MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

Fourth Quarter FY2023

Q1	Q2	Q3	Q4

Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
September 13, 2023

Board of Directors Report on Key Indicators of MWRA Performance
Fourth 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.

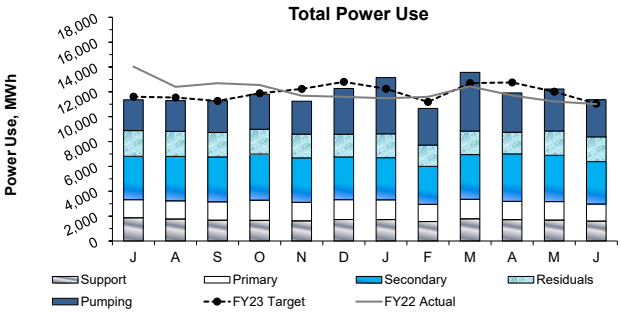
Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer

September 13, 2023

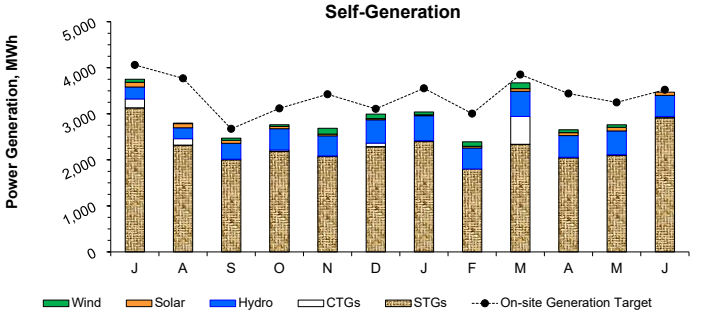
OPERATIONS AND MAINTENANCE

Deer Island Operations

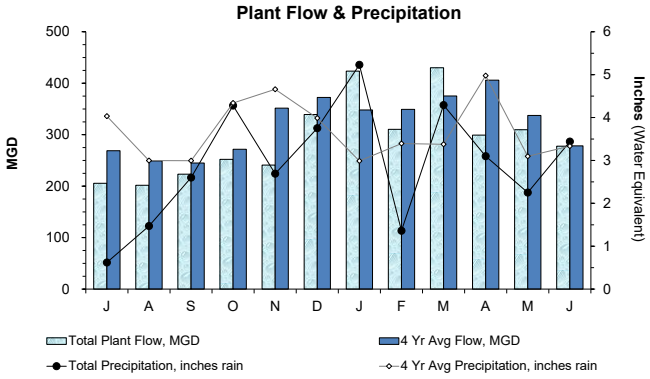
4th Quarter - FY23



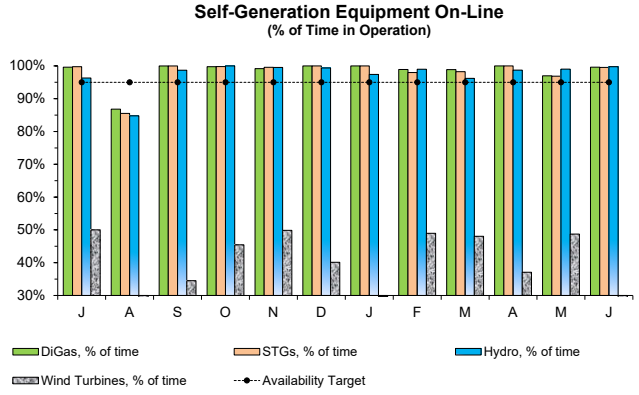
Total power usage in the 4th Quarter was on target (-0.8%) even though plant flow for this period was 13.2% below target with historical (4 year average) data used to generate the electricity model, as precipitation was 22.9% below target (11.41 inches expected vs. 8.79 inches actual). Power usage for most of the treatment processes was lower to or similar to target, including power used for raw wastewater pumping which was 9.8% below target as expected due to the lower plant flow. Power usage for secondary treatment cryogenic oxygen generation and for the residuals treatment processes was 18.7% and 6.1% higher than target, respectively, due to higher oxygen demand and higher secondary waste sludge production. **Overall, total power usage for FY23 was within 0.8% of target as total plant flow was 8.8% below the 4 year average plant flow target.**



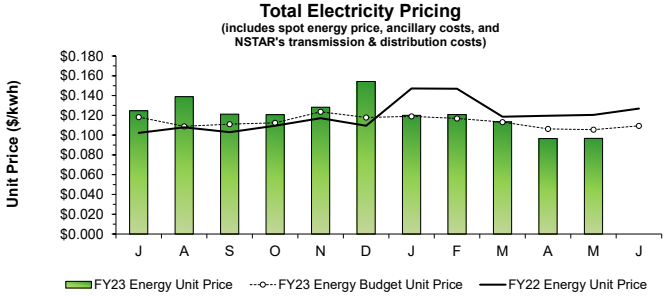
Power generated on-site during the 4th Quarter was 13.0% below the target. The CTGs operated on June 5 for an ISO-NE demand response summer audit and briefly throughout the quarter for maintenance/checkout purposes. STGs generation was 4.1% below target as digester gas production was 5.2% below target. Hydro Turbine generation was 7.7% below target due to lower plant flows. Solar Panel generation was 21.5% below target as the Residuals Odor Control Facility rooftop array continues to remain out of service pending replacement of the grid inverter which has been difficult to source. Wind Turbine generation was 73.9% below target as Turbine #1 remained out of service and Turbine #2 has been out of service since May 29. This turbine was taken out of service for precautionary reasons during the wind storm that led to catastrophic damage to the offline Turbine #1, and an inspection of Turbine #2 noted the inboard bearing on the generator shaft was in need of replacement. Repairs for Turbine #2 will proceed pending arrival of the replacement parts. **Overall, power generation was 13.1% below target for FY23.**



Total Plant Flow for the 4th Quarter was 13.2% below target with the budgeted 4 year average plant flow (295.5 MGD actual vs 340.5 MGD expected) as precipitation was 22.9% below target (8.79 inches actual vs. 11.41 inches expected). **Total Plant Flow for FY23 was 8.8% below target as precipitation was 20.6% below target.**

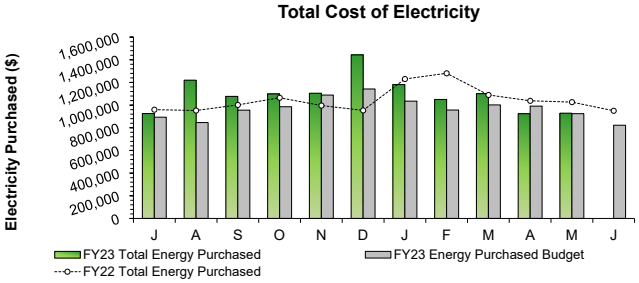


The DiGas System, STGs, and Hydro Turbines availability exceeded the 95% availability target in the 4th Quarter. However, Wind Turbines availability fell to 28.6% due to several mechanical issues with Wind Turbine #2, which reduced its availability to 57.2% for the quarter, and Turbine #1 has been out of service since April 11, 2022. **Overall for FY23, Wind Turbines availability was only 36.9%, while availability for the other self-generating equipment exceeded the 95% availability target.**



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Prices for June is not yet available as the complete invoice has not been received. The actual Total Energy Unit Price in April was 9.2% below target and in May, the most current available price, was 8.3% below target with the budgetary estimates. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges. **Overall for FY23 through May, the Total Energy Unit Price was 6.3% higher than target due to much higher than expected prices during the first half of FY23.**

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

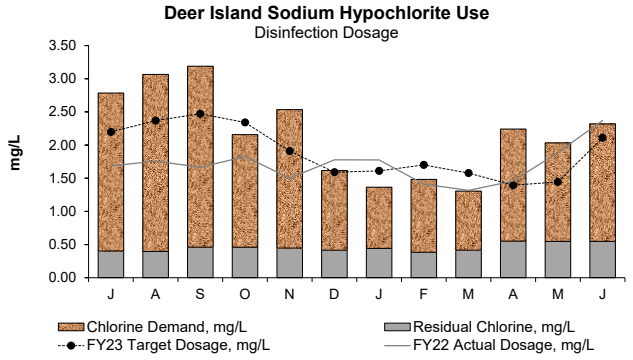


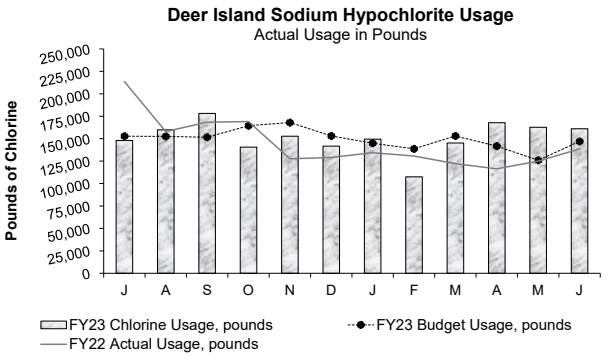
The Electricity cost data for Electricity Purchased in June is not yet available as the complete invoice has not been received. Year-to-date Total Cost of Electricity is $1,231,976 (11.4%) higher than budgeted through May, the most current available price, as the Total Energy Unit Price was 6.3% higher than target and the Total Electricity Purchased was 4.8% above target.

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

Deer Island Operations

4th Quarter - FY23





The disinfection dosing rate in the 4th Quarter was 33.0% above target with budgetary estimates. As a result, actual sodium hypochlorite usage in pounds of chlorine was similarly 18.6% higher-than-expected. The disinfection basin effluent total residual chlorine target was increased on March 29 from a lower target to a higher target that is greater than or equal to 0.50 mg/L, thus resulting in the higher sodium hypochlorite usage. The higher chlorine residual target was adopted in preparation for meeting the more stringent potential new NPDES permit effluent discharge limits for indicator bacteria. DITP maintained an average disinfection chlorine residual of 0.55 mg/L this quarter with an average dosing rate of 2.20 mg/L as chlorine demand was 1.65 mg/L with the higher target. **Overall in FY23, the disinfection dosing rate was 15% higher than the budgetary estimate which was based on meeting only the fecal coliform limits in the current NPDES permit.**

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
July	0	0	0	100.0%	0.00
August	0	0	0	100.0%	0.00
September	0	0	0	100.0%	0.00
October	1	1	0	99.8%	2.43
November	1	1	0	99.9%	2.12
December	4	4	0	99.5%	17.95
January	3	3	0	98.7%	28.99
February	0	0	0	100.0%	0.00
March	2	2	0	96.8%	48.02
April	1	1	0	99.8%	3.56
May	1	1	0	99.6%	4.43
June	0	0	0	100.0%	0.00
Total	13	13	0	99.3%	108.50

99.8% of all flows were treated at full secondary during the 4th Quarter. There were two (2) secondary blending events due to high plant flows from heavy precipitation. These blending events resulted in 7.99 hours of blending and a total of 54.95 MGal of primary-only treated effluent blended with secondary effluent. The Maximum Secondary Capacity during the entire quarter was 700 MGD.

Overall in FY23, 99.3% of all flows received full secondary treatment, as there were 13 separate secondary blending events totaling 108.50 hours of blending and a total of 1,329.77 MGal of primary-only treated effluent blended with secondary effluent. These secondary blending events were due to high plant flows resulting from heavy precipitation, sometimes in combination with snow melt.

Secondary permit limits were met at all times through the entire FY23.

Deer Island Operations & Maintenance Report

Environmental/Pumping:
The plant achieved an instantaneous peak flow rate of 1,013.4 MGD during the early morning hours of May 21. This peak flow occurred during a storm event that brought 1.94 inches of precipitation to the metropolitan Boston area over the course of two (2) days. The Total Plant Flow in the 4th Quarter was 13.2% below the 4 year average plant flow target for the quarter.

Staff from several departments across the MWRA (PICS, I&C, and SCADA) along with Operations staff completed the final switchover of the headworks communications between Columbus Park and DITP from an old copper line system to a new Verizon digital lease line system. This switchover to a new digital lease line system was necessary as Verizon was no longer supporting the copper line system. This project was designated as priority and staff worked diligently to install this new system and conducted trial tests prior to performing the final successful cutover to the new system on May 4.

Secondary:
Annual turnaround maintenance was performed on Train #2 in the Cryogenic Oxygen Facility from May 15 to May 26. 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 #2 as well as, a number of other components of the oxygen plant. The same turnaround maintenance will be completed on Train #1 in the fall.

Disinfection:
The disinfection basin effluent total residual chlorine target was raised to greater than or equal to 0.50 mg/L starting on March 29. The higher chlorine residual target was adopted in preparation for meeting the more stringent potential new NPDES permit effluent discharge limits for indicator bacteria including lower fecal coliform limits and new limits for Enterococcus bacteria.

Deer Island Operations & Maintenance Report (continued)

Residuals:
Sludge feed to each of the Module #2 digesters (#1 through #4) was temporarily suspended, one at a time, for several days each, starting on May 15, to allow the contractor to perform routine scheduled maintenance on each of the digester's sludge overflow line. This maintenance is performed on only one (1) digester at a time and continued until this maintenance is completed for these four (4) operating digesters. This maintenance was not needed for the Module #3 digesters as these digesters were only recently placed into operation earlier this year. This routine preventative maintenance is typically performed annually.

Odor Control Treatment:
Carbon adsorber (CAD) units #1 and #2 in the East Odor Control (EOC) Facility and unit #5 in the Residuals Odor Control (OC) Facility were emptied and refilled with new regenerated activated carbon media this quarter as part of routine maintenance to replace spent activated carbon.

Energy and Thermal Power Plant:
Overall, total power generated on-site accounted for 25.0% of Deer Island's total power use for the 4th Quarter and was 24.9% for FY23. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) was 24.1% for FY23.

CTG-1A was operated for approximately 1.8 hours on June 5 for an ISO-New England declared Demand Response summer audit event. The performance on this audit determines DITP's demand response program payment for the next six (6) months.

Routine annual maintenance was performed for CTG 1A during the week of June 12. The scope of the work included routine preventative maintenance, instrument calibrations, and inspection of its generator bearing. CTG 1A was not available for operation during this maintenance. However, CTG 2B was available for operation in the event of an emergency and a single generator is able to provide sufficient power to the plant up to plant flows of 825 MGD. CTG 1A was successfully test operated at the end of the maintenance on Friday June 16 and the unit was returned to standby mode. Additionally, a required fire system inspection for CTG 1A was successfully completed on June 23. These inspections routinely take approximately four (4) hours to complete and the unit was returned to standby once the inspection was completed.

