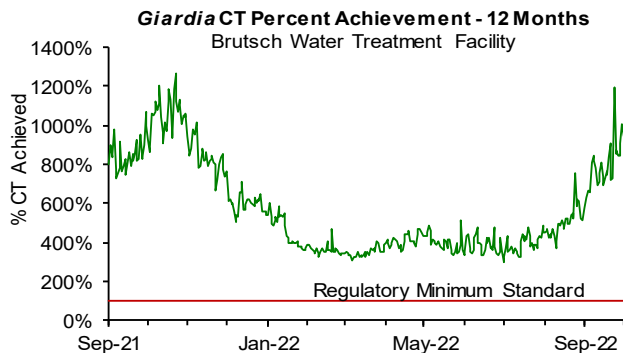
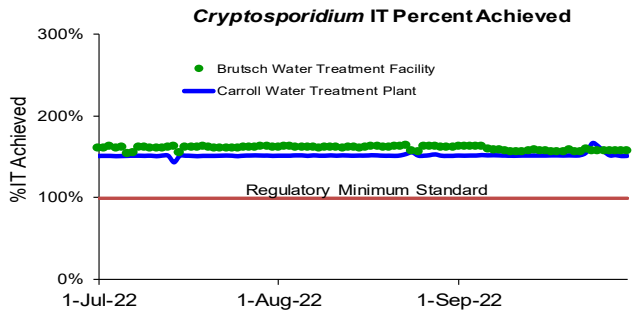
Wachusett Reservoir – MetroWest/Metro Boston Supply:

- The chlorine dose at the CWTP varied between 3.6 and 3.9 mg/L for the quarter.
- Ozone dose at the CWTP varied between 1.5 to 2.7 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 target was increased in mid-August 2021 through early November to reduce chlorine demand and decay, as during this time chlorine residuals 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 1.54 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%.



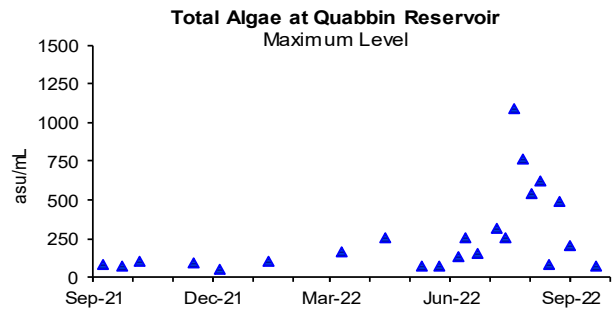
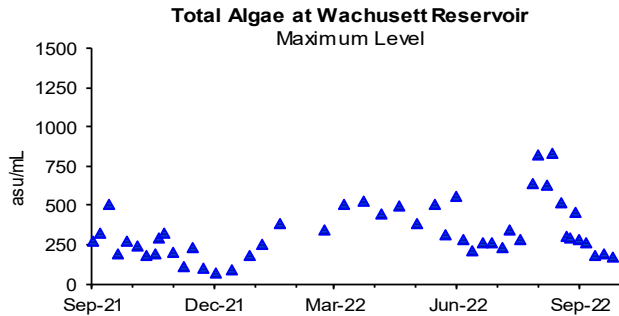
Source Water - Algae

1st Quarter – FY23

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.

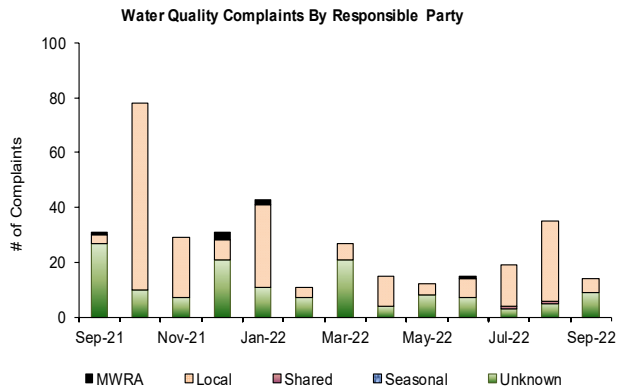
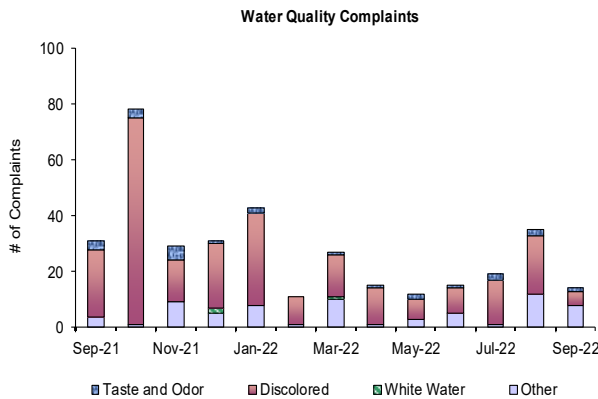


Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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 42 complaints during the quarter compared to 77 complaints from 1st Quarter of FY21. Of these complaints, 29 were for "discolored water", 4 were for "taste and odor", and 9 were for "other". Of these complaints, 22 were local community issues, 1 was an MWRA related issue, and 19 were unknown in origin.



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

1st Quarter – FY23

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 144 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.

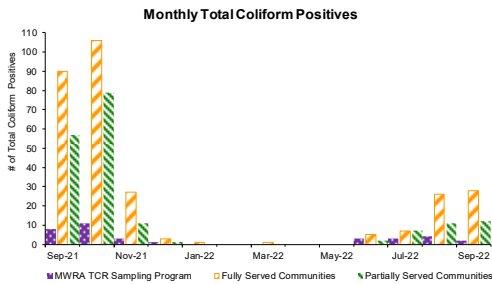
A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

Highlights

In the 1st Quarter, eighty-one of the 6,450 samples (1.26% system-wide) submitted to MWRA labs for analysis tested positive. Fourteen of the 1975 MWRA locations or Community/MWRA Shared samples (0.71%) tested positive for total coliform. Eleven of the 418 CVA/MWRA community samples tested positive for total coliform. Eleven communities were required to perform a Level 1 Assessment. In July, MWRA was required to conduct a Level 1 Assessment for the CVA system based on positive total coliform samples at Ludlow Monitoring Station. (Bedford, Burlington, Marlborough, Wilbraham, Winthrop – August; Milton, Newton, Southborough, Wakefield, Wilmington, Winthrop, Woburn – September). One sample in Wilmington, collected on September 7, tested positive for *E.coli*. A Boil Water Order was required and an automatic Level 2 Assessment will be conducted since repeat samples confirmed for total coliform. Only 0.3% 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.



		Total Coliform		<i>E.coli</i> Positive	# Assessment Required
		# Samples (b)	# (%) Positive		
MWRA	MWRA Locations	410	5 (1.22%)	0	
	Shared Community/MWRA sites	1565	9 (0.06%)	1	
	Total: MWRA	1975	14 (0.71%)	1	No
	ARLINGTON	169	0 (0%)	0	
	BELMONT	104	0 (0%)	0	
	BOSTON	795	5 (0.63%)	0	
	BROOKLINE	230	2 (0.87%)	0	
	CHELSEA	172	1 (0.58%)	0	
	DEER ISLAND	52	0 (0%)	0	
	EVERETT	169	0 (0%)	0	
	FRAMINGHAM	237	0 (0%)	0	
	LEXINGTON	117	0 (0%)	0	
	LYNNFIELD	18	0 (0%)	0	
	MALDEN	234	0 (0%)	0	
MARBLEHEAD	87	1 (1.15%)	0		
MARLBOROUGH	126	0 (0%)	0		
MEDFORD	210	10 (4.76%)	1	Yes	
MELROSE	117	0 (0%)	0		
MILTON	126	6 (4.76%)	0	Yes	
NAHANT	30	0 (0%)	0		
NEWTON	285	6 (2.11%)	0	Yes	
NORTHBOROUGH	51	1 (1.96%)	0		
NORWOOD	99	0 (0%)	0		
QUINCY	355	1 (0.28%)	0		
READING	130	0 (0%)	0		
REVERE	195	0 (0%)	0		
SAUGUS	104	0 (0%)	0		
SOMERVILLE	255	1 (0.39%)	0		
SOUTHBOROUGH	40	3 (7.50%)	0	Yes	
STONEHAM	91	0 (0%)	0		
SWAMPSCOTT	51	0 (0%)	0		
WALTHAM	217	1 (0.46%)	0		
WATERTOWN	130	0 (0%)	0		
WESTON	45	0 (0%)	0		
WINTHROP	96	23 (23.96%)	0	Yes	
Total: Fully Served	5137	61 (1.19%)			
Partially Served	BEDFORD	63	3 (4.76%)	0	Yes
	BURLINGTON	153	1 (2.56%)	0	No
	CANTON	88	0 (0%)	0	
	NEEDHAM	123	0 (0%)	0	
	PEABODY	207	0 (0%)	0	
	WAKEFIELD	151	7 (4.64%)	0	Yes
	WELLESLEY	114	0 (0%)	0	
	WILMINGTON	97	3 (3.09%)	1	Yes
	WINCHESTER	91	0 (0%)	0	
	WOBURN	226	6 (2.65%)	0	Yes
	Total: Partially Served	1313	20 (1.52%)		
Total: Community Samples No CVA		6450	81 (1.26%)		
CVA	MWRA CVA Locations	117	7 (5.98%)	0	Yes
	CHICOPEE	186	0 (0%)	0	
	SOUTH HADLEY FDI	63	1 (1.59%)	0	
	WILBRAHAM	52	3 (5.77%)	0	Yes
	Total: CVA	418	11 (2.63%)		

Chlorine Residuals in Fully Served Communities

	2021				2022								
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
% <0.1	0.7	0.9	0.5	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
% <0.2	2.8	3.1	1.7	0.8	0.1	0.2	0.0	0.0	0.1	0.0	0.1	0.3	0.4
% <0.5	12.3	10.9	7.4	2.8	1.1	1.1	0.5	0.6	0.5	0.5	1.4	1.6	1.8
% <1.0	27.9	26.2	15.7	7.3	3.7	4.1	2.3	2.3	2.1	2.6	4.0	5.7	6.5
% ≥ 1.0	72.1	73.8	84.4	92.7	96.3	95.9	97.7	97.7	97.9	97.4	96.0	94.3	93.5

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

1st Quarter – FY23

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.

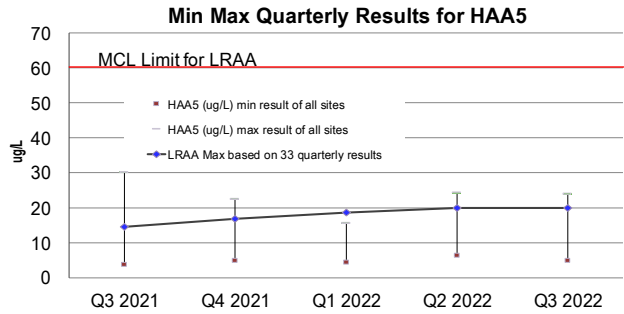
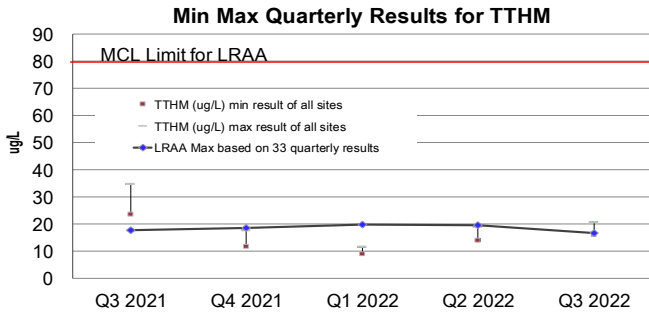
The locational running annual average calculated quarterly at each individual sampling location must be below the Total HAA5 or Total TTHM MCL standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

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.

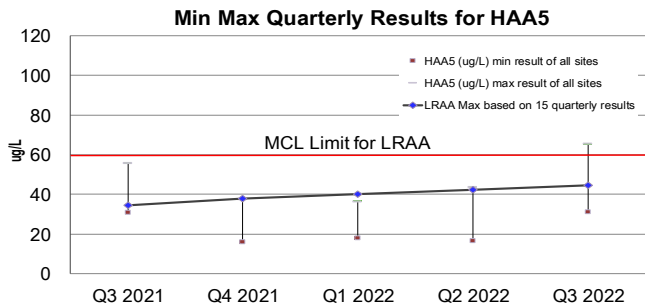
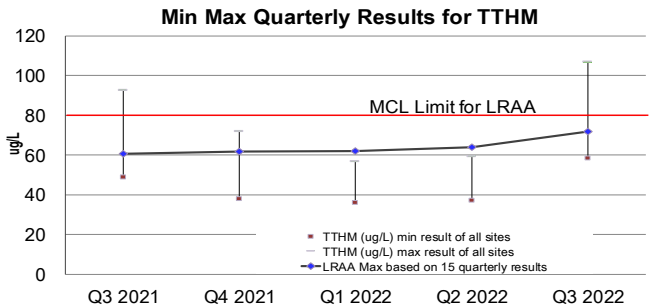
Bromate is tested monthly as required for water systems that treat with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA’s RAA MCL standard for bromate is 10 µg/L.

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 = 16.7 µg/L; HAA5s = 19.9 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

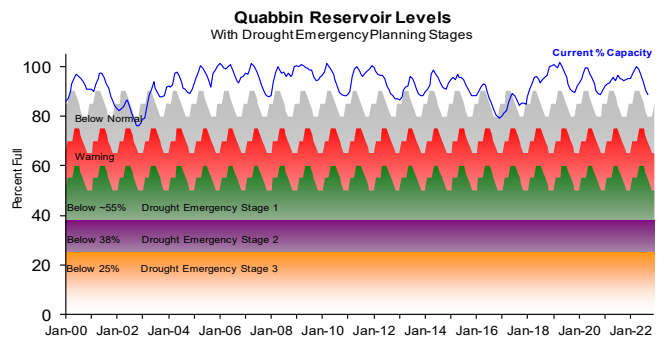
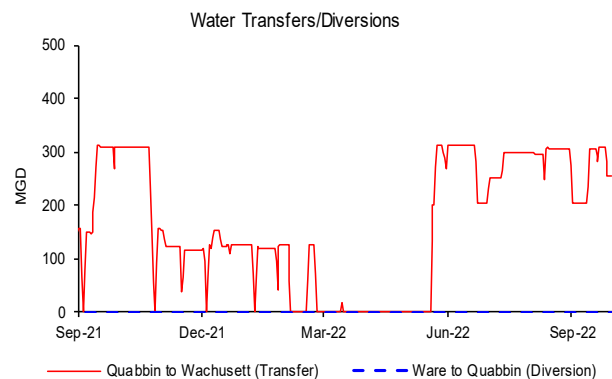
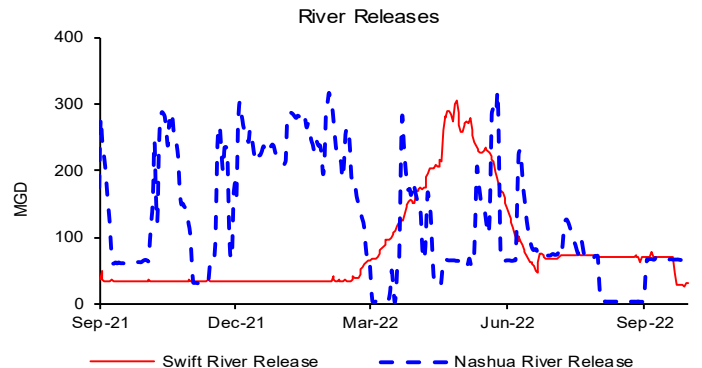
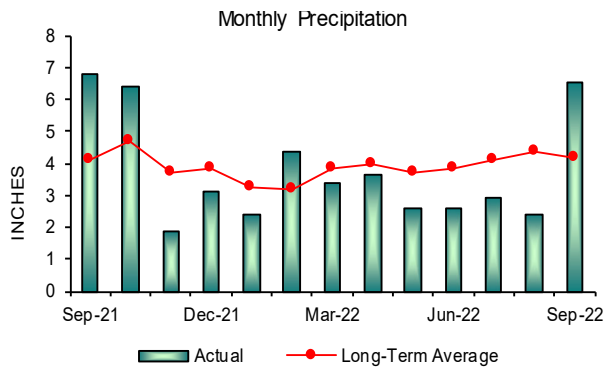
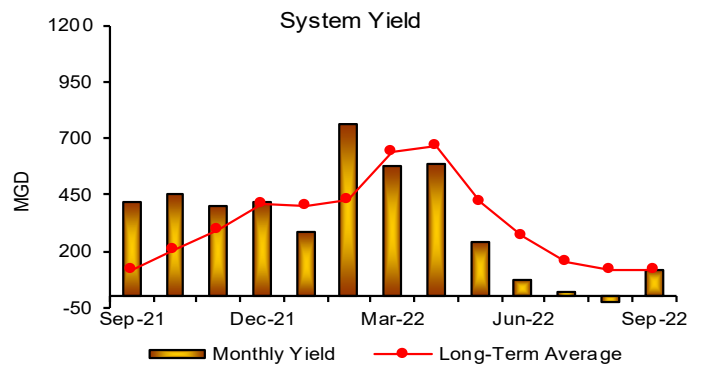
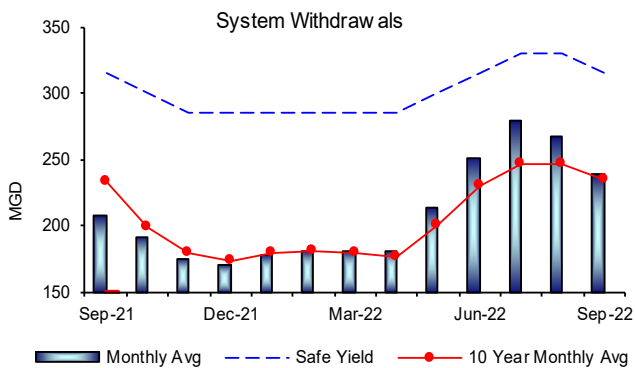
1st Quarter – FY23

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 88.8% as of September 30, 2022; a 7.6 % decrease for the quarter, which represents a loss of more than 31 billion gallons of storage and a decrease in elevation of 4.15'. System withdrawal, precipitation and yield were below their long term quarterly averages. Quabbin is in Normal Operating Range for this time of year.



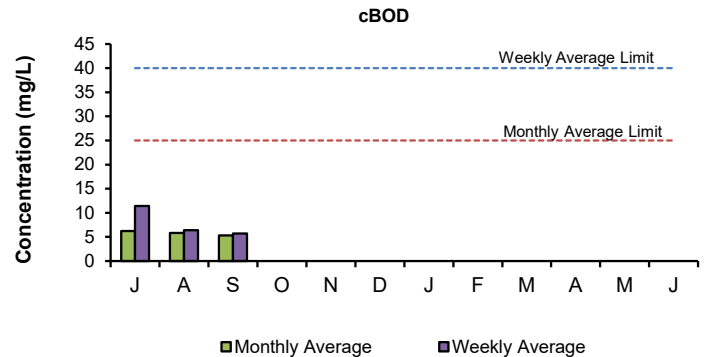
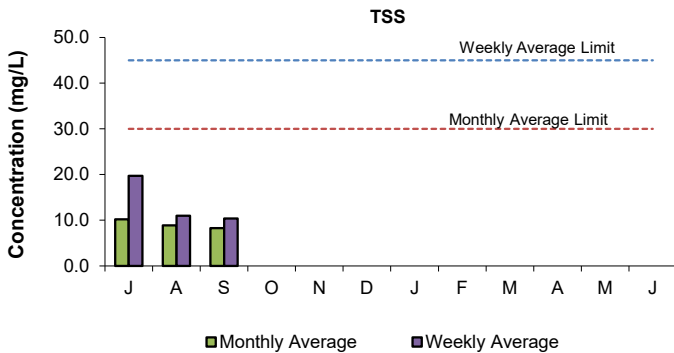
WASTEWATER QUALITY

NPDES Permit Compliance: Deer Island Treatment Plant 1st Quarter - FY23

NPDES Permit Limits

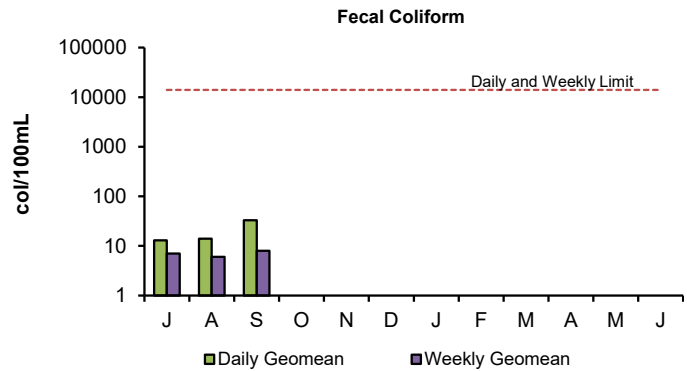
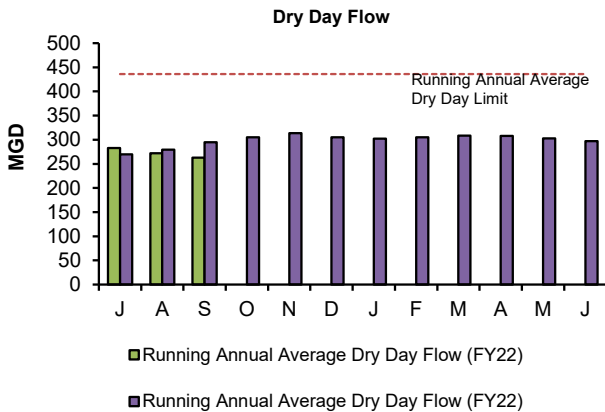
Effluent Characteristics	Units	Limits	July	August	September	1st Quarter Violations	FY23 YTD Violations	
Dry Day Flow (365 Day Average):	mgd	436	282.7	272.0	262.8	0	0	
cBOD:	Monthly Average	mg/L	6.2	5.8	5.3	0	0	
	Weekly Average	mg/L	11.4	6.4	5.7	0	0	
TSS:	Monthly Average	mg/L	10.2	8.9	8.3	0	0	
	Weekly Average	mg/L	19.7	11.0	10.4	0	0	
TCR:	Monthly Average	ug/L	0.4	0.0	0.0	0	0	
	Daily Maximum	ug/L	631	13.3	0.0	0	0	
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	13	14	33	0	0
	Weekly Geometric Mean	col/100mL	14000	7	6	8	0	0
	% of Samples >14000	%	10	0	0	0	0	0
	Consecutive Samples >14000	#	3	0	0	0	0	0
pH:	SU	6.0-9.0	6.5-7	6.5-6.9	6.5-6.9	0	0	
PCB, Aroclors:	Monthly Average	ug/L	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	50	0	0
	Inland Silverside	%	≥1.5	50	25	50	0	0

There have been no permit violations in FY23 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 - FY23

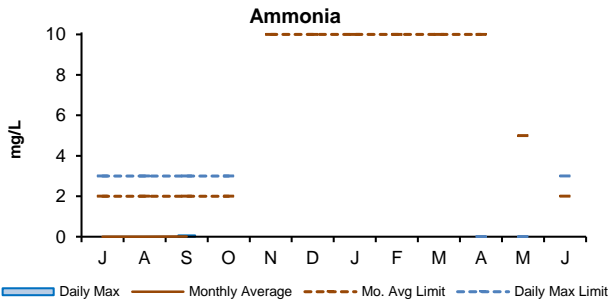
NPDES Permit Limits

Effluent Characteristics		Units	Limits	July	August	September	1st Quarter Violations	FY23 YTD Violations
Flow:	12-month Rolling Average:	mgd	3.01	3.02	2.90	2.69	1	1
BOD:	Monthly Average:	mg/L	20	1.50	1.40	1.30	0	0
	Weekly Average:	mg/L	20	1.90	1.60	1.60	0	0
TSS:	Monthly Average:	mg/L	20	1.20	1.50	1.50	0	0
	Weekly Average:	mg/L	20	1.80	2.40	1.70	0	0
pH:		SU	6.5-8.3	7.3-7.8	7.2-7.8	7.3-7.8	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	8.10	8.10	8.30	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	5	5	5	0	0
	Daily Geometric Mean:	cfu/100mL	409	5	7	23	0	0
TCR:	Monthly Average:	ug/L	17.6	0.13	0.11	0.00	0	0
	Daily Maximum:	ug/L	30.4	4.00	3.33	0.00	0	0
Copper:	Monthly Average:	ug/L	11.6	12.45	12.25	9.82	2	2
	Daily Maximum:	ug/L	14.0	12.70	12.30	10.70	0	0
Total Ammonia Nitrogen: June 1st - October 31st	Monthly Average:	mg/L	2.0	0.00	0.00	0.01	0	0
	Daily Maximum:	mg/L	3.0	0.00	0.00	0.07	0	0
Total Phosphorus: April 1st - October 31st	Monthly Average:	ug/L	150	97	71	49	0	0
	Daily Maximum:	ug/L	RPT	173	183	150	0	0
Acute Toxicity*:	Daily Minimum:	%	≥100	N/A	N/A	>100	0	0
Chronic Toxicity*:	Daily Minimum:	%	≥62.5	N/A	N/A	12.5	1	1

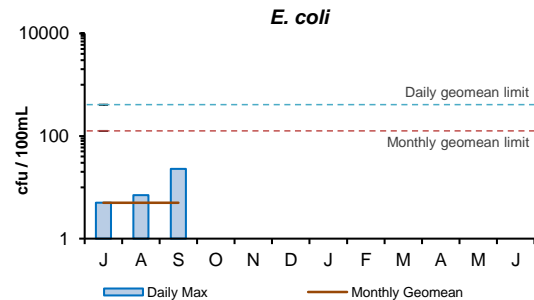
There have been four permit violations in FY23 at the Clinton Treatment Plant.

1st Quarter: There were four permit violations in the first quarter. In July, plant flows exceeded the 12-month rolling average. July and August copper monthly averages exceeded the permit limit of 11.6 ug/L. The quarterly chronic toxicity result of 12.5% was below the minimum permit limit of 62.5%.