One half of the solar array on the rooftop of the Maintenance/Warehouse Building, MW #2, was returned to service on April 20 after the failed A/C contactor was replaced. This solar array had failed on March 21. The other half of the same solar array system, MW #1, unexpectedly failed on April 21 due to a pair of failed transistors in the grid inverter. The transistors were replaced and the array was returned to service on June 6. The rated capacity of the combined M/W solar array is 180 kW.

Wind Turbine #1 has been out of service since April 11, 2022 with a main shaft bearing failure. During the early morning of May 29, this turbine experienced a catastrophic structural failure when the hydraulic brake system failed, causing parts of two (2) blades to come apart while the unit spun out of control for several hours during a wind storm, until the winds decreased sufficiently enough to bring the blade assembly under control to be secured. For safety reasons, the public access area in the vicinity of the turbines and the South Parking Lot 3 were closed, and the nose cone and blade assembly for this turbine was removed and safely lowered to the ground on June 2. Additionally, Wind Turbine #2 was taken out of operation as a precautionary measure on May 29 and is awaiting replacement of a faulty inboard bearing on the generator shaft before attempting to return the unit to operation.

DITP took delivery of 320,000 gallons of #2 fuel oil, a total of 32 oil tanker trucks, without incident from May 22 through May 30. This fuel oil is used for CTG operation, for boiler startup operations, and for supplemental fuel for boiler operation during periods of low or unstable digester gas production.

Clinton Operations & Maintenance Report

Dewatering Building:
Maintenance and Facility Specialists made repairs on the Belt Filter Press conveyor. Maintenance staff also completed numerous monthly Preventative Maintenance (PM) work orders. Operation staff washed down and dewatered Gravity Thickener #1. They also washed down the weirs on Gravity Thickener # 2. A contractor checked the eyewash stations for connection to the Verbatim alarm system. A contractor also calibrated the Belt Filter Press flow meter.

Chemical Building:
Maintenance staff removed and replaced the #2 Waste Activated Sludge (WAS) pump with a new pump and pipe spool, and returned the unit to operation. Maintenance staff and Facility Specialists disassembled & cleaned the soda ash feed line and mixing tank. They also cleaned and resealed the soda ash inspection hatch. Staff install a new Hypochlorite storage tank with the assistance of a Chelsea crane crew. Staff also flushed the feed pumps and replaced the diaphragms on the #1 & #2 ferric pumps. The electrical contractor determined there was a faulty flow switch for the eyewash showers located in the lower level. Staff worked with contractor to install flow tubes and replaced the # 2 WAS flow meter. The contractor then calibrated the WAS and the Return Activated Sludge (RAS) flow meters.

Aeration Basins:
Operations staff cleaned the pH and dissolved oxygen probes. The contractor calibrated the pH and ORP probes.

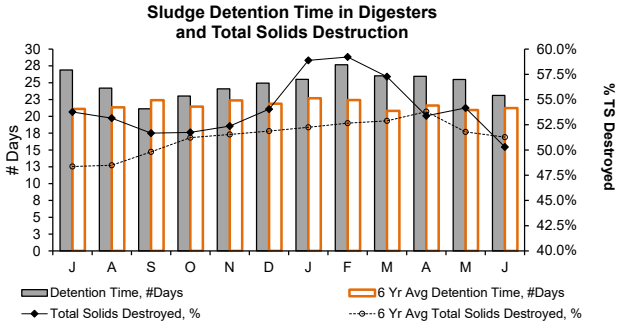
Phosphorus Building:
Maintenance staff acid washed all three (3) disk filters, cleaned the troughs, and inspected all the spray nozzles. Operation staff cleaned both online CL17 chlorine analyzers. Maintenance staff replaced the sump pump for the CL17 chlorine analyzer dosing system. The contractor charged and reinsulated the newly installed line for AC unit.

Headworks Building:
Maintenance staff cleaned the influent and mechanical bar racks and greased the upper and lower pin racks. The contractor tested the newly installed influent gates with water for the one (1) hour leak test. Operations staff drained the water out of the channel for the contractor. They removed the drain plug and the stop logs. The contractor disassembled screw pumps #1 and #3.

Digester Building:
Maintenance staff checked all equipment for proper operation and also greased the Ovivo mixer on the floating cover. Staff performed maintenance on the #2 waste gas flare to establish gas flow, however, the digester gas pipe continues to remain blocked.

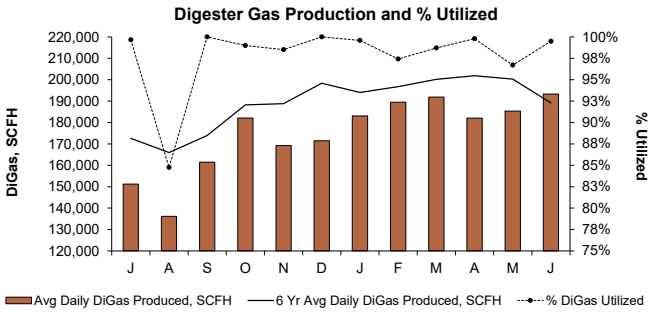
Deer Island Operations and Residuals

4th Quarter - FY23



Total solids (TS) destruction following anaerobic sludge digestion averaged 52.6% during the 4th Quarter, on target (+0.6%) with the 6 year average of 52.3%. Sludge detention time in the digesters was 24.8 days, 16.9% above the 21.3 days detention time target. 7.9 digesters were in operation, just under the projected target of 8.0 digesters. The higher sludge detention time is attributed to a 3.8% lower-than-expected volume of sludge feed going to the digesters. **Overall for FY23, TS destruction averaged 54.2%, 5.5% higher than the 51.3% target.**

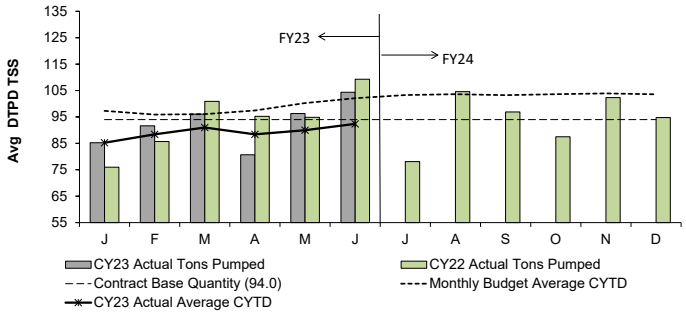
Total solids (TS) destruction is dependent on sludge detention time which is determined by primary and secondary solids production, plant flow, and the number of active digesters in operation. Solids destruction is also significantly impacted by changes in the number of digesters and the resulting shifting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



The Avg Daily DiGas Production in the 4th Quarter was 5.2% below the 6 Year Avg Daily DiGas Production due mainly to 7.3% lower-than-expected primary sludge production as a result of 13.2% lower plant flows. 98.7% of the Digas produced was utilized at the Thermal Power Plant in the 4th Quarter. **Overall for FY23, DiGas Production was 7.6% lower-than-expected and 97.8% of the DiGas produced was utlized at the Thermal Power Plant.**

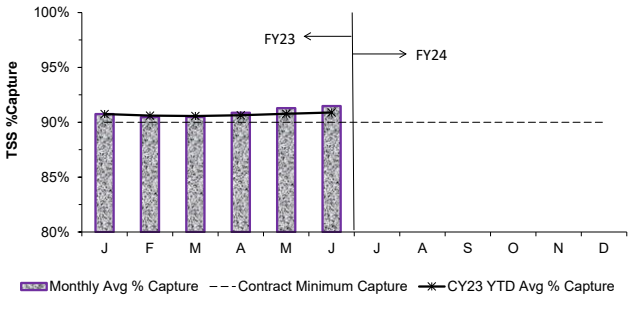
Residuals Pellet Plant

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, 2023). 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 (FY23's budget is 103.3 DTPD/TSS and the preliminary FY24's budget is 103.2 DTPD/TSS).

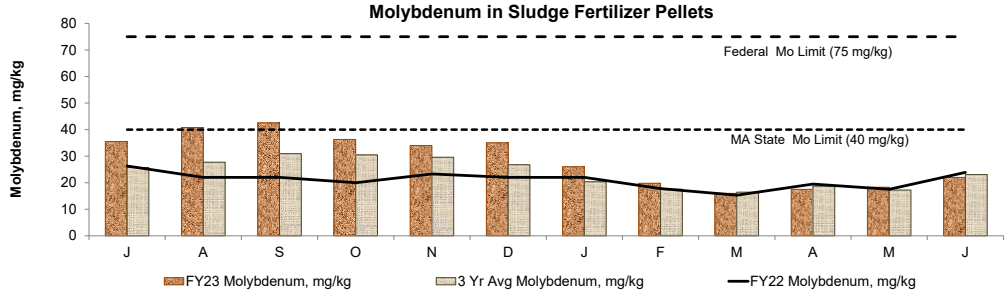


The average quantity of sludge sent to the Biosolids Processing Facility (BPF) in the 4th Quarter was 93.8 TSS Dry Tons Per Day (DTPD), 13.2% below target with the FY23 budget of 108.1 TSS DTPD for the same period. The lower amount of sludge sent to the BPF is partially attributed to a lower-than-expected volume of sludge being pumped to the BPF. Additionally, staff discovered a leaking flushing water valve that had inadvertently diluted the sludge in the DITP Digested Sludge Holding Tanks for several days, thus reducing the solids content of the sludge that was sent to the BPF from April 17 through the first two weeks of May.

The overall CY23-to-date average quantity of sludge pumped is 92.4 DTPD, 9.5% below target compared to the CY23-to-date average budget of 102.1 DTPD.



The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 4th Quarter was 91.21% and the CY23-to-date average capture is 90.9%.



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. The Massachusetts Type I biosolids standard for molybdenum was changed from 25 mg/kg to 40 mg/kg in 2016, allowing 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.

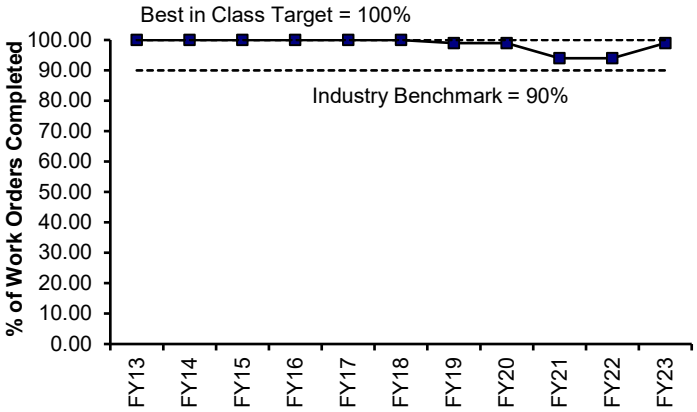
Overall, the levels have been below the DEP Type 1 limit for all three (3) metals. For Mo, the level in the MWRA sludge fertilizer pellets during the 4th Quarter averaged 19.3 mg/kg, 2% below the 3 year average, 52% below target with the MA State Limit, and 74% below the Federal Limit. **Overall for FY23, the Mo level in the pellets averaged 28.6 mg/kg, 28% below the MA State Limit, and 62% below the Federal Limit.**

Deer Island Yearly Maintenance Metrics

4th Quarter - FY23

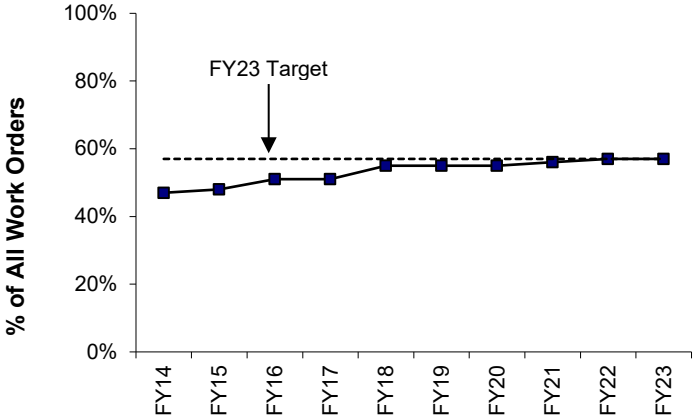
Proactive and Productivity Measures

Preventative Maintenance



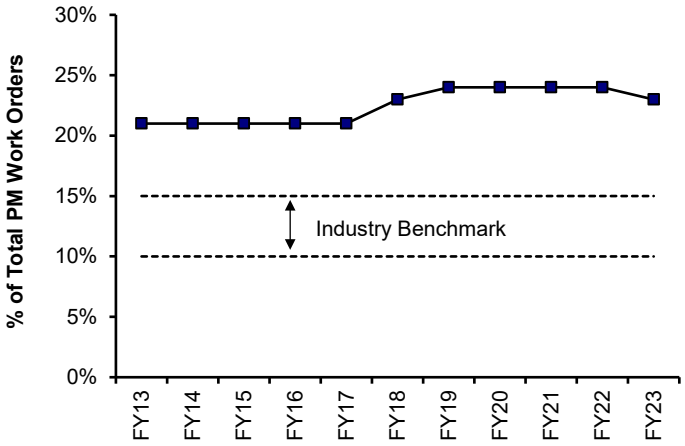
The industry benchmark is 90% for Preventative Maintenance (PM) completion. Upon reaching the 90% goal in FY05, the target goal was increased to the "Best in Class" Target of 100% PM completion. Reliability-Centered Maintenance (RCM) and PM optimization efforts have continued. PM completion rate was 99% in FY23 .

Maintenance Kitting



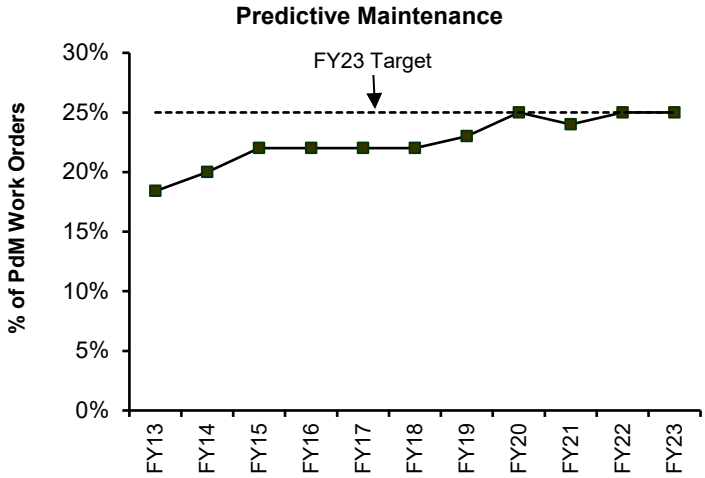
Preventive Maintenance (PM) inventory items were loaded into Maximo to assign spare parts for equipment to PM work orders. DITP reached the PM kitting goal of 100%. In FY12 a new graph was developed to track kitting of all maintenance work orders in an effort to increase wrench time. Staff continues to fine-tune the process to "kit" all maintenance work orders. Kitting is considered a best practice by maintenance and reliability professionals. It entails staging parts necessary to complete maintenance work. Kitting allows maintenance staff to spend more time "turning the wrench" and less time waiting for parts at the stockroom window. Kitting for FY23 was 57%, meeting DITP's goal of 57%.

Operations Light Maintenance PMs



The percentage of preventive maintenance work orders completed by Operations staff (non maintenance staff) increased from less than 1% in January 2002 to the current level of 23% in FY23. DITP reached the industry benchmark range of 15% and has exceeded the goal through FY23. The slight decrease of Operations PM work orders is due to adjusting frequencies during the year to meet plant needs.

Predictive Maintenance

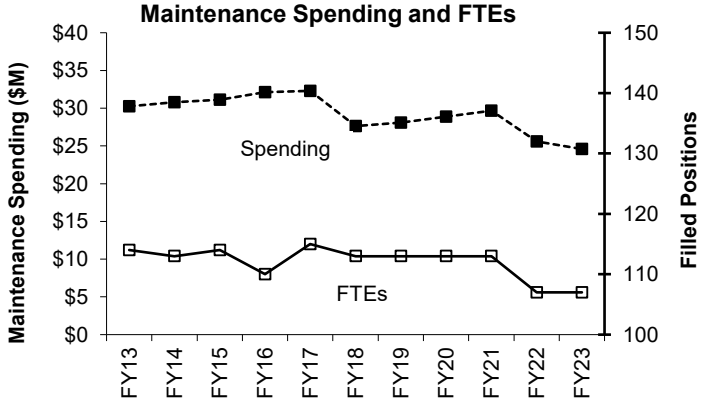


Predictive maintenance has steadily increased from 2% in FY03 to 25% in FY23, DITP met the FY25 goal of 25%. This percentage in predictive maintenance was achieved through the expanded use of lubrication, vibration, thermography, and acoustic ultrasonic testing techniques. The Condition Monitoring Group continually reviews and investigates new opportunities and initiatives to expand condition monitoring testing and analysis.

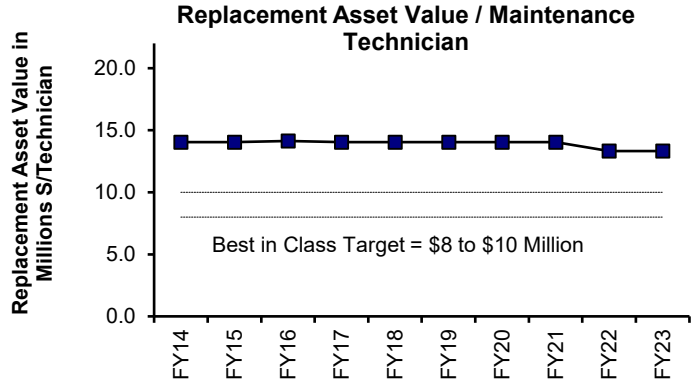
Deer Island Yearly Maintenance Metrics

4th Quarter - FY23

Overall Maintenance Program Measures

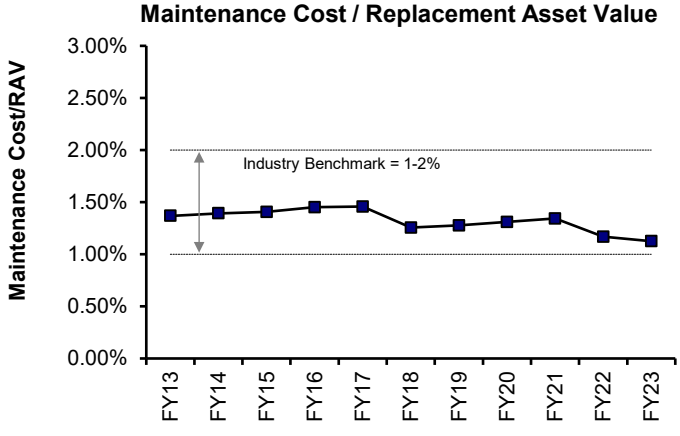


DITP's Maintenance staff is currently at 107 FTE's. Maintenance staff levels ended at 107 due to retirements and hiring challenges for trades personnel. Maintenance has worked to meet our goals though implementation of numerous maintenance efficiencies including: Operations performing light maintenance, cross-functional training and flexibility, and Reliability-Centered Maintenance. This year's overall Maintenance spending decreased slightly.

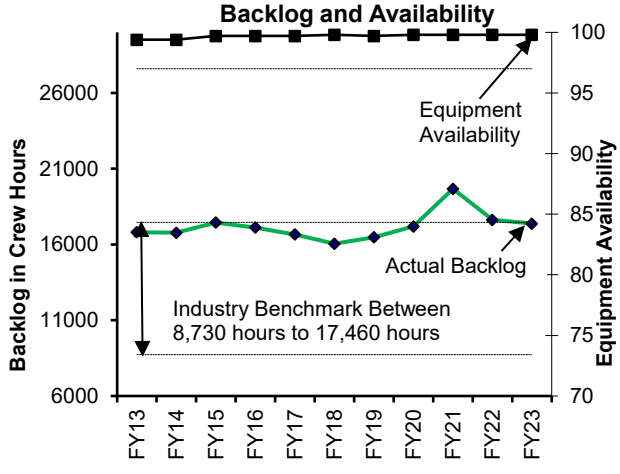


DITP adopted a "best in class" target of $8-$10 Million/Technician for maintenance staffing. DITP remains above this Best in Class. However, as the plant ages and additional equipment replacements are expected, DITP management will reassess staffing as needed.

The Maintenance Spending graph shows actual annual maintenance spending and CIP asset replacements (equipment costs only). Maintenance staff continues to evaluate plant assets and requirements for replacement of obsolete equipment to ensure the plant operates at maximum efficiency. In FY23, overall spending decreased slightly from FY22 due to a reduction in CIP Spending. Maintenance Projects in FY23; Replacement of Odor Control Dampers, Station Batteries replaced in Main Switchgear Building, Radio system upgrade, Replacement of four large valves on the hot water system, Installation of Gas Protection System panel in North Main Pump Station, Installation of LED Emergency Lights, and installation of LED lights for the Digester Complex.



The industry benchmark for annual maintenance spending is between 1% to 2% of replacement asset value, currently DITP is at 1.13%. The plant's replacement asset value is calculated at approximately $2.6 billion dollars. DITP's current maintenance spending is within the industry benchmark. Overall maintenance spending has decreased slightly from last year. DITP Maintenance CEB spending is $23.5 million. CIP spending was $1.1 million (equipment costs only). CIP/CEB Spending totaled $24.6 million in FY23.



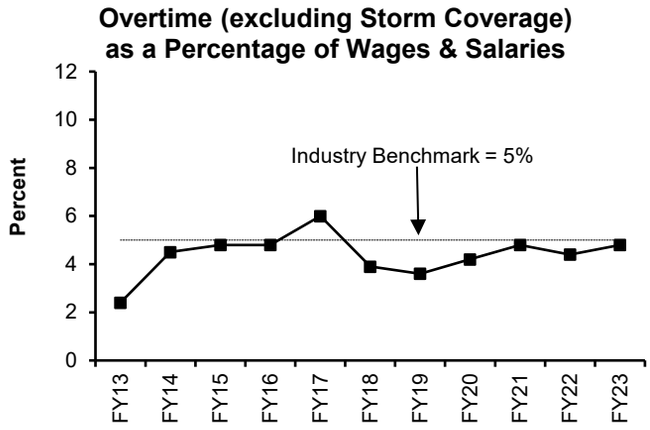
Industry benchmark for Equipment Availability is 97%. Deer Island has exceeded this benchmark over for the last ten years. In FY23 the availability was 99%. The high percentage in Equipment Availability during FY23 is due to redundancy of equipment and effective/efficient maintenance practices.

Industry Benchmark for Backlog is between 8,730 to 17,460 hours for maintenance based on current staffing, the total average backlog for FY23 was 17,373 hours, which is within the industry benchmark. DITP Maintenance has made significant progress over the last year to be within the Industry Benchmark, after being over the previous two years.

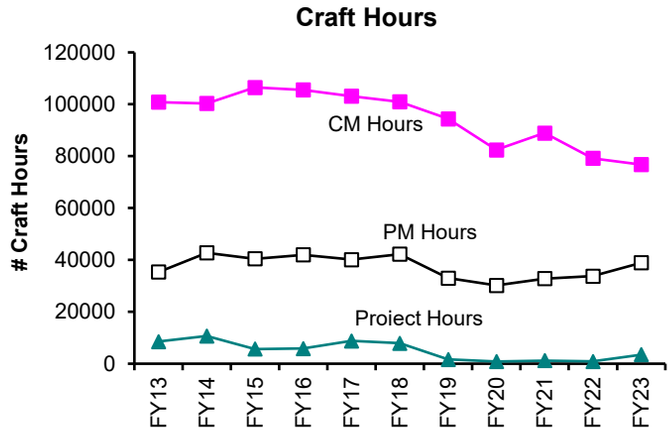
Deer Island Yearly Maintenance Metrics

4th Quarter - FY23

Overall Maintenance Program Measures (cont.)



Management continues its effort to keep overtime below the industry benchmark. DITP maintenance overtime was 4.8% for FY23. Management has taken steps to reduce overtime spending by limiting overtime to repair critical equipment and systems only. DITP has been under the Industry Benchmark every year except FY17, due to the increase in overtime for the Eversource Cable Outage.

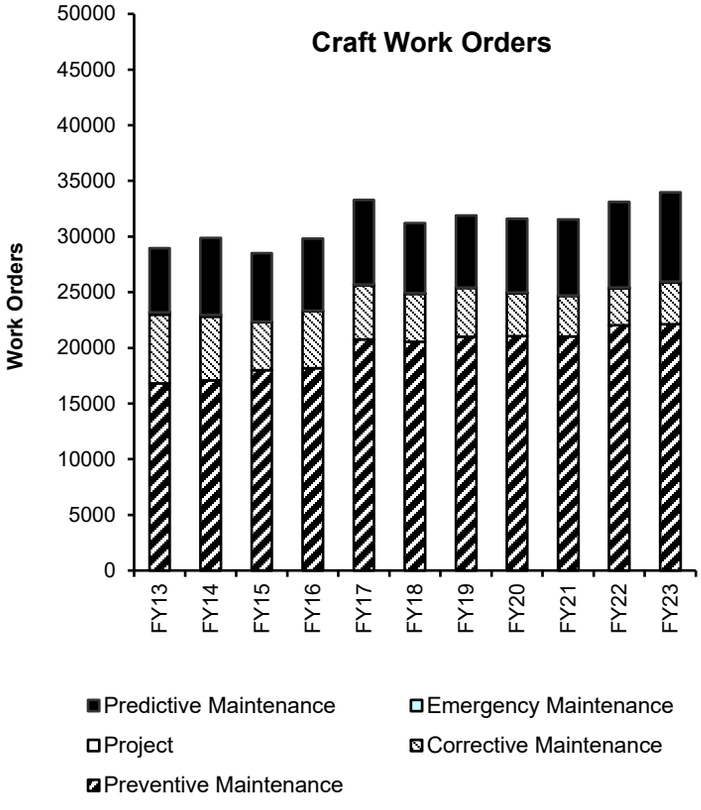


This year's slight decrease in Corrective Maintenance (CM) hours was due to staff working on projects which slipped during Covid to increase equipment performance and extend the useful life of the equipment.

This year's slight increase in Preventive Maintenance (PM) was due to completing additional PM work orders than previous year. Staff continued to work on optimization of the Preventive Maintenance (PM) program

This year slight increase in Project Work (PROJ) was due to catching up on critical project to enhance operations ability to operate the plant and increase equipment performance.

Maintenance did complete some significant maintenance work in FY23: Plumbers installed 400' of stainless steel pipe and replaced sixteen service valves which were corroding. This system allows service water to flush out grit classifier. This extend the life of the service system and increase performance of grit classifiers. Electricians supported the replacing one existing elevator controller in the Maintenance building. We replaced the existing controller with a new Galaxy controller. The Galaxy controller is a variable-frequency closed loop controller and code compliant features is a state of the art system. The existing controller was obsolete. HVAC staff replaced four large valves on the hot water loop. Mechanical staff changed out numerous in-line grinders due to the additional clogging due to wipes in the system.

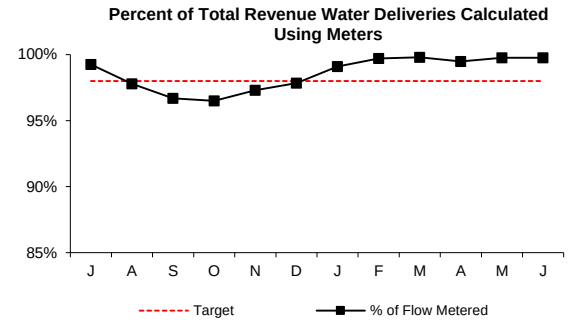


During FY23, the overall number of work orders slightly increased from the previous year. The increase is due to equipment replacements, with increased preventative schedules.
The Work Coordination department is continuously modifying PM, PdM, and CM Job Plans to ensure maintenance is being performed efficiently and effectively, while ensuring reliability and availability of DITP's Assets.