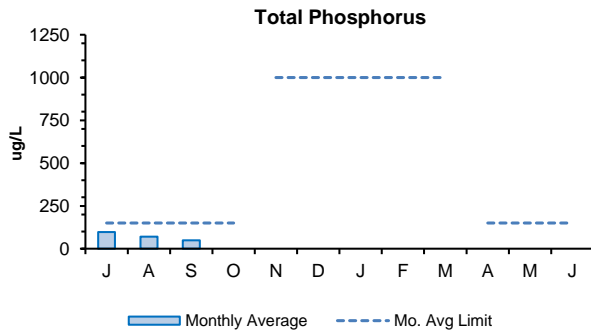
+ Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



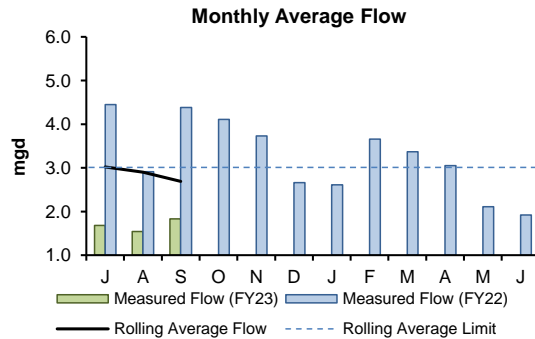
The 4th Quarter's monthly average and daily maximum concentrations of ammonia were below the permit limits. The monthly average and daily maximum limits for the 4th Quarter are 2.0 and 3.0 mg/L respectively. The permit limits are most stringent from June to October when warm weather conditions are most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



E. coli is an indicator for the possible presence of pathogens. There were no violations of permit limits in the 4th 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 4th Quarter's monthly average concentrations for total phosphorus were below permit limits.



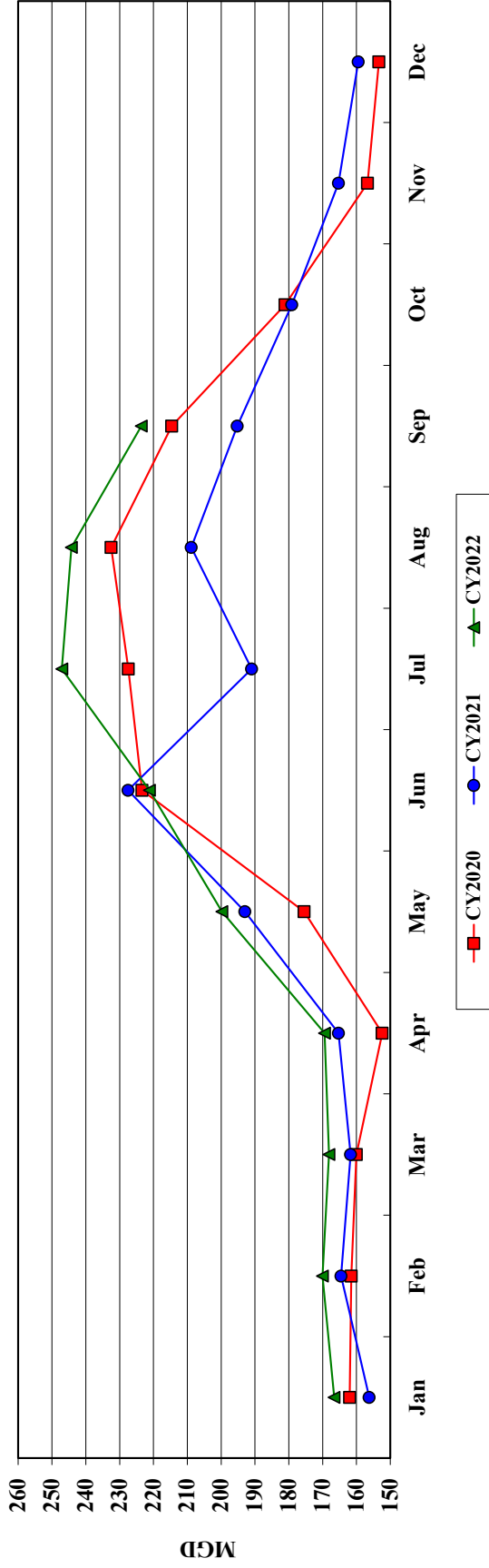
The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The 12-month rolling average flows during the 4th Quarter were below the permit limit.

COMMUNITY FLOWS AND PROGRAMS

Customer Water Use

1st Quarter - FY23

MWRA Water Supplied: All Revenue Customers



MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2020	162.016	161.551	160.018	152.368	175.435	223.405	227.454	232.496	214.617	181.110	156.727	153.367	190.061	183.462
CY2021	156.213	164.567	161.697	165.284	192.998	227.522	190.945	208.810	195.229	179.116	165.302	159.442	184.907	180.641
CY2022	166.570	170.056	168.107	169.415	199.769	221.149	247.087	244.267	223.603	-	-	-	201.415	201.415

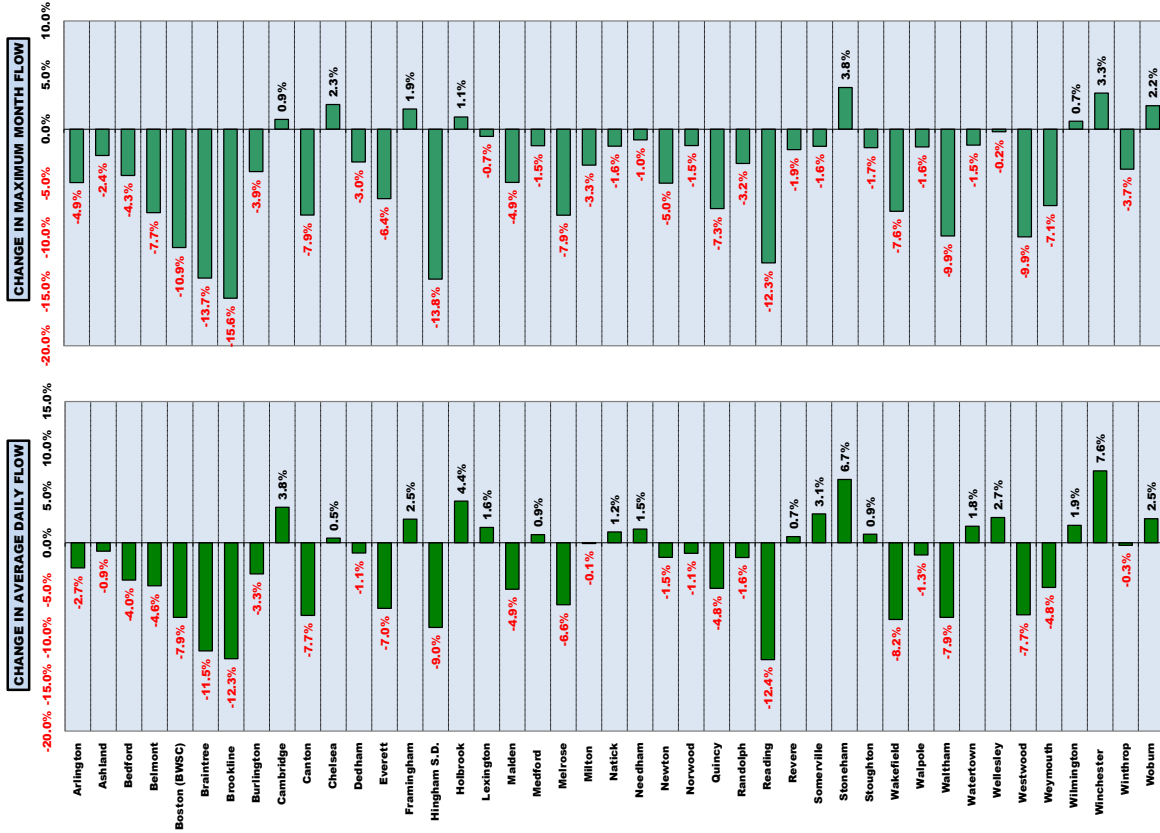
MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Total	Annual Total
CY2020	5,022.510	4,684.968	4,960.567	4,571.025	5,438.470	6,702.146	7,051.078	7,207.384	6,438.520	5,614.399	4,701.821	4,754.375	52,076.668	67,147.263
CY2021	4,842.593	4,607.873	5,012.608	4,958.533	5,982.944	6,825.661	5,919.300	6,473.120	5,856.857	5,552.611	4,959.064	4,942.705	50,479.491	65,933.870
CY2022	5,163.682	4,761.563	5,211.326	5,082.449	6,192.845	6,634.472	7,659.688	7,572.270	6,708.080	-	-	-	54,986.375	54,986.375

The September 2022 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 2022 water use will be used to allocate the FY2024 water utility rate revenue requirement.

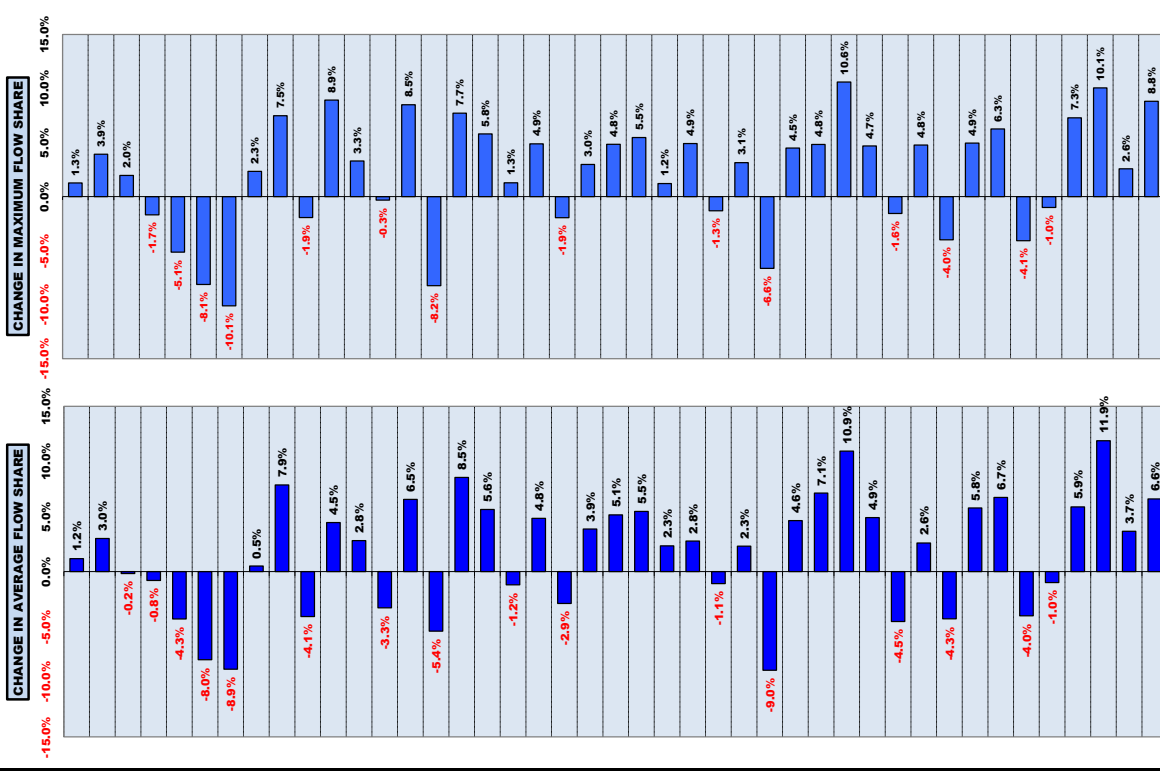
MWRA customers used an average of 238.48 mgd in the 1st quarter (Jul-Sep 2022) of FY2023. This is an increase of 26.81 mgd or 12.7% compared to the average of the 1st quarters in FY2020 and FY2021. The City of Cambridge used 438.31 million gallons in the first quarter, and averaged 13.96 mgd in September.

How CY2020-22 Community Wastewater Flows Could Effect FY2024 Sewer Assessments ^{1,2,3}

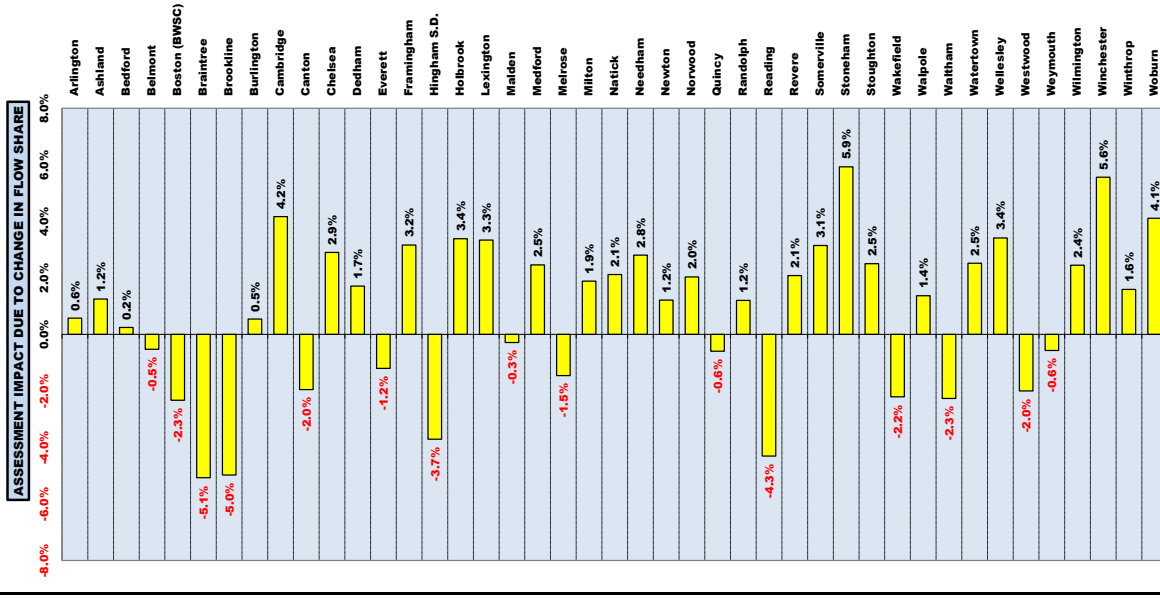
The flow components of FY2024 sewer assessments will be calculated using a 3-year average of CY2020 to CY2022 wastewater flows compared to FY2023 assessments that will use a 3-year average of CY2019 to CY2021 wastewater flows.



But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2020 to CY2022 flow share compared to CY2019 to CY2021 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 smoothes the impact of year-to-year changes in community flow share, but does not eliminate the long-term impact of changes in each community's relative contribution to the total flow.

² Based on actual flows for 2019 and 2022 (through June), 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 estimated 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.

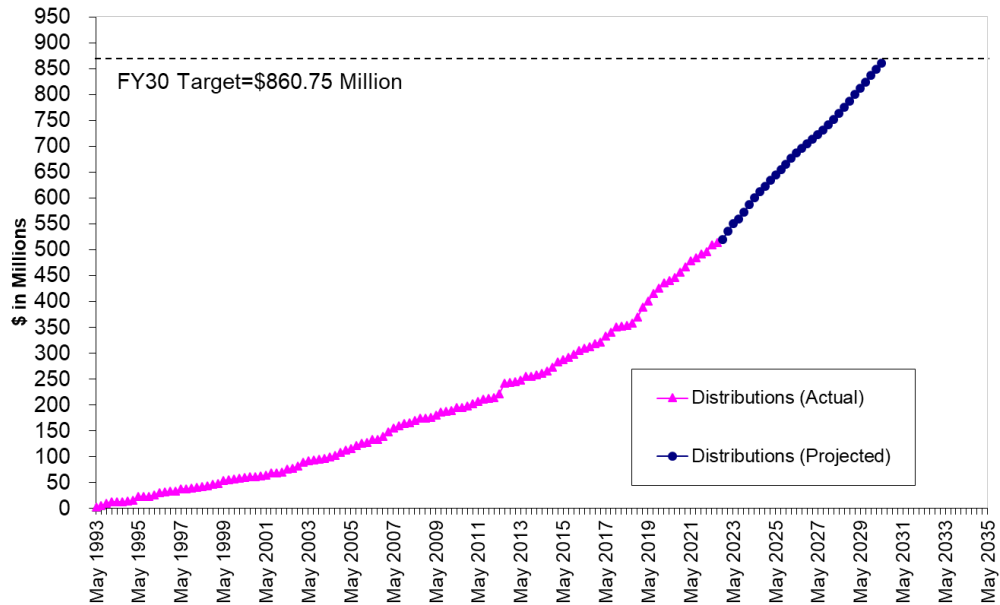
Community Support Programs

1st Quarter – FY23

Infiltration/Inflow Local Financial Assistance Program

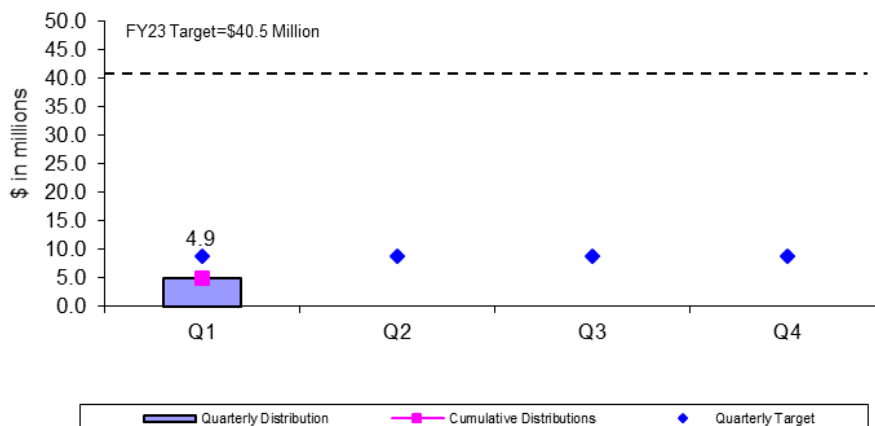
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides \$860.75 million in grants and interest-free loans (average of about \$22 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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. Phase 14 funds (total \$100 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period.

I/I Local Financial Assistance Program Distribution FY93-FY30



During the 1st Quarter of FY23, \$4.9 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Holbrook, Quincy, Revere and Weymouth. Total grant/loan distribution to date for FY23 is \$4.9 million. From FY93 through 1st Quarter of FY23, all 43 member sewer communities have participated in the program and \$515 million has been distributed to fund 648 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.

FY23 Quarterly Distributions of Sewer Grant/Loans



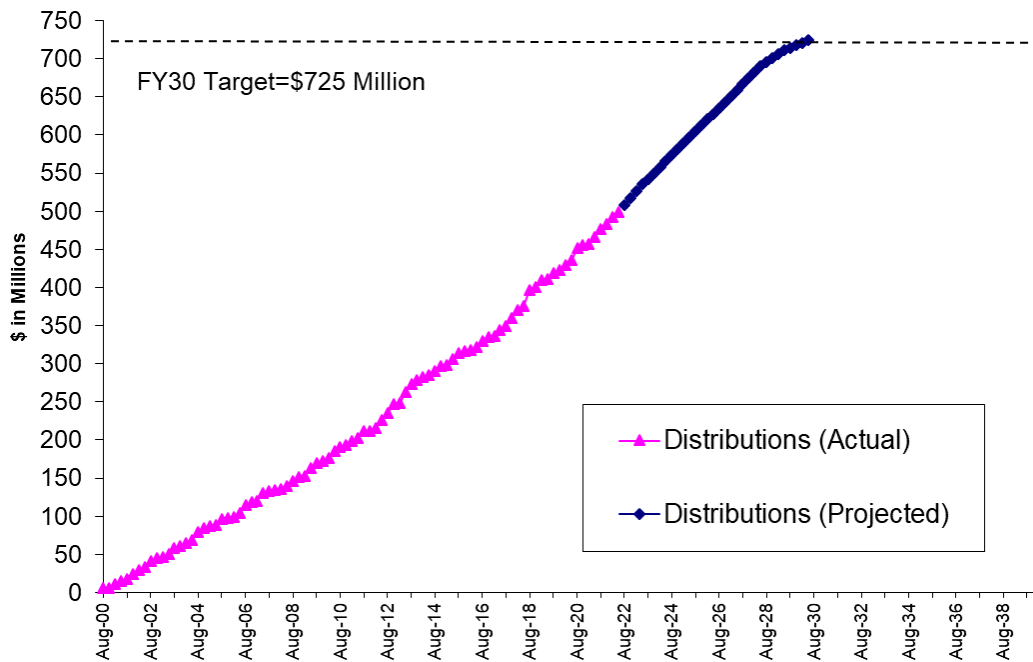
Community Support Programs

1st Quarter – FY23

Local Water System Assistance Program

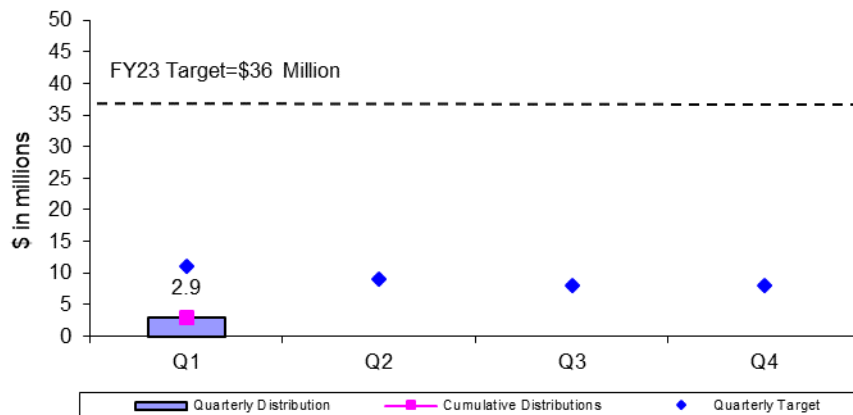
MWRA's Local Water System Assistance Programs (LWSAP) provides \$725 million in interest-free loans (an average of about \$24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There 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 FY25. 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 FY23, \$2.9 million in interest-free loans was distributed to fund local water projects in Belmont, Norwood, Stoughton, and Watertown. Total loan distribution to date for FY23 is \$2.9 million. From FY01 through the 1st Quarter of FY23, \$502 million has been distributed to fund 505 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.

FY23 Quarterly Distributions of Water Loans



Community Support Programs

1st Quarter – FY23

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.

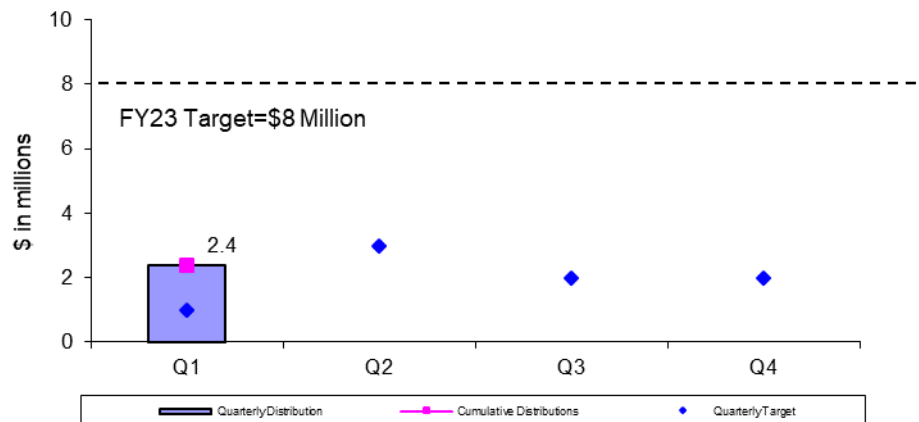
FY22 is the sixth year of the Lead Loan Program – MWRA made six Lead Loans.

FY23 is the seventh year in the Lead Loan Program – MWRA made three Lead Loans in the first quarter.

Summary of Lead Loans:

Reading in FY23	\$1.5 Million	Marlborough in FY19	\$1.0 Million
Watertown in FY23	\$0.3 Million	Winthrop in FY19	\$0.5 Million
Winchester in FY23	\$0.6 Million	Chelsea in FY19	\$0.1 Million
Everett in FY22	\$1.5 Million	Everett in FY19	\$1.0 Million
Boston in FY22	\$0.9 Million	Needham in FY18	\$1.0 Million
Winthrop in FY22	\$0.8 Million	Winchester in FY18	\$0.5 Million
Somerville in FY22	\$1.6 Million	Revere in FY18	\$0.2 Million
Revere in FY22	\$1.3 Million	Winthrop in FY18	\$0.3 Million
Chelsea in FY22	\$0.3 Million	Marlborough in FY18	\$1.0 Million
Watertown in FY21	\$0.6 Million	Newton in FY17	\$4.0 Million
Marlborough in FY21	\$2.0 Million	Quincy in FY17	\$1.5 Million
Everett in FY21	\$1.5 Million	<u>Winchester in FY17</u>	<u>\$0.5 Million</u>
Boston in FY21	\$2.6 Million	TOTAL	\$34 Million
Winthrop in FY21	\$0.8 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		

FY23 Quarterly Distributions of Lead Service Line Replacement Loans

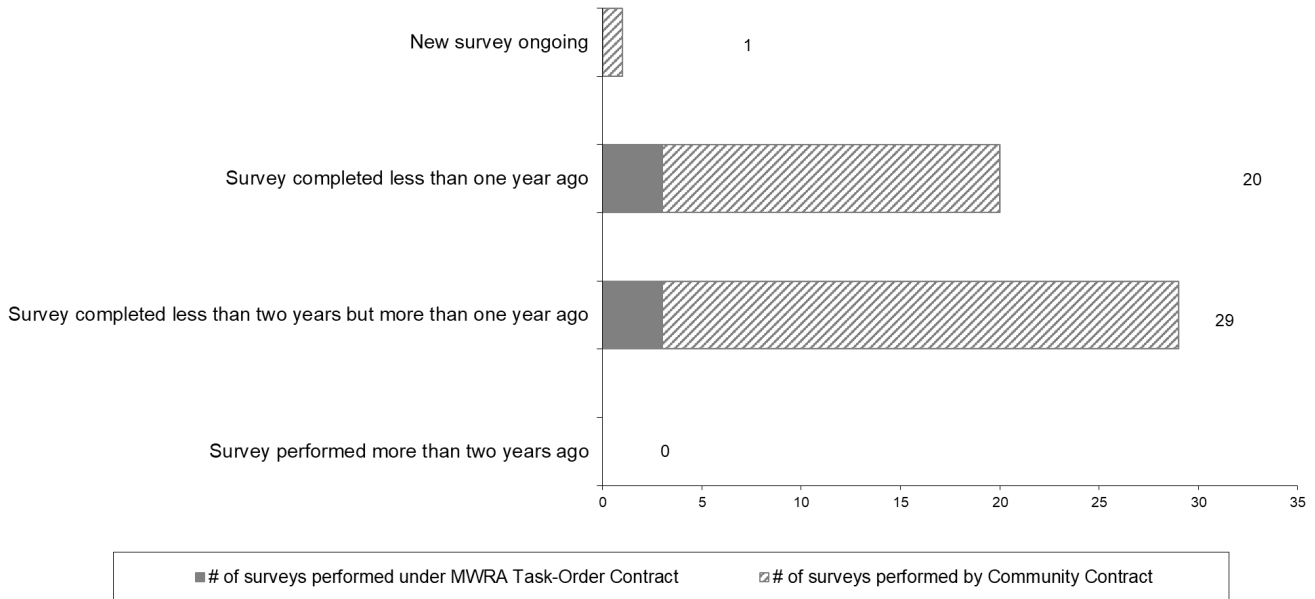


Community Support Programs

1st Quarter – FY23

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 FY23, 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, and toilet leak detection dye tabs), 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	9,985				9,985
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	2,302				2,302
Toilet Leak Detection Dye Tablets	_____	1,151				1,151

BUSINESS SERVICES

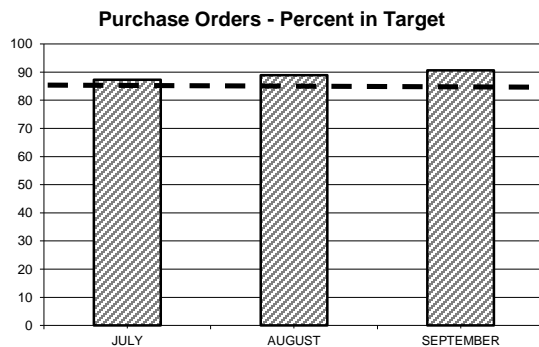
Procurement: Purchasing and Contracts

1st Quarter - FY23

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

Outcome: Processed 91% of purchase orders within target; Average Processing Time was 5.66 days vs. 4.75 days in Qtr 1 of FY22. Processed 11% (1 of 9) of contracts within target timeframes; Average Processing Time was 264 days vs. 207 days in Qtr 1 of FY22.