Operations Division Metering & Reliability

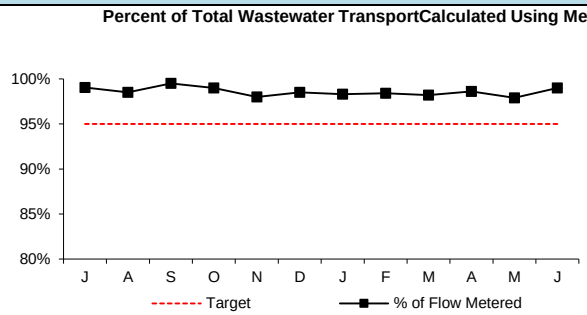
4th Quarter - FY23

WATER METERS



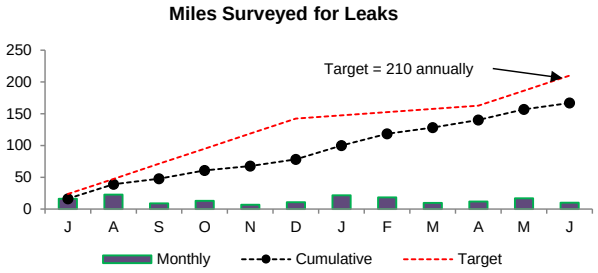
The target for revenue water deliveries calculated using meters is 98%. Estimates are generated for meters that are out of service. During Q4 FY23, 0.3% of the billed water flow was estimated. 99.7% was based on meter actuals. A total of 3.3% of the total flow was measured using annubar or inserted pitot rod meters. Approximately two thirds of this portion of the overall flow can be attributed to meter 181, which is using a previously unmetered connection to service increased demand for

WASTEWATER METERS



The Wastewater Meter Replacement Project is complete. The new meters were installed during the period from April 2021 through December 2021. As of calendar year 2022 rates are being calculated using the new meters. The target for revenue collection meters is a 95% data capture rate. During Q4 FY23, 98.5% billed data was metered with only 1.5% estimated. This metric for each month since the new wastewater meters have been online has been above the 95% target with the lowest month at 97.9%.

WATER DISTRIBUTION SYSTEM PIPELINES



During Quarter 4 of FY23, 38.72 miles of water mains were inspected. The total inspected for the fiscal year to date is 166.86.

Leak Backlog Summary													
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Totals
Leaks Detected	2	1	1	1	3	2	1	0	0	0	0	0	11
Leaks Repaired	2	1	1	1	3	0	2	0	0	0	0	0	10
Backlog	4	4	4	4	4	6	5	5	5	5	5	5	n/a

During Quarter 4 of FY23 no leaks were detected, and none were repaired. Refer to FY23 Leak Report below for details. Also, community service ranging from individual leak location to surveys were conducted for BWSC, Revere, Medford, Saugus and Wakefield.

Quarter 4 - FY23

Date Detected	Location of Leaks	Repaired
07/06/22	Felton St @ Water St., Waltham	07/15/22
07/18/22	Felton St @ Water St., Waltham	07/25/22
08/06/22	Duxbury Rd., @ RTE 128 Wellesley	08/06/22
09/22/22	Winthrop Ave. @ Upland Rd., Revere	09/22/22
10/03/22	Riverside Ave. @ Hall St., Medford	10/05/22
11/02/22	Linden St, @ Waverly Oaks Rd, Waltham	11/03/22
11/04/22	42 Waverly Oaks Rd., Waltham	11/07/22
11/07/22	46 Waverly Oaks Rd., Waltham	11/08/22
12/21/22	610 Lincoln Ave., Saugus	01/11/23
01/03/23	Revere Beach Pkwy. @ Pratt Place	01/19/23

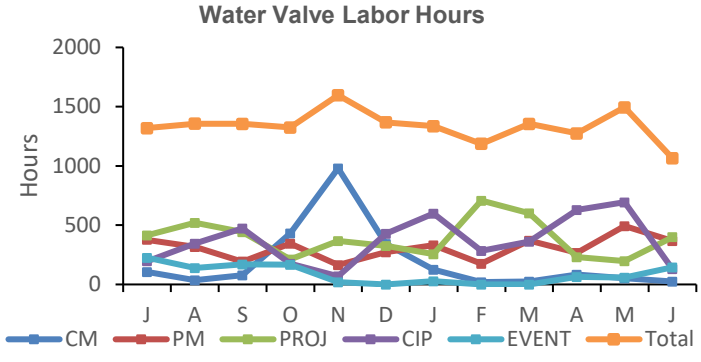
Date Detected	Location of Leaks/Unrepaired
12/04/16	710 Ashland St/Summer St. Lynn, Sect 91. Not surfacing. Leaking emergency connection valve btw MWRA & LWSC systems. LWSC has difficulty isolating 16" main.
08/27/20	**Hyde Park Ave. @ River St. Hyde Park. BWSC is in process of isolating their water main first.
01/14/22	#2 Woodland Rd., Gillis P.S. - Stoneham
06/09/22	West St. @ Pierce St., Hyde Park. Leak repair to be coordinated with Milton. Mobile Pumping Unit will need to be utilized.
12/08/22	Canal St @ Medford St., Malden
	** See above for: Hyde Park Ave. = MWRA is currently evaluating the abandonment of this pipeline based on hydraulic needs.

Water Distribution System Valves

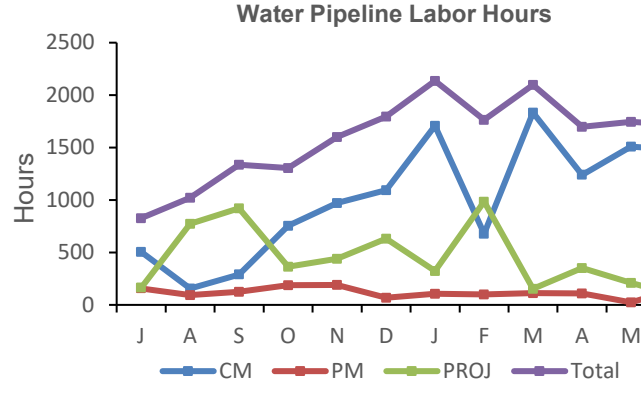
4th Quarter - FY23

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.

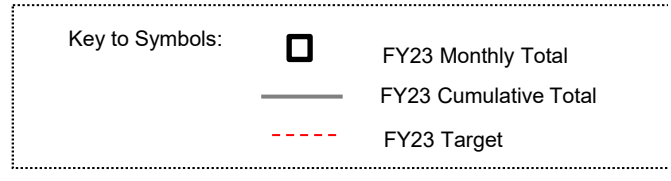


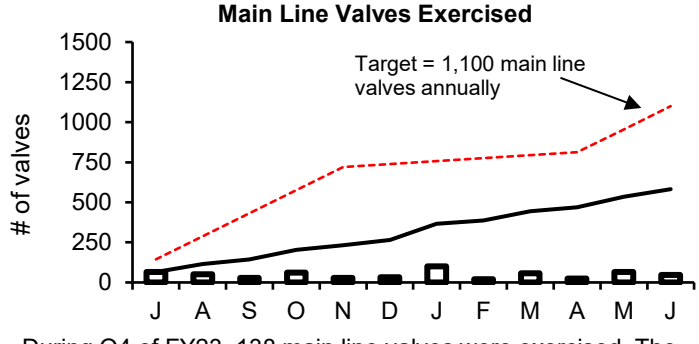
During Q4 of FY23 there was a total of 3836 hours worked. Percentage breakdown; Corrective Maintenance 4%, Preventative Maintenance 29%, Project 22%, Capital Improvement Project 38%, Event - Wtr Fountain 7%



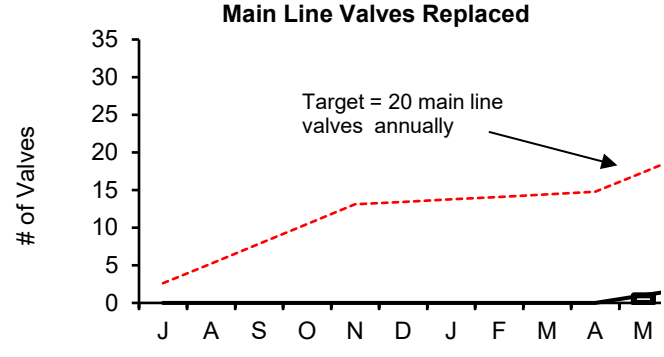
During Q4 of FY23 there was a total of 5160 hours worked. Percentage breakdown; Corrective Maintenance 82%, Preventative Maintenance 6%, Project 12%

Type of Valve	Inventory #	Operable Percentage	
		FY23 to Date	FY23 Targets
Main Line Valves	2,159	96.9%	95%
Blow-Off Valves	1,682	98.8%	95%
Air Release Valves	1,519	96.2%	95%
Control Valves	49	100.0%	95%

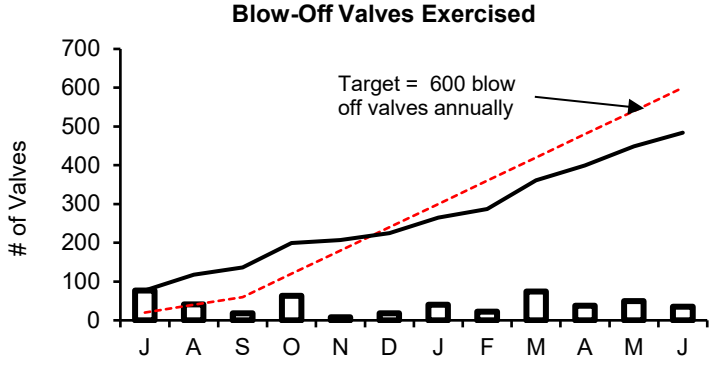




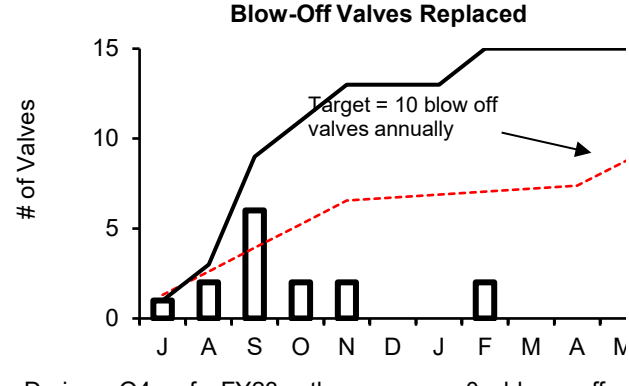
During Q4 of FY23, 138 main line valves were exercised. The total exercised for the fiscal year to date is 582. Below target due to necessary hours spent to support Capital Improvement Projects and in-house construction work.



During Q4 of FY23, there were 2 main line valve replaced. The total replaced for the fiscal year to date is 2. Below target due to staff vacancies.



During Q4 of FY23, 123 blow off valves were exercised. The total exercised for the fiscal year to date is 484.



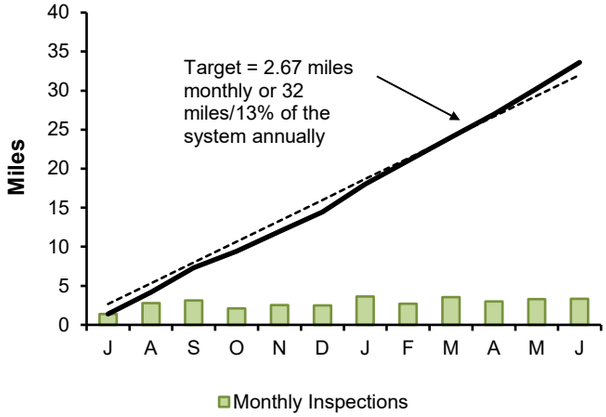
During Q4 of FY23, there were 0 blow off valves replaced. The total replaced for the fiscal year to date is 15.

Wastewater Pipeline and Structure Inspections and Maintenance

4th Quarter - FY23

Inspections

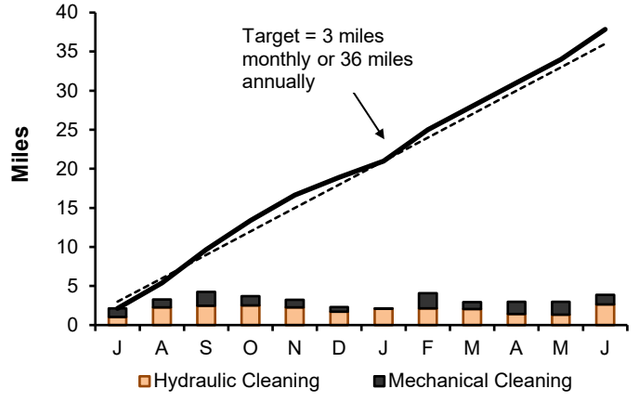
Pipeline Inspections



Staff internally inspected 9.62 miles of MWRA sewer pipe during this quarter.The year to date total is 33.62 miles. No Community Assistance was provided.

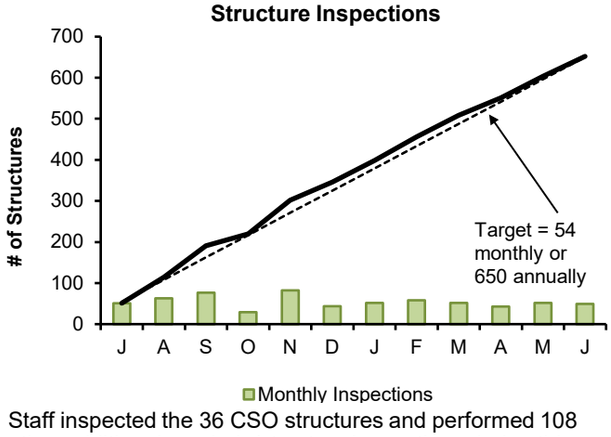
Maintenance

Pipeline Cleaning



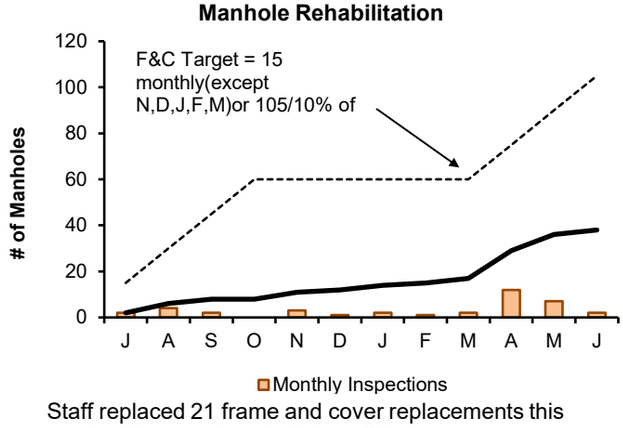
Staff cleaned 9.85 miles of MWRA sewer pipe, and removed 43 yards of grit. The year to date total is 37.85 miles. No Community Assistance was provided.