Purchasing



	No.	TARGET	PERCENT IN TARGET
\$0 - \$500	448	3 DAYS	85.0%
\$500 - \$2K	537	7 DAYS	95.7%
\$2K - \$5K	515	10 DAYS	94.9%
\$5K - \$10K	51	25 DAYS	78.4%
\$10K - \$25K	64	30 DAYS	75.0%
\$25K - \$50K	14	60 DAYS	85.7%
Over \$50K	33	90 DAYS	84.8%

The Purchasing Unit processed 1662 purchase orders, 35 less than the 1697 processed in Qtr 1 of FY22 for a total value of \$20,155,610 versus a dollar value of \$14,524,801 in Qtr 1 of FY22 .

The purchase order processing target was not met for the \$5K - \$10K category due to vendor registration requirements and end user confirmations and the \$10K - \$25K category due to end user confirmations, specification development and vendor response delays.

Contracts, Change Orders and Amendments

Procurement executed nine contracts with a value of \$23,371,557 and three amendments with a value of \$250,000. Eleven change orders were executed during the period. The dollar value of all non-credit change orders during Qtr 1 of FY23 was \$159,993 and the value of credit change orders was (\$470,442).

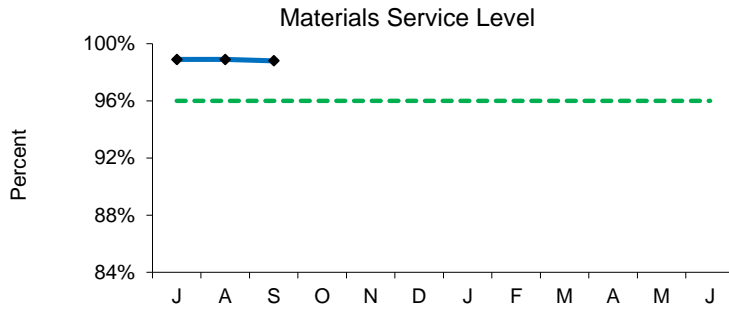
Eight contracts were not executed within the target timeframes. Two contracts were delayed due to additional procurement requirements necessary for insurance services. Insurance for all categories of coverage was obtained timely and according to schedule. Another contract was delayed due to the need for a bid review with the contractor in addition to negotiations with the local municipality regarding scope and funding. A fourth contract was delayed due to specification review which took longer than anticipated.

Several contracts were delayed due to reduced staffing due to retirement, and consultant proposed contract language changes for one of the contracts. Another contract was delayed due to a longer than anticipated sub bid and general bid qualification process. The final contract was delayed due to changes in scope and cost, and contractor questions that led to a bid date extension.

Staff reviewed 29 proposed change orders and 11 draft change orders.

Materials Management

1st Quarter - FY23



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 6,116 (98.8%) of the 6,190 items requested in Q1 from the inventory locations for a total dollar value of \$1,450,218.

Inventory Value - All Sites

Inventory goals focus on:

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

The FY22 goal is to reduce consumable inventory from the July '22 base level (\$8.3 million) by 2.0% (approximately \$167,437), to \$8.2 million by June 30, 2023.

Items added to inventory this quarter include:

- Deer Island – gloves, hardhats, lamps, inspection tags, equipment labels for Safety; o-rings and gear reducers for Maintenance; valves, transformer contact kit, valves and pressure switches for Electrical; pull handles and rotating hasps for Facilities.
- Chelsea – equipment labels, inspection tags and equipment tags for Safety; PH sensors for SCADA; Degreaser for Work Coordination; pipe saw blades Operations & Maintenance.
- Southboro – hardhats and headlamps for Safety; valve rebuild kits for Plumbers; gloves for Operations & Maintenance.

Property Pass Program:

- Nine audits were conducted during Q1.
- Scrap revenue received for Q1 amounted to \$7,876. Year to date revenue received amounted to \$7,876.
- Revenue received from online auctions held during Q1 amounted to \$106,251. Year to date revenue received amounted to \$106,251.

Items	Base Value July-22	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,371,867	8,259,525	-112,342
Spare Parts	9,447,310	9,559,332	112,022
Total	17,819,177	17,818,857	-320

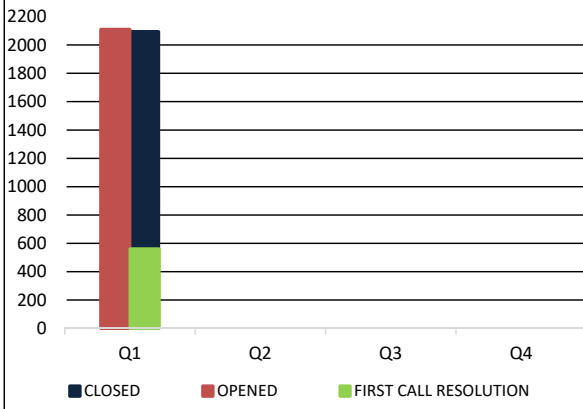
Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

MIS Program

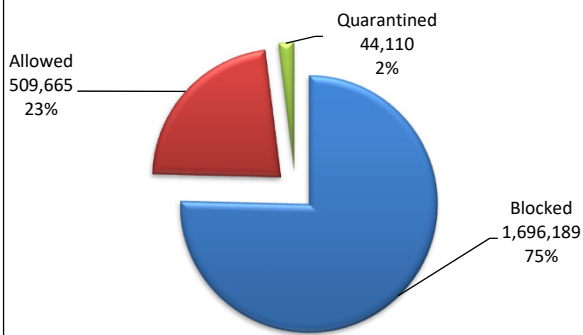
1st Quarter – FY23

Numbers & Statistics

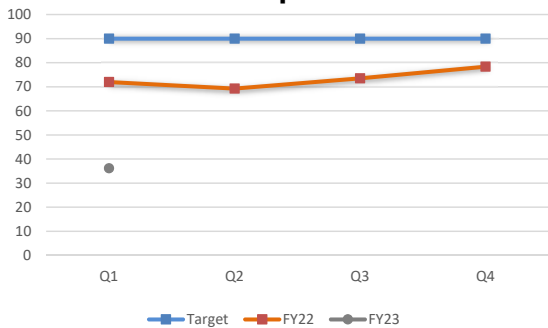
Monthly Call Volume



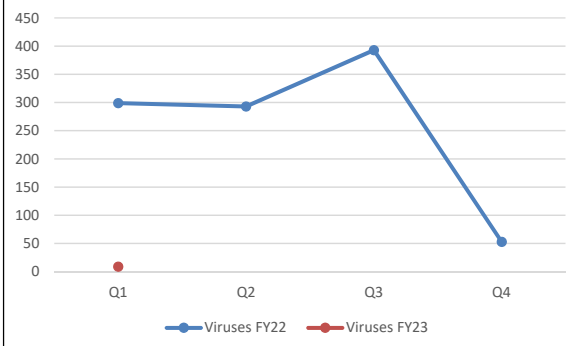
Emails Received: 2,249,964



PC Compliance



Viruses Caught by CrowdStrike



Project Updates

Infrastructure & Security

Managed Security Services Contract: The new contract was awarded in September to NWN Carousel. NTP & go-live are on schedule to complete during Q2.

Firewall Replacement: New Fortinet firewalls are in place in Chelsea, and their rules have been reviewed, edited, and optimized after conversion. Firewalls for Deer Island and remote sites are being configured and will be rolled out during Q2.

Identity and Access Management: Okta's multi-factor authentication (MFA) solution was implemented authority wide, replacing the less secure DUO MFA.

Forticlient VPN Solution: Fortinet VPN has been implemented. MIS began migrating all users and vendors to the new Fortinet solution. This process will continue into Q2. New, larger VPN devices have been ordered and received to accommodate the increased number of total VPN users, as we transition away from Citrix. Upgrade to the new devices to complete in Q2.

PBX (Telephone System Upgrade): VOIP phones roll-out, which started in Q4 of FY22, have been completed (with the exception of DITP). Cabling and other required infrastructure upgrades that started during FY22 will continue through 2023.

Expansion of Wi-Fi Networking: Wireless is now available at Chelsea, Charlestown, Southboro, NI conference room, Clinton (front offices & conf. room), CWTP conference room, DITP RT building (Admin/lab 1 & 2 to be completed with construction) and Belchertown.

Other Software & Custom Applications

Learning Management System: The LMS went live in August, and is fully rolled out for all MWRA employees. The project moved from the Infor implementation team to their support team.

ECM/Electronic Document Management: Cadence and Subject Matter Experts met and determined that more work will be needed to configure the functionality required. Significant effort was put into this re-configuration and testing, and we expect this phase to wrap up in October or November. Continued to work on data preparation for full data migration.

BOE Upgrade: The vendor Qlarion completed upgrading the Business Objects Enterprise development and production servers to version 4.3 and worked with the ENQUAL department to prioritize the Oracle Discoverer reports to be migrated to the new BOE Webi environment.

Maximo/Lawson Interface: The vendor Starboard Consulting completed working with staff to re-write the business rules of the Lawson-Maximo interface to reduce the number of failed transactions that currently must be resolved manually by the Maximo administrator.

Lawson ERP Upgrade: MIS continues to work on drafting the upgrade RFQP and has help multiple discovery sessions with Workday, another ERP vendor, during this quarter.

Library, Record Center, & Training

Library: Undertook 15 research requests, supplied 21 books for circulation, provided 14 new books and 10 new standards. The MWRA Library Portal supported 726 end user searches, including: Ashland MA original sewage system, Frederick Stearns/damming of the Nashua River (1880s), history of chlorination in the metropolitan water system..

Record Center (RC): The Record Center added 276 new boxes, handled 489 total boxes, and shredded (36) 65 gallon bins and (8) 96 gallon bins of confidential documentation on-site. It performed 117 database/physical box searches for multiple departments on various topics, including administrative info, law cases, and project docs for Engineering.

Training: In Q1, 52 online IT lessons were taken, by 20 employees, spanning 75 hours (75 YTD). 0 standard class lessons were taken. 0 outside certifications were earned.