Structure Inspections



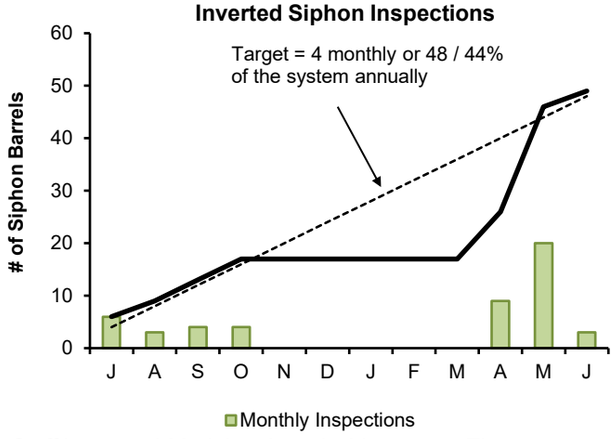
Staff inspected the 36 CSO structures and performed 108 other additional manhole/structure inspections during this quarter. The year to date total is 652 inspections.

Manhole Rehabilitation



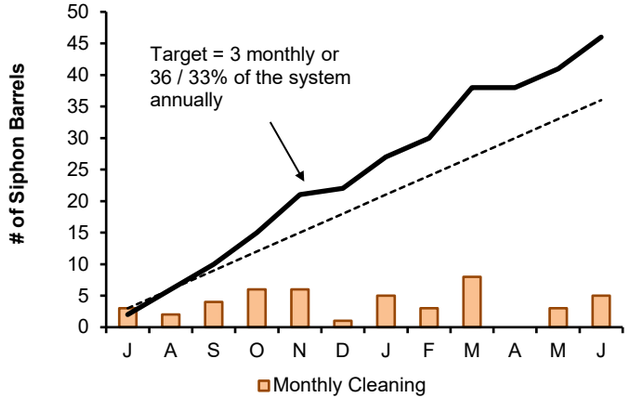
Staff replaced 21 frame and cover replacements this quarter.The year to date total is 38.

Inverted Siphon Inspections



Staff inspected 32 siphon barrels this quarter. The year total is 49 inspections.

Inverted Siphon Cleaning

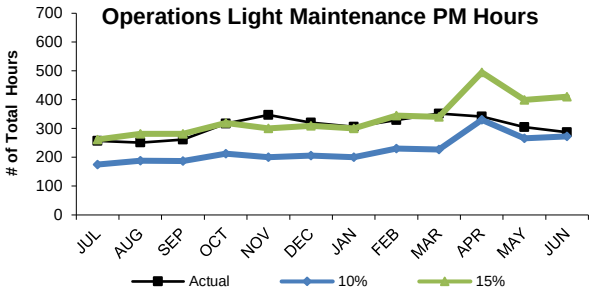


Staff cleaned 8 siphon barrels this quarter.

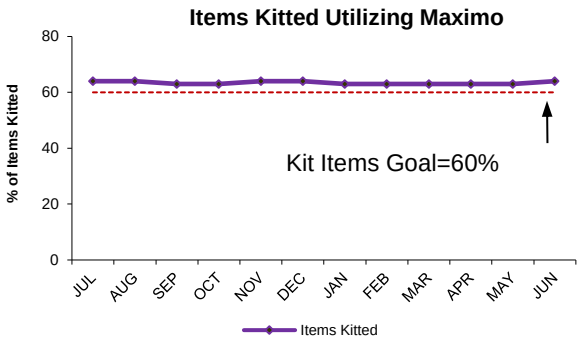
Field Operations' Metropolitan Equipment & Facility Maintenance

4th Quarter - FY23

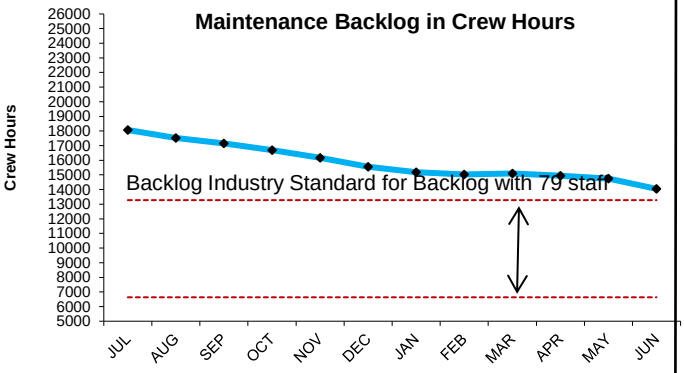
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion is 100%. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus reducing maintenance spending. Backlog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



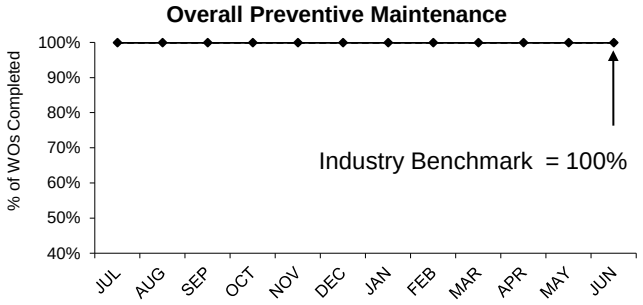
Operations staff averaged 311 hours per month of preventive maintenance during the 4th Quarter of FY23, an average of 11% of the total PM hours for the 4th Quarter, which is within the industry benchmark of 10% to 15%.



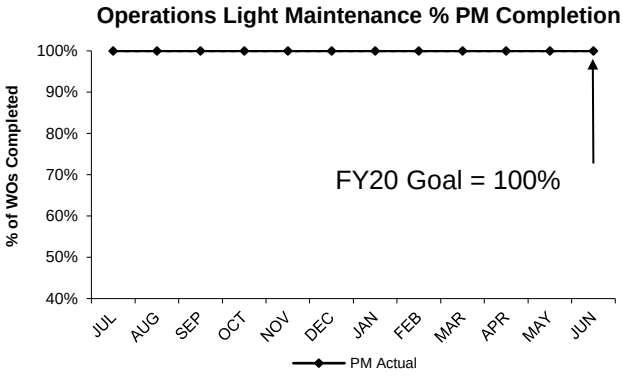
Operations' FY23 maintenance kitting goal has been set at 60% of all work orders to be kitted. Kitting is the staging of parts or material neccesary to complete maintenance work. In the 4th Quarter of FY23, 63% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



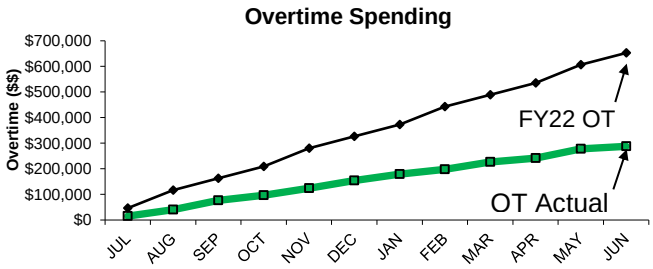
The 4th Quarter of FY23 backlog average is 14,585 hours. Management's goal is to continue to control overtime and try to get back within the industry benchmark of 6,636 to 13,275 hours. The increase is due to vacancies and several large maintenance projects.



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 4th Quarter of FY23.



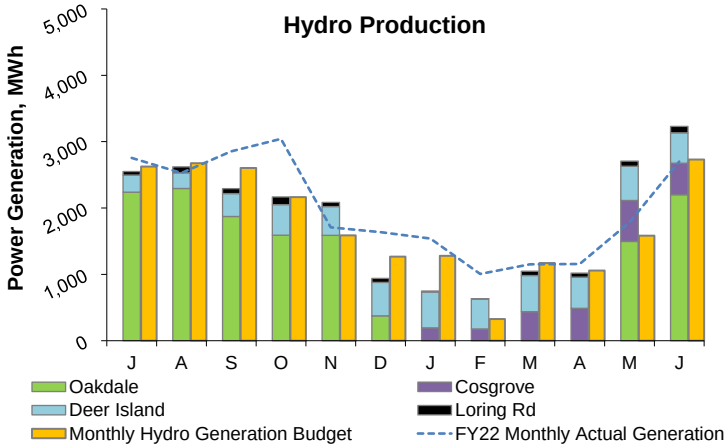
Wastewater Operations complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY23 PM goal is completion of 100% of all PM work orders assigned. Operations completed 100% of PM work orders in the 4th Quarter of FY23.



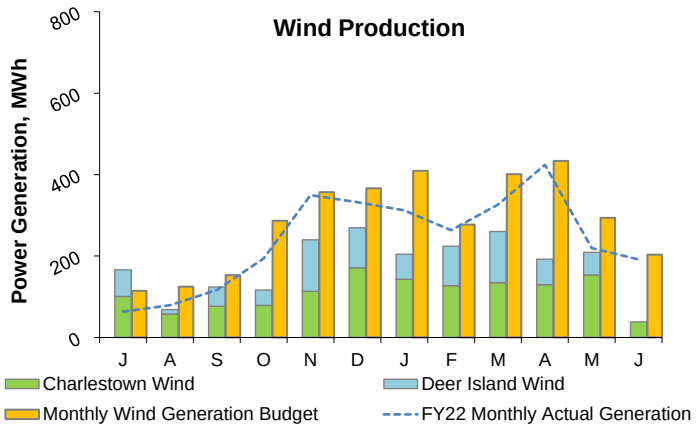
Maintenance overtime was $33,871 under budget on average, per month, for the 4th Quarter of FY23. Overtime is used for critical maintenance repairs and wet weather events. The overtime budget through the 4th Quarter of FY23 is $652,552. Overtime spending was $287,826 which is $364,726 under budget for the fiscal year.

Renewable Electricity Generation: Savings and Revenue

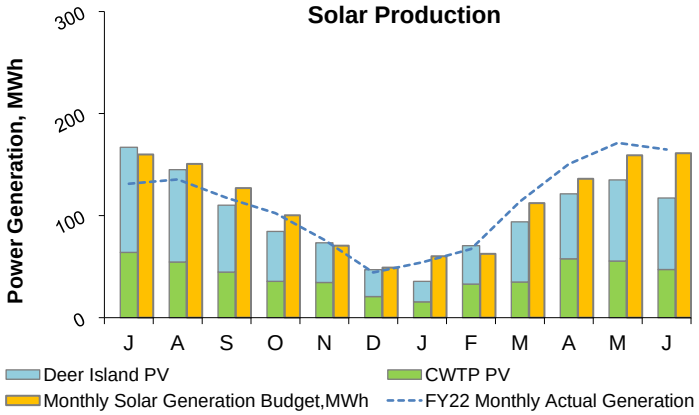
4th Quarter - FY23



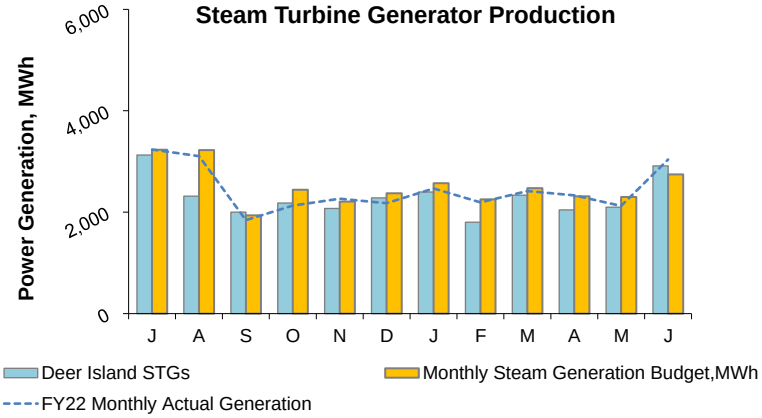
In Quarter 4, the renewable energy produced from all hydro turbines totaled 7,066 MWh; 32% above budget[1].



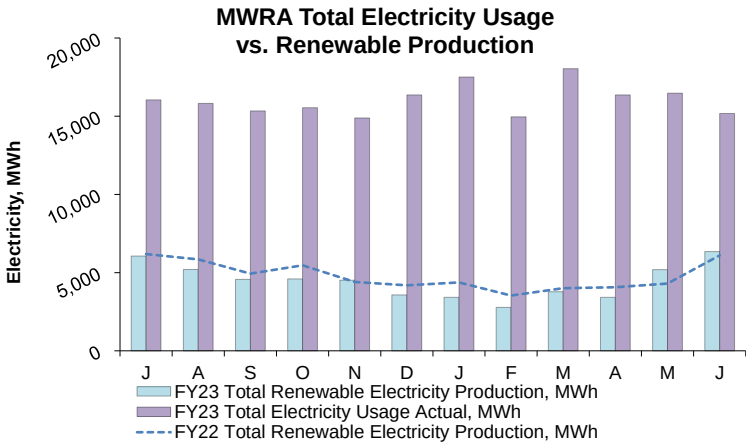
In Quarter 4, the renewable energy produced from all wind turbines totaled 440 MWh; 53% below budget[1]. This shortfall is in large part due to Turbine #2 at Deer Island Treatment Plant being taken offline following the failure of Turbine #1 (which had been out of service since April 2022) on May 29, 2023.

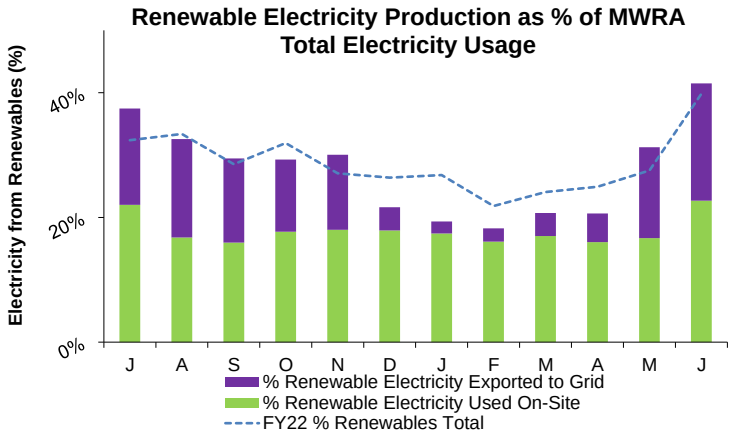


In Quarter 4, the renewable energy produced from all solar PV systems totaled 404 MWh; 12% below budget[1]. The Deer Island Residuals Odor Control roof mounted array has been offline since September 11, 2022 while awaiting replacement parts. The CWTP system was also offline for several days in June, adding to the shortfall in Quarter 4.