Legal Matters
1st Quarter FY 2023

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits and License Agreements:** Reviewed one hundred (100) 8(m) permits. Drafted one-day license for Nut Island. Reviewed Direct Connect Permit. Finalized draft amendment 1 to the Town of Northborough public access 8(m) permit. Reviewed New Cingular wireless renewal agreement for Walnut Hill water tank.
- **Real Property:** Drafted lease for Core Storage Facility for Tunnel Redundancy. Drafted and finalized first amendment to Walpole records center lease. Completed review of DCR watershed acquisition package for W-001236 in Petersham and Barre, MA. Drafted and finalized license from UMass to MWRA allowing for geophysical survey in support of Tunnel Redundancy Program. Reviewed land acquisition needs for MWRA Contract 6224 - Siphon and Junction Structure Rehabilitation. Reviewed lease terms with respect to requirements for permanent fixtures and business fixtures upon termination of lease. Prepared response with respect to the removal of certain security equipment at termination of lease. Reviewed property rights for parcel(s) in Southborough and in Newton, MA. Drafted and finalized Memorandum of Agreement between MWRA and the Town of Ludlow regarding construction and ownership of an antenna tower at Nash Hill Reservoir for communication equipment. Researched Clinton WTP property rights for tree plantings. Drafted notice letter for access over private property concerning boring work in Newton pursuant to statutory right of entry. Reviewed property rights for parcels of interest for Tunnel Redundancy Program. Researched Article 97 restrictions for two separate MWRA projects.
- **Energy:** Prepared a summary of recent Commonwealth energy legislation, Chapter 179 of the Acts of 2022, *An Act Driving Clean Energy and Offshore Wind*, including items relevant to MWRA operations. Assisted energy team with Site Host Agreement with local electrical utility regarding electric vehicle charging infrastructure at MWRA facility. Provided ongoing legal support the energy group regarding updates to the Cosgrove and Oakdale Hydro facilities' Interconnection Services Agreements with National Grid and associated interconnection processes. Review of HEEC information request filings in D.P.U. 22-56, *Petition of Harbor Electric Energy Company for approval by the Department of Public Utilities of its Capacity and Support Charge True-Up Adjustment for 2021*.
- **Environmental/NPDES:** Assisted TRAC with preparation of various documents, , and permitting templates. Assisted TRAC/Lab with response to request for data. Reviewed a Memorandum of Agreement with the Massachusetts Historical Commission. Provided legal support for Medium Wastewater Treatment Facility General NPDES Permit related to MWRA's Clinton Wastewater Treatment Facility and for Deer Island Wastewater Treatment Plant's NPDES permit renewal.
- **Miscellaneous:** Reviewed documents for submission to Records Conservation Board for disposal. Updated commonly used codes for reference guide using the current edition of the Massachusetts Statewide Records Retention Schedule. Drafted memorandum on archiving, scanning and purging records in compliance with the Massachusetts Statewide Records Retention Schedule. Finalized Professional Services Agreement for use in procuring

consultant services. Drafted professional Rules of Conduct memorandum. Reviewed bills SB3074 and HB4250 for completeness. Reviewed legislation related to certain easements at Hingham Pump Station and legislation related to release of sewer access easement at 777 Dedham Street in Canton. Further advised on certain prevailing wage law issues. Review of procurement documents for Metropolitan Water Tunnel Program lease for core storage facility. Reviewed MWRA Enabling Act Section 8(k) and drafted correspondence for use in securing electrical inspection for Chelsea Facility by DPS. Reviewed agreements for Deer Island Treatment Plant's demand response program, and terms of MWRA Contract numbers S590 and S594 concerning request for release of parental guarantee. Assisted with revisions to OP.10, *Admission of New Community to MWRA Water System*, regarding water supply entrance fees.

- **Public Records Requests:** During the 1st Quarter of FY23, MWRA received and responded to one hundred fifty-seven (157) public records requests.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

Unemployment appeal involving a former employee who alleges he resigned due to a medical condition.

Matters Concluded

Received an arbitrator's decision in favor of the MWRA following a hearing regarding a grievance alleging that it violated a collective bargaining agreement when employee was working out of title.

Received an arbitrator's decision in favor of the MWRA following a hearing regarding a grievance alleging that it violated a collective bargaining agreement when employee was not selected for promotion.

Received an arbitrator's decision in favor of the Union following a hearing regarding a grievance alleging that the MWRA violated a collective bargaining agreement when employee was suspended for three days.

Received an arbitrator's decision in favor of the Union following a hearing regarding a grievance alleging that the MWRA violated a collective bargaining agreement by reclassifying a position without bargaining over the pay rate.

A Union withdrew a demand for arbitration regarding a grievance alleging that MWRA violated a collective bargaining agreement when an employee was demoted.

A Union withdrew a charge of prohibited practice at the Massachusetts Department of Labor Relations alleging the MWRA violated Chapter 150E when it announced it would not bargain over the decision to make changes to job descriptions.

A Union withdrew a petition for mediation and fact-finding filed at Massachusetts Department of Labor Relations after parties reached agreement on a successor Collective Bargaining Agreement. Received an MCAD dismissal due to complainant withdrawing charge.

LITIGATION/CLAIMS

New Lawsuits/Claims: There are no new Lawsuits to report for the First Quarter FY 2023.

Significant Developments:

Conservation Law Foundation (CLF) v. MWRA, D. Mass., Case No. 1:22-cv-10626-AK: On September 23, 2022, MWRA filed a motion to dismiss CLF's complaint.

Closed Cases:

GEICO v. MWRA, Suffolk Superior Court C.A. No. 2184CV02107: A subrogation action arising out of a motor vehicle accident between the plaintiff's insured and an MWRA driver/vehicle was resolved by way of settlement. A Stipulation of Dismissal was filed with the court in August.

MWRA v. Saba Development LLC, et al, Suffolk Superior Court C.A. No. 2283CV00968: MWRA filed a complaint for declaratory judgment and injunctive relief against the defendants to stop unpermitted construction activities on a portion of the Sudbury Aqueduct abutting their residential property. A Notice of Voluntary Dismissal was filed with the court on August 26, 2022 after defendants' subsequent remediation of the site.

Closed Claims:

There are no closed claims to report.

Subpoenas:

During First Quarter FY 2023, no subpoenas were received and one subpoena was closed.

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	0	0
Tort/Labor/Employment	1	3	4
Environmental/Regulatory/Other	4	4	3
Eminent Domain/Real Estate	0	0	0
Total	5	7	7
Other Litigation matters (restraining orders, etc.)	0	2	2
Total – all pending lawsuits	5	9	9
Claims not in suit:	0	0	0
Bankruptcy	2	2	1

Wage Garnishment	2	2	2
TRAC/Adjudicatory Appeals	0	0	0
Subpoenas	0	0	0
TOTAL – ALL LITIGATION MATTERS	9	13	13

TRAC/MISC.

New Appeals: There were no new appeals in the 1st Quarter FY 2023.

Settlement by Agreement of Parties There were no Settlements by Agreement of Parties in the 1st Quarter FY 2023.

Stipulation of Dismissal No Stipulations of Dismissal were filed in 1st Quarter FY 2023.

Notice of Dismissal Fine paid in full No Notices of Dismissal for Fines Paid in Full were filed in the 1st Quarter FY 2023.

Tentative Decision No Tentative Decisions were issued in the 1st Quarter FY 2023.

Final Decisions No Final Decisions were issued in the 1st Quarter FY 2023.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
1st Quarter - FY23

Highlights

During the 1st quarter FY23, Internal Audit (IA) commenced a fleet physical inventory of all plated vehicles and equipment in coordination with management. An updated Mandatory Confined Space Entry Training report aligned with the recently implemented Learning Management System is nearing completion. An internal review of water and wastewater license and certifications and an internal review of MIS assets are progressing.

Internal Audit completed 2 incurred cost audits (JCK Underground and Corrosion Probe Inc.). Internal Audit completed 4 labor burden reviews. IA also issued 10 indirect cost rate letters to consultants following a review of their consultant disclosure statements.

Management advisory services included support on the MWRA's leases. Internal Audit also participated in the managed cyber security services selection process.

Internal Audit also supported the issuance of 4 new policies while a few more are in process.

Status of Recommendations

During FY23, 1 recommendation was 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
Fleet Services Non-Plated Equipment Inspections (3/30/20)	0	15	15
Total Recommendations	0	15	15

Note: The Compliance Status of Employees' Mandatory Confined Space Entry Training report issued on 6/30/21 has been retracted. An amended report will be issued in the 2nd quarter FY23.

Cost Savings

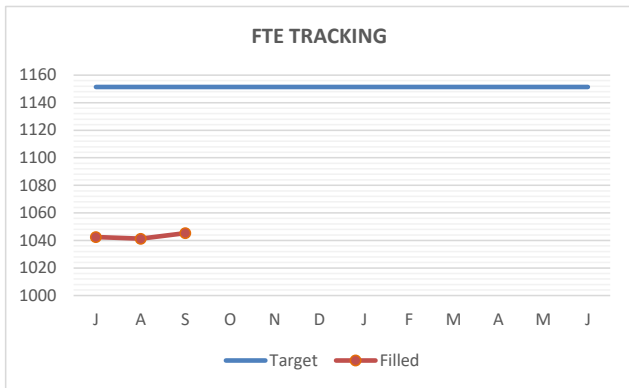
IA's target is to achieve at least \$1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

Cost Savings	FY19	FY20	FY21	FY22	FY23 Q1	TOTALS
Consultants	\$262,384	\$643,845	\$563,525	\$39,938	\$103,088	\$1,612,780
Contractors & Vendors	\$3,152,884	\$2,097,729	\$1,547,223	\$1,714,614	\$733,130	\$9,245,580
Internal Audits	\$210,063	\$212,517	\$214,458	\$222,554	\$54,287	\$913,879
Total	\$3,625,331	\$2,954,091	\$2,325,206	\$1,977,106	\$890,505	\$11,772,240

OTHER MANAGEMENT

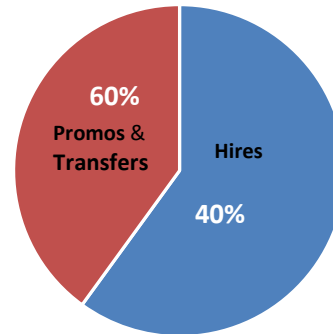
Workforce Management

1st Quarter - FY23

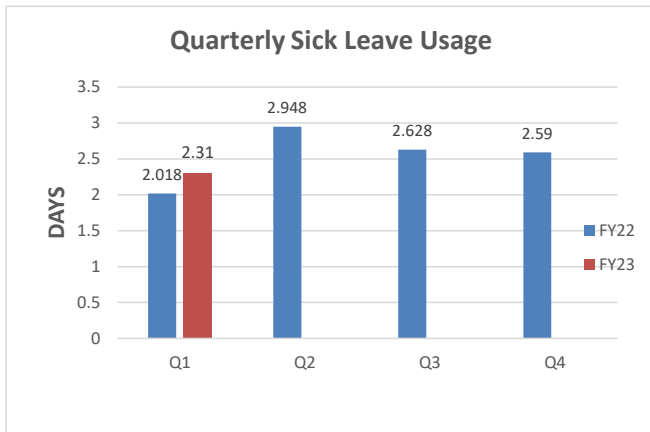


FY23 Target for FTE's = 1151.4
 FTE's as of September 2022= 1045.3
 Tunnel Redundancy as of Sept 2022 = 10

Position Filled by Hires/Promos & Transfer for YTD



	Pr/Trns	Hires	Total
FY21	81 (56%)	64 (44%)	145
FY22	138 (68%)	65 (32%)	203
FY23	42 (60%)	28 (40%)	70



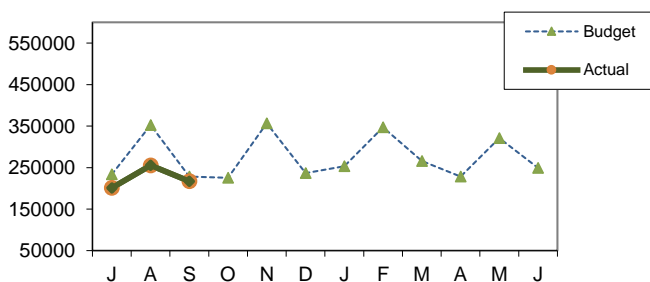
Average quarterly sick leave for the 1st Quarter of FY23 has increased as compared to the 1st Quarter of FY22 (2.31 from 2.018)

Sick Leave and FMLA Usage by Division

	Number of Employees	YTD (usage to date)	Annualized Total	Annual FMLA %	FY22
Admin	131	2.64	10.55	36.4%	7.57
Aff. Action	5	1.85	7.40	0.0%	8.73
Executive	3	0.49	1.96	0.0%	3.11
Finance	46	1.48	5.91	18.2%	6.21
Int. Audit	4	2.16	8.63	0.0%	1.47
Law	12	1.97	7.87	31.1%	12.27
OEP	4	4.82	19.27	33.5%	5.56
Operations	835	2.33	9.33	16.4%	10.87
Tunnel Red	10	1.77	7.07	65.3%	3.94
Pub. Affs.	9	0.58	2.33	8.9%	11.41
MWRA Avg	1059	2.31	9.24	19.6%	10.16

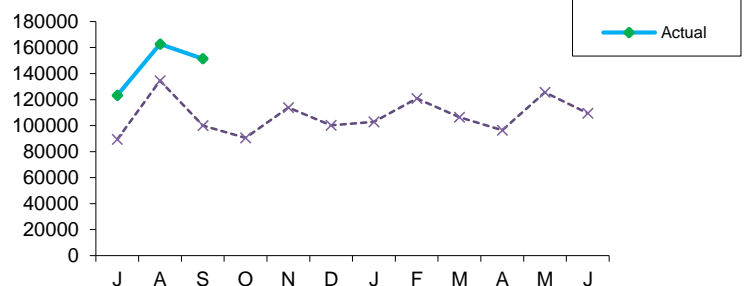
Percent of sick leave usage for FY23, attributable to Family and Medical Leave Act (FMLA) is 19.6%.

Field Operations Current Month Overtime \$



Total Overtime for Field Operations for first quarter was \$657k which is \$166k, or 19.7% under budget. Emergency overtime was \$234k, which was only \$316 under budget. Rain event emergencies were minimal due to drought in early part of 1st quarter (July & August). Coverage overtime was \$256k, which is \$62k, or 32% over budget, due to the shift coverage requirements of numerous vacancies. Planned overtime was \$167k, under budget \$30k, or 15.3%, due to a shortage of available fully complimented work crews.