In Quarter 4, the renewable energy produced from all steam turbine generators totaled 7,057 MWh; 6% above budget[1].



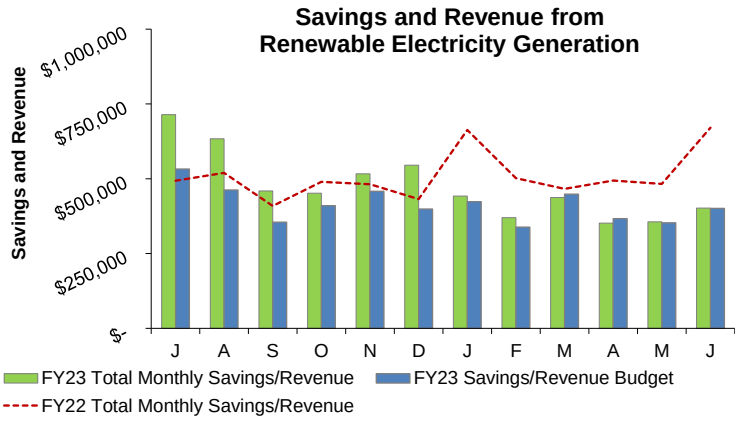


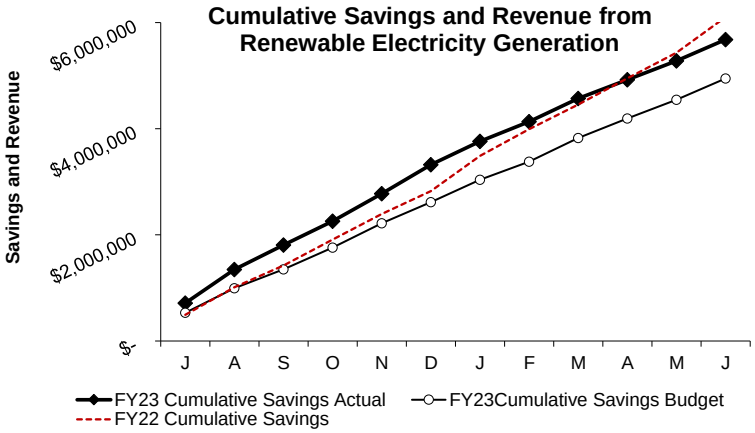
In Quarter 4, MWRA's electricity generation by renewable resources totaled 14,965 MWh, 6% above budget. MWRA's total electricity usage was approximately 48,021 MWh. Renewable resources were 31% of total usage. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and 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. Budget values are based on historical averages for each facility and include operational impacts due to maintenance work.

Renewable Electricity Generation: Savings and Revenue

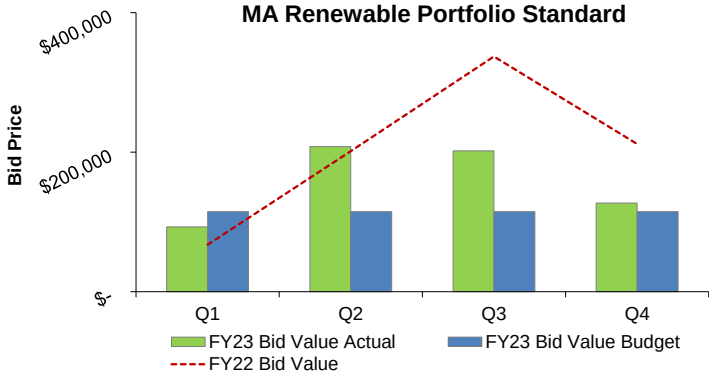
4th Quarter - FY23

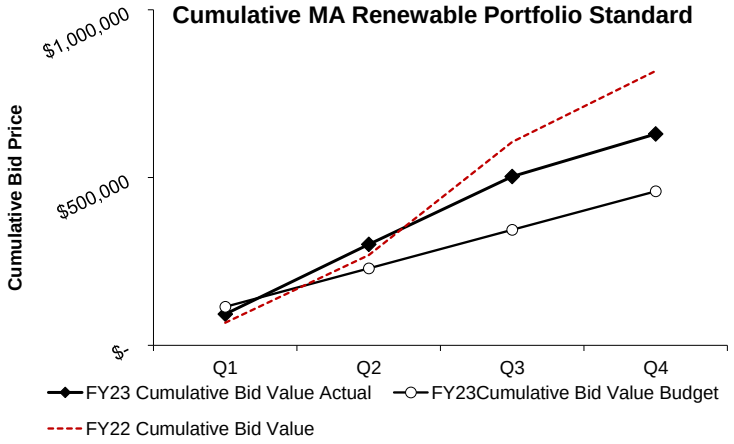




Savings and revenue invoices for Oakdale Hydro have not yet been received for May and June FY23.

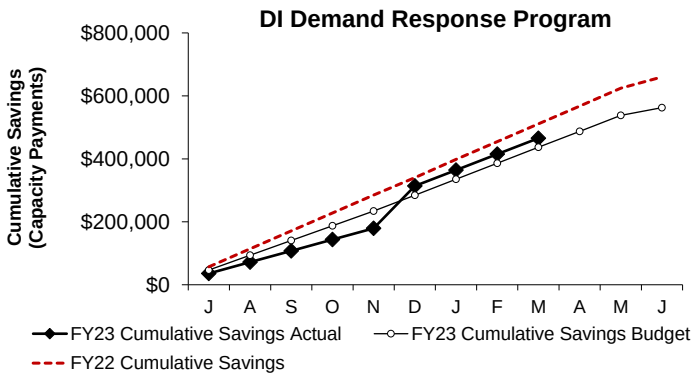
Savings and revenue[1] from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).
The use of DITP digester gas as a fuel source 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).

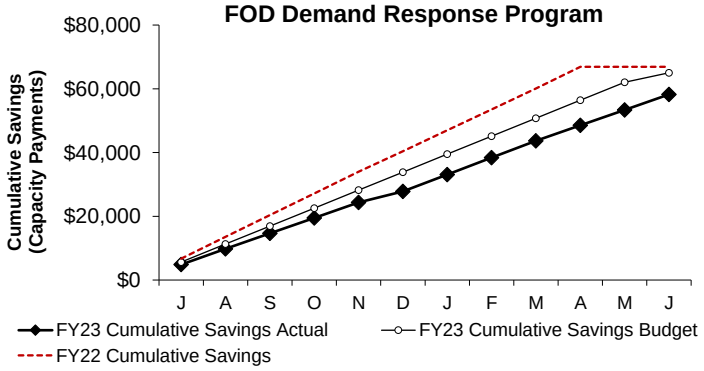




Bids were awarded during the 4th Quarter[2] from MWRA's renewable energy assets; 1,614 Q4 FY23 Class I Renewable Energy Certificates (RECs); and 2,277 Q4 FY23 Class 2 RECs were sold for a total value of $127,053 RPS revenue; which is 11% above budget[3] for the Quarter.
REC values reflect the bid value on the date that bids are accepted. Cumulative bid values reflects the total value of bids received to date.

*MWRA's SRECs have transitioned to the Class 1 REC category starting in FY23.



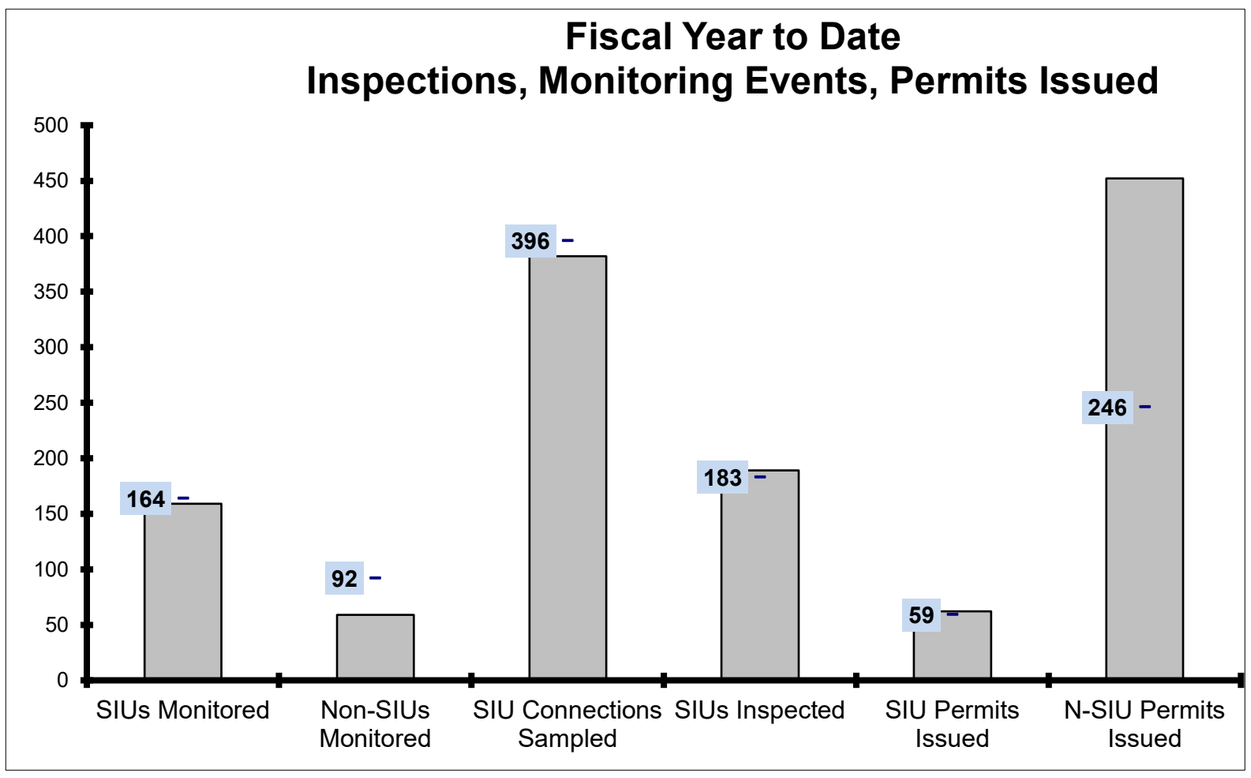


Currently Deer Island, JCWTP, Loring Rd, and Brutsch participate in the ISO-New England Demand Response Programs[4]. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY23 Cumulative savings (Capacity Payments only) through March[2] total $465,523 for DI and payments for FOD total $58,233 through June[2].

Notes:
1. 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.
2. Only the actual energy prices are being reported. Therefore, some of the data lags up to 3 months due to timing of invoice receipt.
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 in June 2016.

Toxic Reduction and Control

4th Quarter - FY23



EPA Required SIU Monitoring Events
for FY23: 164
YTD : **159**

Required Non-SIU Monitoring Events
for FY23: 92
YTD : **59**

SIU Connections to be Sampled
For FY23: 396
YTD: **382**

EPA Required SIU Inspections
for FY23: 183
YTD: **189**

SIU Permits due to Expire
In FY23: 59
YTD: **62**

Non-SIU Permits due to Expire
for FY23: 246
YTD: **452**

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

	0 to 120		121 to 180		181 or more		Permits Issued	
	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU
Jul	1	9	0	3	0	8	1	20
Aug	1	38	1	8	1	18	3	64
Sep	5	14	0	5	0	25	5	44
Oct	5	12	0	3	0	12	5	27
Nov	2	31	0	13	0	16	2	60
Dec	4	31	1	7	1	31	6	69
Jan	18	25	1	5	0	10	19	40
Feb	0	2	0	0	0	15	0	17
Mar	10	30	0	4	0	4	10	38
Apr	2	30	0	0	0	5	2	35
May	5	19	0	0	1	6	6	25
Jun	3	9	0	1	0	3	3	13
% YTD	90%	55%	5%	11%	5%	34%	62	452

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. *In FY23 there were 10 status changes of which 6 were changed from SIU to Non-SIU and 4 were changed to SIUs. There was 1 new SIU permit issued and 1 is now inactive.* In addition to the Annual SIU inspections required under TRAC’s EPA approved Industrial Pretreatment Program, 39 other inspections were completed, including for enforcement, permit renewal, follow up, temporary construction dewatering sites, group/combined permit audits, spot, sampling locations, visit only and out of business facility. Monitoring of SIUs and Non-SIUs is dynamic for several reasons, including: newly permitted facilities; sample site changes 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 sometimes increased/decreased inspections lead to permit category changes requiring additional monitoring

This is the end of the 4th quarter of the MWRA fiscal year, FY23.

In the 4th quarter, of the 84 permits issued, there were 11 SIUs. All but 1 of the SIUs were issued within the 120-day timeframe with 1 issued beyond the 120-day timeline.

At the end of the FY23 fiscal year, 514 permits have been issued, 62 were SIUs.
90% of the SIU permits were issued within the 120-day timeframe, with 5% issued beyond 180 days. This meets the EPA benchmark requirement.

There were 452 non-SIU permits issued, of which 202 were issued beyond the 120-day timeline.

Reasons for late issuances continued 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 FY23, there were 226 completely new permits issued: 2 SIUs and 223 N-SIUs among which were 25 Cat 02s, 1 cat 01, 2 One-Time Discharge, 74 Low Flow Permits, 105 Dental, 2 Food Processing, 1-Septage and 14-Construction dewatering.

Field Operations Highlights
4th Quarter – FY23

Western Water Operations and Maintenance

- Carroll Water Treatment Plant – Staff installed duct insulation on the HVAC units in the PT building near the lead pipe rigs to prevent condensation. Plant operations staff continue support construction projects for chemical feed updates and SCADA controls upgrade.

- Brutsch Water Treatment Facility – Staff replaced actuator on the primary flow control sleeve valve for the Chicopee Valley Aqueduct as well as cleaned and inspected the internal parts of the sleeve valve while it was out of service. Chicopee Valley Aqueduct back pressure sustaining valves adjusted to normal summer flow conditions.

- Wachusett Dam and Bastion Building – Staff installed stop logs in the upper gatehouse bay 1 as well as dewatered the lower gate house cells 1, 2 and 3 to support the pipe replacement project. Staff participated in the final walk through for the Bastion rebuild project as well as operated Crest Gate and angle pattern release valve for flood control purposes.

- Reservoir Operations, Misc. - Reservoirs Terrestrial Spill Response Training held at Wachusett watershed on 06.07.23. New Wachusett Spill Response Trailer was fitted out by Western Carpenters and deployed to Reservoir. Staff responded to an SSO at Wachusett Reservoir on 06.28.23.

Operations Engineering

- Staff continued to provide technical support for Design and Construction Contracts including; Low System PRV Upgrades, Columbus Park and Ward St Headworks, Upgrades, Nut Island Odor Control Improvements, Hayes Pump Station Upgrades, NEH improvements, WASM3 CP1 and CP2, Section 101, Storage Tank Improvements, Section 23, 24 and 47 Rehabilitation, Shaft Improvements, IHS Improvement, Hydraulic Model upgrades, BWRPS Upgrades and Section 89 Replacement.
- Staff continued to monitor the wet scrubber system and continued supporting the development of the facility manual and training.
- Hydraulic Model Upgrades: Staff continued to provide an in-depth review of the draft model and review of calibrations.
- Staff continued to support Pipeline and Valve Programs with some of the following activities: Operation Shutdown Plans, Exercise Schedule Packages and Disinfection Plans and Permitting;
- Staff provided support for system expansion to the north and south and to the Metro communities.
- Staff have provided support to the city of Newton for the disinfection and reactivation of their covered storage tank.
- Provide daily facility flow data to support Biobot Study.
- Staff continued to support the lead loop 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 and provided follow up on operational and SCADA issues.
- Staff performed a lead role in the fluoride tracer study.

SCADA

- Water System: Continued technical support for JCWTP PLC replacement project; configured and hardened SCADA Operating system; continued work on network management improvements in the JCWTP SCADA system; supported Brutsch sodium hypochlorite system project; supported fluoride controller installation.

- Wastewater system: Continued work on Ward/Columbus, Hayes P.S. Improvements, Braintree/Weymouth Pump Station Improvements Project, and Fuel Tank Replacement Project; continued work on new limit switch system for Chelsea Creek influent gates.

TRAC

Compliance and Enforcement

- TRAC issued 12 Notices of Noncompliance, 31 Notices of Violation, 2 Return to Permit Letters, 3

Extension Letters, and 1 Penalty Assessment Notice in the amount of $40,000.00

Inspections and Permitting

- TRAC issued a total of 74 MWRA 8(m) Permits allowing companies to work within an easement or other property interest held by the Authority. Permits issued this quarter were issued in an average of 65 days from the date the application for 8(m) permit was received by the MWRA.

- TRAC monitored the septage receiving sites a total of 30 times. Staff conducted inspection at 81 new construction gasoline/oil separators and 203 existing gasoline/oil separators.

- TRAC staff conducted 18 Annual SIU Inspections and 218 other inspections.

- 81 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.

Environmental Quality-Water

- **Algae:** DCR and MWRA staff continued to collect algae samples at Wachusett and Quabbin Reservoirs. Low levels of nuisance algae were identified, but all were well below levels of concern.

Community & In-House Support

- Community Support: On April 7, staff provided coliform sampler training to 34 Operations and Enforcement staff at Boston Water and Sewer Commission.

- Sampling & Analysis: Throughout the quarter, staff conducted sampling at at six sites at WASM-4 in Newton and the new Quabbin Administration well and pipeline. The CWTP lead pipe-rig study sampling continued and samples were collected approximately every 2 weeks.

- Projects: Staff worked with CWTP, Operations Engineering, and E&C staff to plan and execute a fluoride tracer study on June 12. EnQual Water trained all field volunteers on portable fluoride meter use and the sampling plan. Field and laboratory fluoride testing performed and hydraulic model revised and updated based on system configuration and demands during the study.

Data Management: Staff continued to work with Planning to review all fully and partially-served community draft annual Consumer Confidence Reports.

Environmental Quality-Wastewater

- Ambient Monitoring: The spring and early summer water column surveys and the annual flounder monitoring survey were completed. A summary report of monitoring in Cape Cod Bay for 2020-2022 has been completed and posted on our webpage.

- Harbor/CSO Receiving Water Monitoring: Biweekly harbor monitoring continues, along with seasonal CSO receiving water sampling.

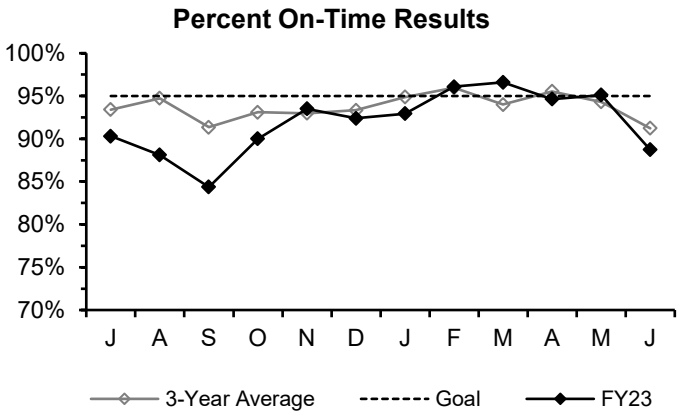
- Permitting and Compliance Reporting: Submitted monthly and quarterly discharge monitoring reports, annual Clinton collection system O&M report, and as-needed notifications of CSOs and blending. The new Clinton permit became effective April 1, 2023. Staff submitted comments to EPA on new requirements seen in draft permits, and began preparing comments on the draft permit for the Deer Island Treatment Plant, which was issued on May 31. Submitted revised final plan for CSO notifications as required by MassDEP, and installed signs at public access areas as required by that plan.

- Cooperation with other agencies: Continued follow up communication with metro Boston CSO permittees about the new sewage notification regulation, and printed and distributed signs for public access locations. Discussed new EPA permit requirements for climate-change planning with NACWA and with other MA wastewater utilities. Staff attended meetings and conferences, including the Massachusetts Bays Partnership, the Stellwagen Bank National Marine Sanctuary Advisory Council, and the Stone Living Lab conference on Nature-Based Coastal Resilience in Urban Settings.

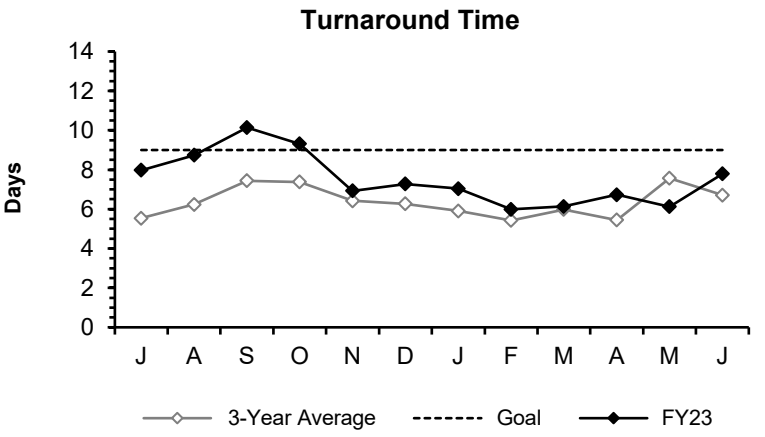
Laboratory Services

4th Quarter - FY23

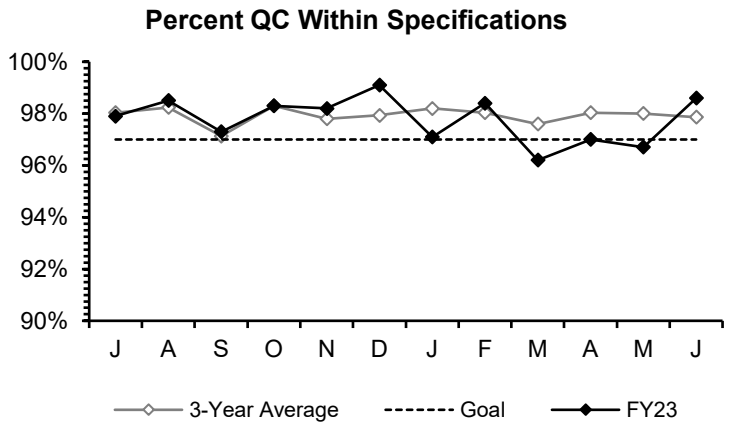
Laboratory Services supports the laboratory sampling, testing, and consulting needs of various client groups primarily in the Operations Division. This includes drinking water transmission and treatment, wastewater collection and treatment, wastewater residuals management, industrial-pretreatment monitoring, and environmental quality.



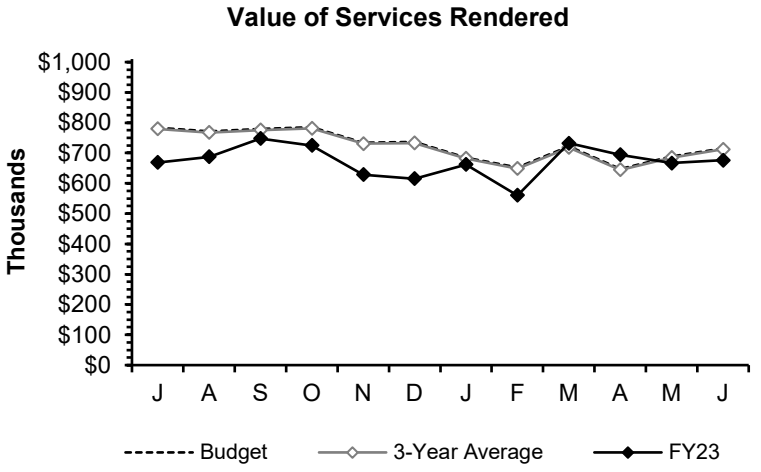
The Percent On-Time measurement assesses performance against internal client due dates. These due dates are shorter than the compliance reporting requirements to allow for internal review of the data.



Turnaround Time measures the average time from sample receipt to sample completion.



Percent QC Within Specifications measures the fraction of Quality Control tests that met required limits during the month.



Value of Services Rendered models the true cost of the lab work performed, including fringe benefits that are not a part of the Laboratory Services budget.

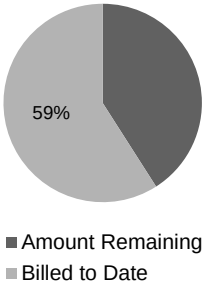
Performance Summary: Only the Turnaround Time goals were met for every month in the 4th quarter. The other measures missed their goals for one or two months during the 4th quarter. This was largely due to continued staffing vacancies.

School Lead Program: MWRA's lab completed 248 lead and copper tests from 66 schools and childcare facilities in 31 communities during FY23. Since 2016, MWRA's Laboratory has conducted over 40,000 tests from 560 schools and daycares in 44 communities. We have also completed 864 home lead tests under the DPH sampling program since 2017. Overall MWRA's lab completed 2629 drinking water lead and copper tests in FY23.

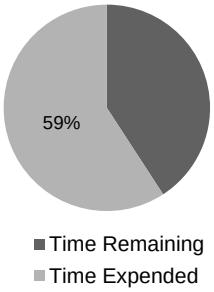
CONSTRUCTION PROGRAMS

Projects In Construction
4th Quarter – FY23

Cost



Time



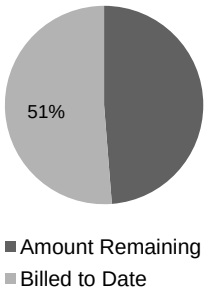
Carroll Water Treatment Plant SCADA Improvements

Project Summary: The current SCADA control equipment has reached the end of its useful life, and future vendor support for the installed PLC base is no longer guaranteed. This contract includes the supply and installation of replacement instrumentation panels, PLC's, UPS backup power, fiber-optic communication network, wiring between the existing panels, and new equipment and refurbishment of the operator control room. In addition, a new server room equipped with HVAC and fire suppression is being constructed to house redundant computer hardware supporting active and backup SCADA systems.

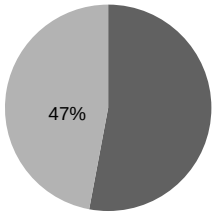
Contract Amount: $13,160,147.52 *Contract Duration:* 1,127 Days

Notice to Proceed: 1-Sep-21 *Contract Completion:* 2-Oct-24

Cost



Time



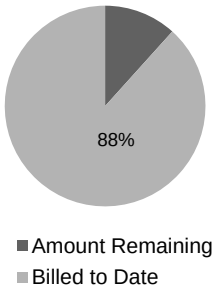
Section 89 Replacement Pipeline

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.

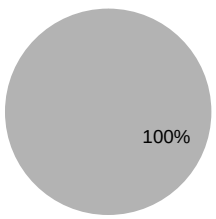
Contract Amount: $32,869,000 *Contract Duration:* 1,475 Days

Notice to Proceed: 5-Aug-21 *Contract Completion:* 19-Aug-25

Cost



Time



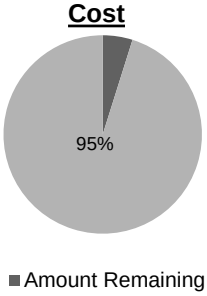
Low Service PRV Improvements

Project Summary: This project will demolish the existing Nonantum Road and Mystic Valley Parkway PRV vault structures, including four 24-inch PRVs and appurtenances, and construct new, larger cast-in-place vaults. At Mystic Valley Parkway, two 42-inch PRVs and at Nonantum Road two 30-inch PRVs, isolation valves, piping, and other appurtenances will be installed. Additionally, a new master meter will be constructed at the Mystic Valley Parkway pressure reducing valves and the existing master meter located near the Nonantum Road pressure reducing valves will be upgraded to accommodate the increased flow.

Contract Amount: $12,088,167.10 *Contract Duration:* 720 Days

Notice to Proceed: 14-Jul-21 *Contract Completion:* 4-Jul-23

Cost



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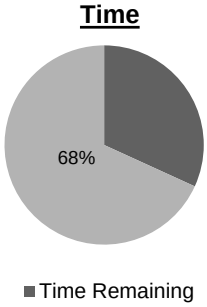


Rehabilitation of WASM 3

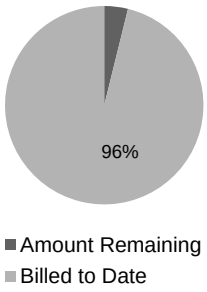
Project Summary: This construction contract includes rehabilitation of approximately 13,800 feet of 56-inch and 60-inch diameter water main in Arlington, Somerville and Medford. The rehabilitation consists of cleaning and internal cement mortar lining the pipe and adding valves for better operational flexibility. In addition, two old 36-inch valves are being removed to eliminate reduced sections of pipe..