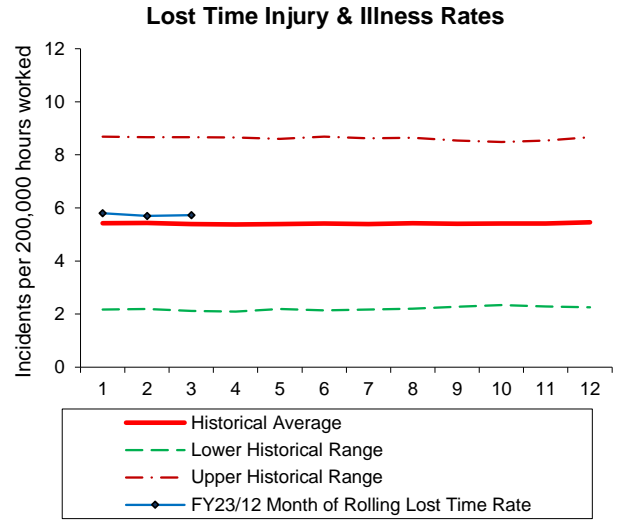
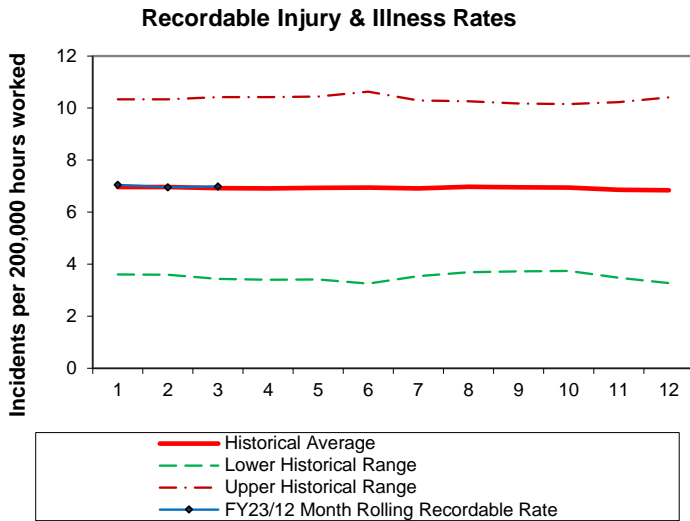
Deer Island Treatment Plant Current Month Overtime \$



Deer Island's total overtime expenditure first quarter was \$437K, which is \$87K or 24.9% over budget due to higher than anticipated shift coverage of \$78K and planned/unplanned overtime of \$24K. This is offset by lower than anticipated storm coverage of (\$15K).

Workplace Safety

1st Quarter - FY23



- "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.
- "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.
- 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.
- 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

	1st Quarter Information		Open Claims
	New	Closed	
Lost Time	9	7	67
Medical Only	14	15	14
Report Only	17	17	
	QYTD		FYTD
Regular Duty Returns	9		9
Light Duty Returns	0		0
Indemnity payments as of September 2022 included in open claims listed			17

COMMENTS:

Regular Duty Returns

July 3 Employees returned to full duty/no restrictions
Aug 3 Employees returned to full duty/no restrictions
Sept 3 Employees returned to full duty/no restrictions

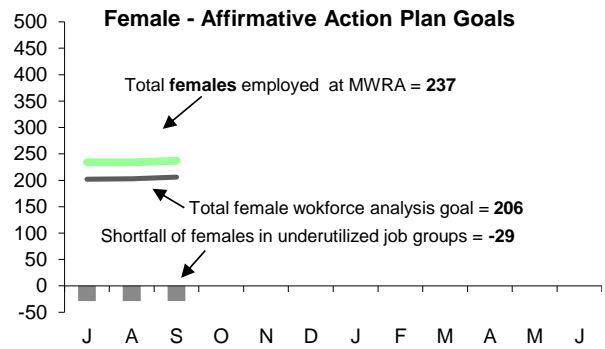
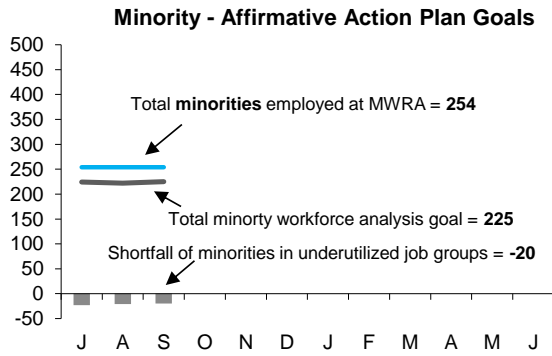
Light Duty Returns

July N/A
Aug N/A
Sept N/A

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 - FY23



Highlights:

At the end of Q1 FY23, 4 job groups or a total of 20 positions are underutilized by minorities as compared to 5 job groups for a total of 21 positions at the end of Q1 FY22; for females 8 job groups or a total of 29 positions are underutilized by females as compared to 5 job groups or a total of 16 positions at the end of Q1 FY22. During Q1, 3 minorities and 8 females were hired. During this same period 6 minorities and 5 females were terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees	Minorities	Achievement	Minority	Females	Achievement	Female
	as of 9/30/2022	as of 9/30/2022	Level	Over or Under Underutilized	As of 9/30/2022	Level	Over or Under Underutilized
Administrator A	26	4	3	1	13	7	6
Administrator B	24	2	5	-3	6	6	0
Clerical A	23	8	3	5	19	17	2
Clerical B	23	7	6	1	3	11	-8
Engineer A	79	20	19	1	20	14	6
Engineer B	61	20	15	5	13	15	-2
Craft A	108	15	20	-5	0	5	-5
Craft B	122	21	23	-2	1	6	-5
Laborer	56	17	13	4	3	2	1
Management A	86	18	17	1	32	24	8
Management B	37	11	7	4	6	9	-3
Operator A	61	4	14	-10	2	4	-2
Operator B	64	19	6	13	3	1	2
Professional A	29	7	7	0	17	11	6
Professional B	148	44	44	0	67	38	29
Para Professional	48	16	10	6	24	25	-1
Technical A	55	18	11	7	6	9	-3
Technical B	8	3	2	1	2	2	0
Total	1058	254	225	49/-20	237	206	60/-29

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/Transfers	AACU Ref. External	Position Status
Administrator B	Deputy Director, DIWWTP	1	Int./Ext.	1	0	PROMO = WM
Clerical B	Warehouse Materials Handler	1	Ext.	0	0	NH = WM
Engineer B	Staff Engineer	1	Ext.	0	0	NH = WM
Engineer B	Project Mnager, Process Control	1	Int.	1	0	TRANS = WM
Engineer B	Project Manager, Proc Eng & Ctrl	1	Int.	1	0	PROMO = WF
Engineer B	Assistant Civil Engineer	1	Int.	1	0	PROMO = WM
Craft A	Sr Med Volt Elect Specialist	1	Int.	0	0	NH = WM
Craft A	Fencing Foreman	1	Int.	1	0	PROMO = WM
Craft A	Unit Supervisor, Machinist	1	Int.	1	0	PROMO = WM
Craft A	Trades Foreman	1	Int.	1	0	PROMO = WM
Craft A	Med Volatage Elect Specialist	1	Int.	1	0	PROMO = WM
Craft B	Facilities Specialist	2	Int./Ext.	1	0	NH=WM PROMO=WM
Craft B	Electrician	1	Ext.	0	0	NH = WM
Craft B	Instrument Technician	2	Int./Ext.	2	0	PROMO = 1HM, 1WM
Operator A	Area Supervisor	2	Int.	2	0	PROMO = 2WM
Operator A	Transmission & Treatment Operator	2	Int./Ext.	2	0	PROMO = 2WM
Para Professional	Records Center Specialist	1	Ext.	0	0	NH = WF
Para Professional	Administrative Systems Coord	1	Ext.	0	1	NH = WF
Technical A	Systems Admin III (Systems)	1	Ext.	0	0	NH = BM
Technical A	Sr. Prog. Manager, Applicaton Group	1	Int./Ext.	1	0	PROMO = WM
Technical A	Communication & Control Tech	1	Int./Ext.	1	0	PROMO = HM
Technical A	Sr. Instrument Technician	2	Int.	2	0	PROMO = 1BM, 1WM

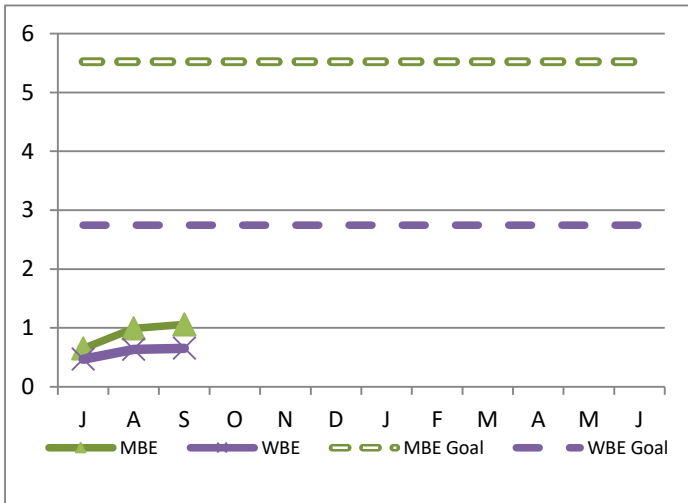
MBE/WBE Expenditures

1st Quarter - FY23

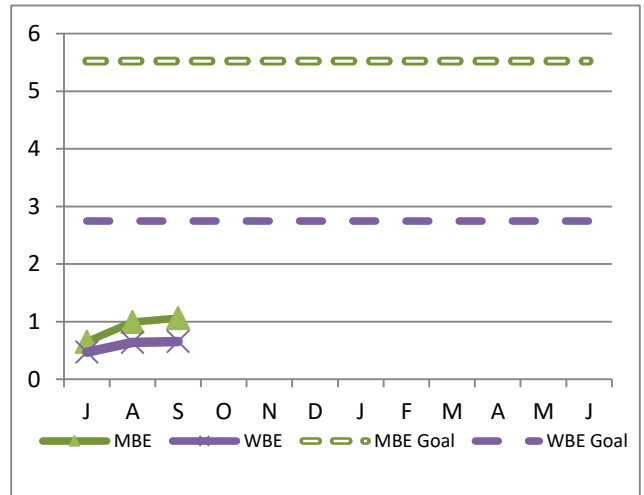
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY23 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they 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.

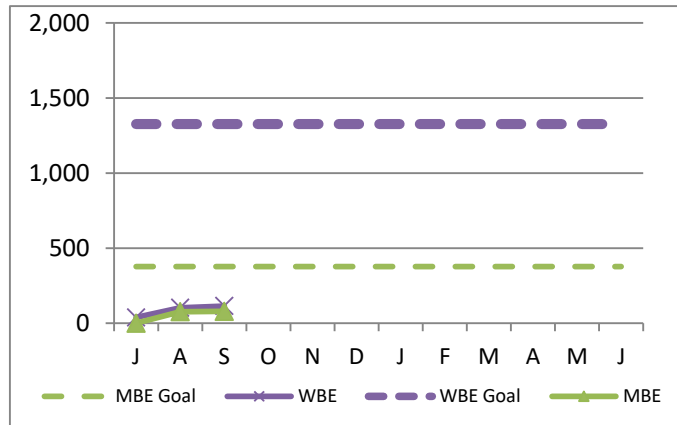
Construction



Professional Services



Goods/Services



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

MBE			
FY23 YTD		FY22	
Amount	Percent	Amount	Percent
124,073	1.5%	3,102,188	56.2%
1,055,496	36.0%	3,156,867	147.1%
14,124	3.4%	387,120	102.7%
1,193,693	10.4%	6,646,175	82.6%

WBE			
FY23 YTD		FY22	
Amount	Percent	Amount	Percent
134,334	3.3%	1,276,049	46.5%
342,431	14.5%	1,737,850	100.8%
62,122	4.8%	365,393	27.6%
538,887	7.0%	3,379,292	58.3%

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 – FY23

As of September 2022, total expenses are \$192.4 million, \$6.7 million or 3.3% lower than budget, and total revenue is \$210.3 million, \$1.1 million or 0.5% over budget, for a net variance of \$7.7 million.

Expenses –

Direct Expenses are \$61.0 million, \$4.9 million or 7.5% under budget.

- **Wages & Salaries** are \$2.9 million under budget or 10.7%. Regular pay is \$3.0 million under budget, due primarily to lower head count, and timing of backfilling positions. YTD through September, the average Full Time Equivalent (FTE) positions was 1,053, one hundred and fourteen fewer than the 1,167 FTE's budgeted.
- **Ongoing Maintenance** is \$2.3 million under budget or 23.5%. The variance reflects the actual timing of projects and in this case the biggest driver of the underspending is the delayed start of the Norumbega Tank cleaning project (\$1.3 million).
- **Other Services** expenses are \$344k under budget or 4.7%, primarily due to by lower Sludge Pelletization expense of \$274k and by telecommunication costs of \$202k, partially offset by higher spending of \$334k on Memberships, Dues, and Subscriptions due to timing.
- **Workers Compensation** expenses are \$238k under budget or 37.8%, primarily due to lower spending for Compensation Payments of \$165k and Medical Payments of \$60k.
- **Fringe Benefits** expenses are \$199k under budget or 3.4%, primarily due to lower health insurance expense, reflecting the lower headcount.
- **Utilities** expenses are \$651k over budget or 10.2%, due to higher electricity spending of \$686k. Higher electricity prices are due to higher real time energy costs. This reflects higher spending for electricity at Deer Island of \$558k due to lower than budgeted on-site generation which resulted in a 4.1% increase in purchased power.
- **Chemicals** are \$308k over budget or 7.3% due to higher spending for Sodium Hypochlorite, \$372k over budget, reflecting higher contract price at Carroll Water Treatment Plant and greater usage at DI due to lower flows and greater need for odor control.
- **Other Materials** expenses are \$178k over budget or 15.9%, as vehicle purchases were \$264k over budget due to timing of those purchases, partially offset by delayed computer software purchases which are \$80k under budget.