Contract Amount: $20,175,619.6 *Contract* Duration: 1,383 Days

Notice to Proceed: 28-Oct-20 *Contract Completion:* 11-Aug-24

Projects In Construction
4th Quarter – FY23

Cost



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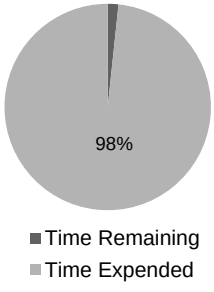


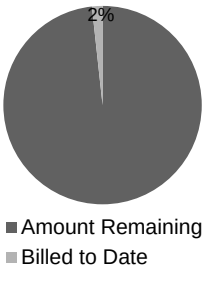
Nut Island Odor Control and HVAC

Project Summary: This project will provide upgrades to the odor control system, heating, ventilation and air conditioning system and other equipment. Most of the equipment is at or near the end of its useful life and replacement is required to ensure the continued reliability of this critical facility. This contract will also provide reconfiguration of ductwork serving the odor control system to expand the system's operational flexibility, and will improve surface access into the below-grade odor control room, the need for which was made evident during the January 2016 fire.

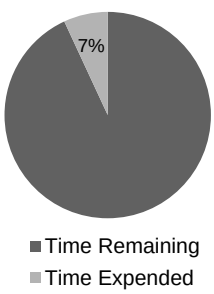
Contract Amount: $60,444,537.28 *Contract Duration:* 1,084 Days

Notice to Proceed: 12-Feb-20 *Contract Completion:* 10-Jun-23

Cost



Time



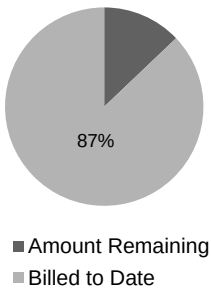
Clarifier Rehabilitation Phase 2

Project Summary: This project involves the replacement of the original remaining scum and sludge equipment, as follows: over 400 Primary Clarifier influent, effluent, and dewatering gates; 384 primary effluent cross channel gate actuators; approximately 450 secondary scum influent gates and actuators; wear strip rails,768 head shaft and idler sprockets; over 3000 linear feet of influent channel aerations piping systems; 360 head shafts collector drives and chains; return sludge line vent piping; approximately 400 concrete and aluminum hatches and associated electrical and control systems.

Contract Amount: $289,359,690 *Contract Duration:* 1620 Days

Notice to Proceed: 10-Mar-23 *Contract Completion:* 16-Aug-27

Cost



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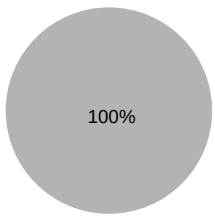


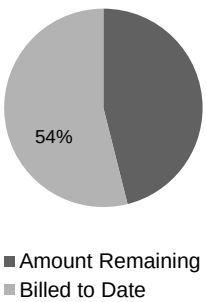
DITP Odor Control Damper Replacement

Project Summary: This project includes 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. The damper and piping are part of the odor control system that serves the sludge wet wells in the centrifuge building at the Deer Island Treatment Plant.

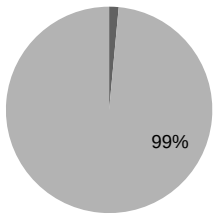
Contract Amount: $539,701 *Contract Duration:* 455 Days

Notice to Proceed: 3-Feb-22 *Contract Completion:* 4-May-23

Cost



Time



Clinton Screw Pump Replacement

Project Summary: This project involves demolishing and replacing the three screw pumps and motors, replacing three existing 72-inch by 60-inch pump isolation slide gates and associated electrical and controls; providing a temporary bypass pumping system to ensure the plant's pumping capacity is maintained during the construction phase; and providing concrete remediation in the pump channels.

Contract Amount: $3,452,985 *Contract Duration:* 540 Days

Notice to Proceed: 14-Jan-22 *Contract Completion:* 8-Jul-23

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CSO CONTROL PROGRAM

4th 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. April 2023 Annual report shows an 88% reduction in CSO in a typical year, from 3.3 billion gallons to 396 million gallons, with 72 of 86 outfalls meeting the LTCP goals for CSO activation frequency and volume. MWRA and its member CSO communities have already completed construction at BOS003, BOS004 and CHE008 and are moving forward with plans to bring an additional 7 CSOs in line with the LTCP goals. With respect to the remaining 6 challenging CSO outfalls, MWRA and its CSO Consultant (AECOM) continue to investigate alternative to move closer to LTCP goals.

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.

- AECOM continues to support efforts to advance project identified to meet performance goals at 8 of the 16 CSOs that didn't meet LTCP goals, evaluate alternatives for the remaining 6 challenging sites, and predict and report on annual CSO discharges. Two of those 16 outfalls are now meeting LTCP goals (BOS014 and BOS003) and the post construction performance of CHE008 is being evaluated.

Court Ordered Levels of CSO Control

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 **6/22/23** and the next meeting is scheduled for **9/28/23**

Ongoing Projects as of December 31, 2022

- *East Boston CSO Control*: As part of the East Boston CSO a FAA/MOU was executed in June 2021 for $2.1M, BWSC design and construction. Work at BOS014, BOS003 is complete and are now meeting LTCP goals. Sewer separations is expected to be completed in fall 2023. Plans for Phase 4 sewer separation with five new contracts starting in 2023 (through 2028) will result in most of East Boston being separated.
- *CHE008 Pipe Replacement – Enlarging the CHE008 regulator connection is now complete (July 2023).*
- *Somerville Marginal New Pipe Connection* came out of the variance optimization study that recommended adding a new pipe from the facility's CSO influent conduit to the interceptor with an added control gate. The $1.2M (est.) construction project is expected to be completed by December 2024.

- *Fort Point Channel and Mystic Confluence* - BOS062, BOS065, BOS070 DBC and BOS017: FAA/MOU established to design and construct improvement at these 4 CSOs. 90% design submitted August with an updated cost estimate of $7.2M including a 5% contingency. Anticipate completion of construction by December 2024.

CSO variances

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 on **5/11/2022**. The Authority is currently working closely with the CSO communities of Cambridge and Somerville to develop these plans over the upcoming years.
- A request to extend the deadline for completion of the Updated CSO Control Plan by 36 months was submitted on 9/22/22. In May 2023, MassDEP and EPA both approved this extension and instructed MWRA, Cambridge, and Somerville to proceed in accordance with the requested revised schedule.
- As identified in the variance the progress is reported at monthly meetings with EPA/MassDEP. The last meeting was on **8/9/23** and the next meeting is scheduled for **9/13/23**. Key elements of the Updated CSO Control Plan are discussed including the development of an Updated Typical year which includes climate change and the development of a Unified Hydraulic Model.
- The 2nd of 8 planned meetings was held on 12/15/22. **The next Public Meeting is scheduled for late fall of 2023.**
- Development and Submittal of Studies as required under variance included the following:
    - Alewife PS Optimization Evaluation was submitted on 4/27/2021
    - Somerville Marginal CSO Reduction, Study and Preliminary Design was submitted on 12/27/2021
    - Alewife Brook and Charles River System Optimization Evaluation was submitted on 12/28/2022
    - MWRA CSO Variances Additional System Optimization Measures Report was submitted on 1/31/2023.
- Bi-annual meeting with CLF/Watershed groups held on 7/12/2023 providing an update on the 16 sites not currently meeting the LTCP.

CIP Expenditures

4th Quarter – FY23

FY23 Capital Improvement Program Expenditure Variances through June by Program - ($ in thousands)				
Program	FY23 Budget Through June	FY23 Actual Through June	Variance Amount	Variance Percent
Wastewater	$109,752	$57,630	($52,122)	-47%
Waterworks	$133,079	$89,470	($43,609)	-32%
Business and Operations Support	$35,222	$24,079	($11,144)	-31%
Total	$278,053	$171,178	($106,875)	-38%

Wastewater:

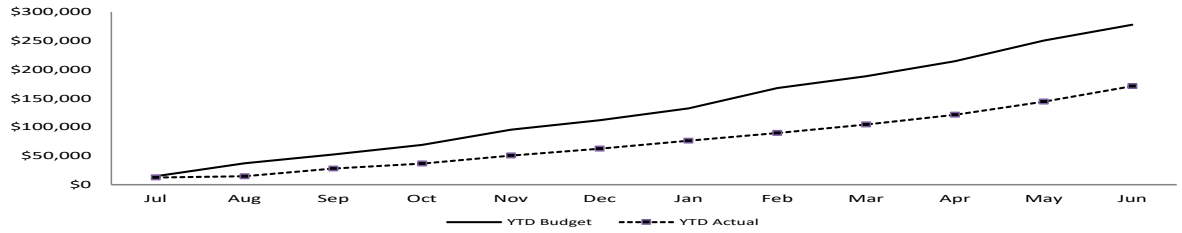
- Underspending due to timing of grant and loan distributions for the I/I Local Financial Assistance program
- Updated schedules for Primary & Secondary Clarifier Rehab Phase 2 Construction, DITP Roof Replacement, DITP Motor Control Center & Switchgear Replacement - Construction & Design/ESDC/REI, Dystor Membrane Replacements, Digester Cover Replacement, and Fire Alarm System Replacement – Construction
- Completion of some design and inspection tasks were later than anticipated for Ward Street and Columbus Park Headworks Upgrades Design/Construction Administration
- Contractor behind schedule for the Nut Island Odor Control and HVAC Improvements
- Timing of work for South System Pump Station VFD Replacement Design/ESDC/REI

Water:

- Underspending in Waterworks was due to timing of community distributions for the Water Loan program, as well as timing of work for Geotechnical Support Services
- Long lead time for piping materials and permit issues for Waltham Water Pipeline Construction and REI
- Long lead time for materials for Wachusett Lower Gatehouse Pipe & Boiler Replacement - Construction
- Updated schedules for Quabbin Maintenance Garage/Wash Bay/Storage Building, and CP-2 Shaft 5 Construction
- Scope changes for Cathodic Protection Shafts E, L, N & W
- This underspending was partially offset by contractor progress for NIH Section 89 & 29 Replacement, and CP-1 NEH Improvements, and timing of consultant work for Metropolitan Tunnel Redundancy Preliminary Design & Massachusetts Environmental Policy Act Review

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 6/30/23	$150.1 million
Unused capacity under the debt cap:	$2.1 billion
Estimated date for exhausting construction fund without new borrowing:	OCT-23
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding: Commercial paper capacity / Revolving Loan	$55 million $195 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

4th Quarter – FY23

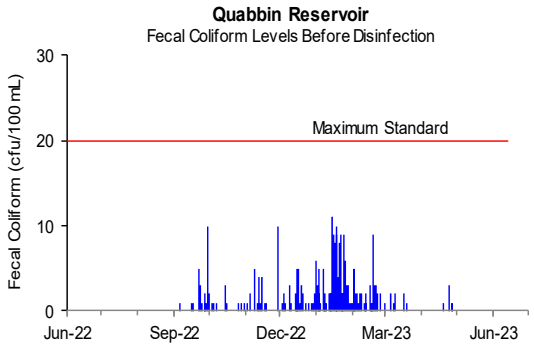
Source Water – Microbial Results

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.**

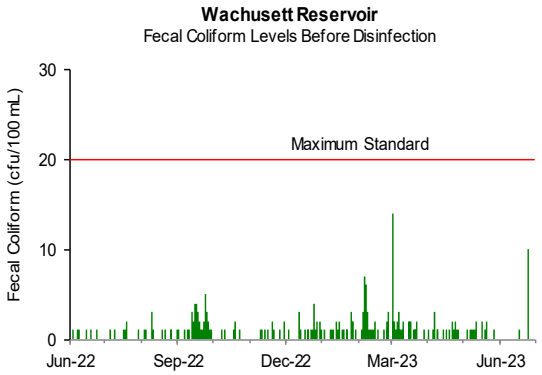


Sample Site: Wachusett Reservoir

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 4th Quarter were below 20 cfu/100mL. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

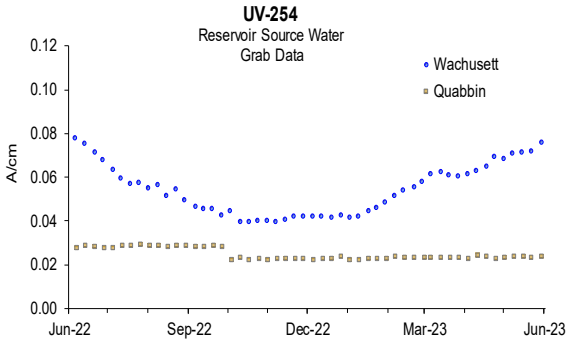


Source Water – UV Absorbance

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 0.023 A/cm for the quarter.

Wachusett Reservoir UV-254 levels averaged 0.069 A/cm for the quarter.



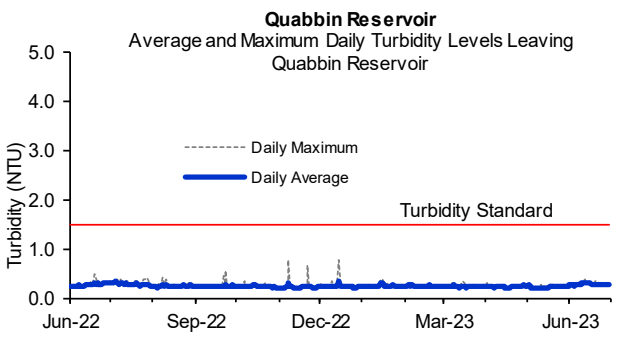
Source Water – Turbidity

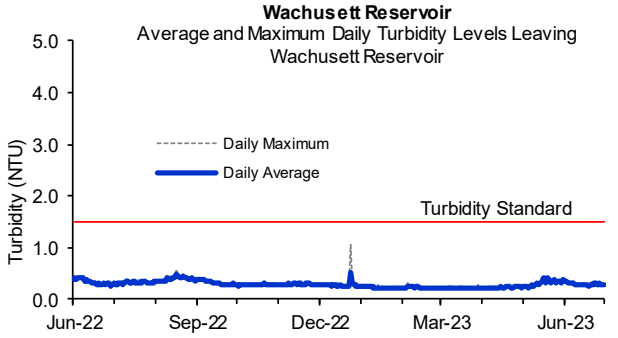
4th Quarter – FY23

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.