Indirect Expenses are \$20.1 million, \$154k or 0.8% under budget due to lower Watershed Reimbursement.

Capital Finance Expenses totaled \$111.2 million, \$1.6 million or 1.4% under budget, reflecting lower than budgeted variable interest expense.

Revenue and Income –

Total Revenue and Income is \$210.3 million, or \$1.0 million over budget. Investment income was the driver at \$1.1 million over budget, reflecting higher than budget interest rates.

	Sep 2022 Year-to-Date			
	Period 3 YTD Budget	Period 3 YTD Actual	Period 3 YTD Variance	%
EXPENSES				
WAGES AND SALARIES	\$ 27,275,738	\$ 24,369,145	\$ (2,906,593)	-10.7%
OVERTIME	1,340,698	1,227,717	(112,981)	-8.4%
FRINGE BENEFITS	5,878,843	5,679,767	(199,076)	-3.4%
WORKERS' COMPENSATION	629,938	392,086	(237,852)	-37.8%
CHEMICALS	4,210,951	4,518,863	307,912	7.3%
ENERGY AND UTILITIES	6,408,929	7,059,772	650,843	10.2%
MAINTENANCE	9,667,385	7,397,249	(2,270,136)	-23.5%
TRAINING AND MEETINGS	118,685	53,970	(64,715)	-54.5%
PROFESSIONAL SERVICES	1,979,888	2,063,894	84,006	4.2%
OTHER MATERIALS	1,123,654	1,302,053	178,399	15.9%
OTHER SERVICES	7,315,384	6,971,362	(344,022)	-4.7%
TOTAL DIRECT EXPENSES	\$ 65,950,093	\$ 61,035,878	\$ (4,914,215)	-7.5%
INSURANCE	\$ 979,001	\$ 993,831	\$ 14,830	1.5%
WATERSHED/PILOT	4,112,924	3,944,177	(168,747)	-4.1%
HEEC PAYMENT	1,583,031	1,583,031	-	0.0%
MITIGATION	433,924	433,924	-	0.0%
ADDITIONS TO RESERVES	604,613	604,613	-	0.0%
RETIREMENT FUND	12,555,203	12,555,203	-	0.0%
POST EMPLOYEE BENEFITS	-	-	-	---
TOTAL INDIRECT EXPENSES	\$ 20,268,696	\$ 20,114,778	\$ (153,917)	-0.8%
STATE REVOLVING FUND	\$ 21,896,288	\$ 21,896,288	\$ -	0.0%
SENIOR DEBT	72,379,983	72,379,983	-	0.0%
DEBT SERVICE ASSISTANCE	(1,182,494)	(1,182,494)	-	0.0%
CURRENT REVENUE/CAPITAL	-	-	-	---
SUBORDINATE MWRA DEBT	18,941,471	18,941,471	-	0.0%
LOCAL WATER PIPELINE CP	-	-	-	---
CAPITAL LEASE	804,265	804,265	-	0.0%
VARIABLE DEBT	-	(1,596,318)	(1,596,318)	---
DEFEASANCE ACCOUNT	-	-	-	---
DEBT PREPAYMENT	-	-	-	---
TOTAL CAPITAL FINANCE EXPENSE	\$ 112,839,514	\$ 111,243,196	\$ (1,596,318)	-1.4%
TOTAL EXPENSES	\$ 199,058,303	\$ 192,393,852	\$ (6,664,450)	-3.3%
REVENUE & INCOME				
RATE REVENUE	\$ 203,662,000	\$ 203,662,000	\$ -	0.0%
OTHER USER CHARGES	2,694,427	2,662,567	(31,860)	-1.2%
OTHER REVENUE	800,490	811,144	10,654	1.3%
RATE STABILIZATION	245,000	245,000	-	0.0%
INVESTMENT INCOME	1,846,458	2,924,676	1,078,218	58.4%
TOTAL REVENUE & INCOME	\$ 209,248,375	\$ 210,305,387	\$ 1,057,012	0.5%

Cost of Debt

1st Quarter – FY23

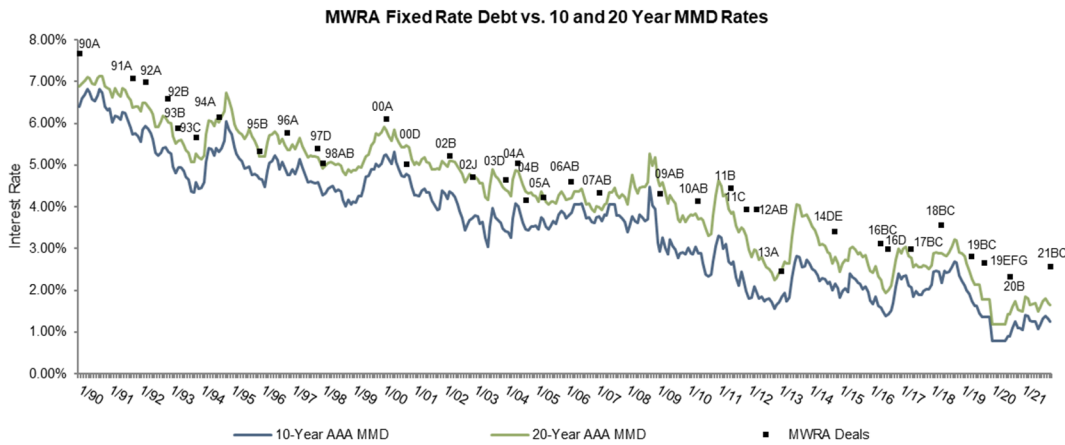
MWRA borrowing costs are a function of the fixed and variable tax exempt interest rate environment, the level of MWRA's variable interest rate exposure and the perceived creditworthiness of MWRA. Each of these factors has contributed to decreased MWRA borrowing costs since 1990.

Average Cost of MWRA Debt FYTD

Fixed Debt (\$3.20 billion)	3.28%
Variable Debt (\$269.01million)	1.84%
SRF Debt (\$758.6 million)	1.67%
Weighted Average Debt Cost (\$4.22 billion)	2.90%

Most Recent Senior Fixed Debt Issue December 2021

2021 Series B and C (\$748.0 million) 2.56%

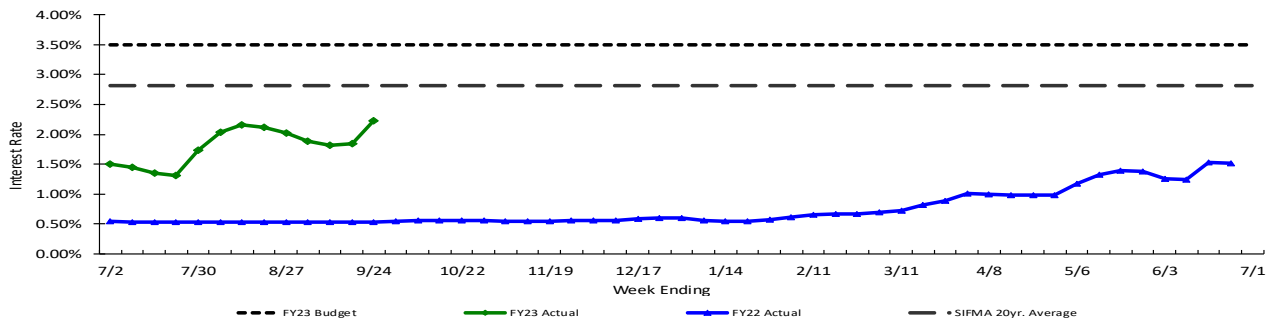


Bond Deal	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A	2004B	2005A	2006AB	2007AB	2009AB
Rate	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%	4.17%	4.22%	4.61%	4.34%	4.32%
Avg Life	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs	13.5 yrs	18.4 yrs	25.9 yrs	24.4 yrs	15.4 yrs

Bond Deal	2010AB	2011B	2011C	2012AB	2013A	2014D-F	2016BC	2016D	2017BC	2018BC	2019BC	2019EFG	2020B	2021BC
Rate	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%	2.56%
Avg Life	16.4 yrs	18.8 yrs	16.5 yrs	17.9 yrs	9.9 yrs	15.1 yrs	17.4 yrs	18.8 yrs	11.2 yrs	11.7 yrs	11.9 yrs	9.73 yrs.	15.6 yrs	12.2 yrs

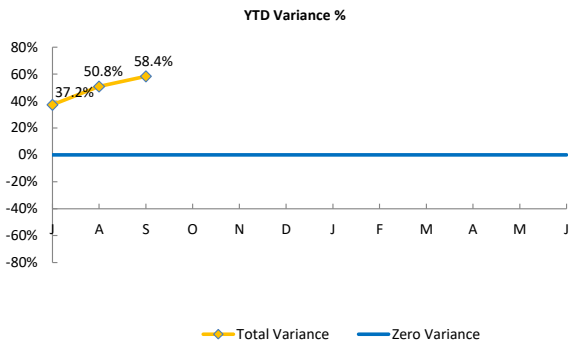
Weekly Average Variable Interest Rates vs. Budget

MWRA currently has eight variable rate debt issues with \$443.9 million outstanding, excluding commercial paper. Of the eight outstanding series, three 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 ranged from a high of 1.96% to a low of 1.3% 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.



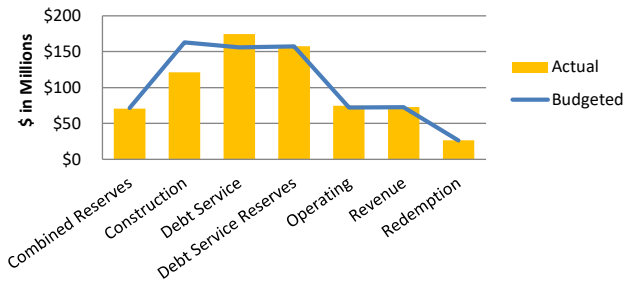
Investment Income 1st Quarter – FY23

Year To Date

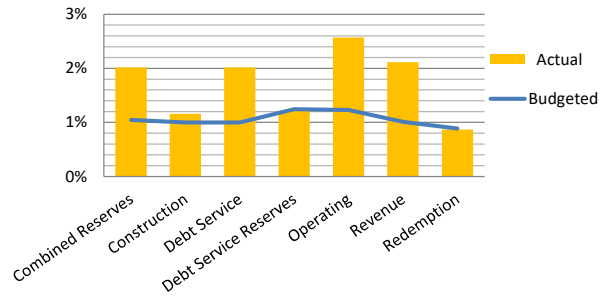


	YTD BUDGET VARIANCE				
	(\$000)				
	BALANCES IMPACT	RATES	IMPACT	TOTAL	%
Combined Reserves	(\$2)		\$101	99	81.7%
Construction	(\$188)		\$181	(6)	24.2%
Debt Service	\$43		\$287	330	101.7%
Debt Service Reserves	\$0		(\$7)	(7)	-2.2%
Operating	\$8		\$108	116	74.7%
Revenue	\$0		\$90	90	74.7%
Redemption	\$0		(\$1)	(1)	-2.0%
Total Variance	(\$139)		\$760	\$621	58.4%

YTD Average Balances Budgeted vs. Actual

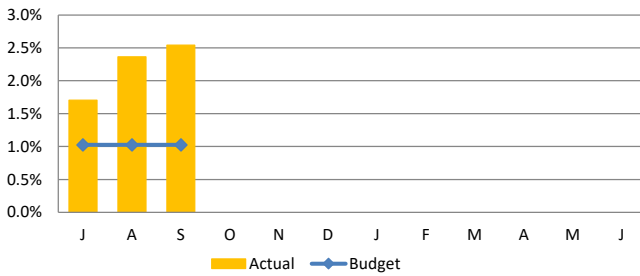


YTD Average Interest Rate Budgeted vs. Actual

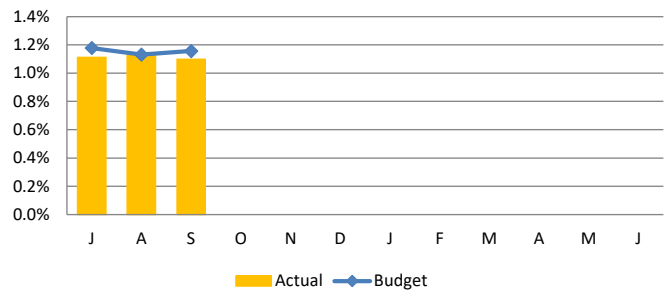


Monthly

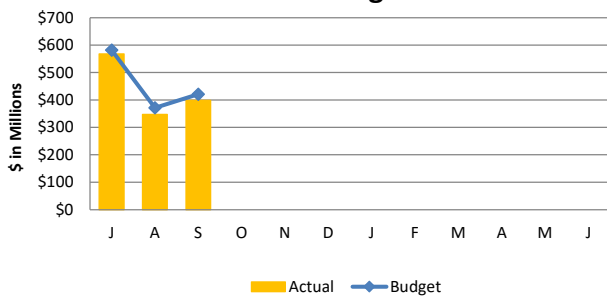
Short -Term Interest Rates



Long -Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances

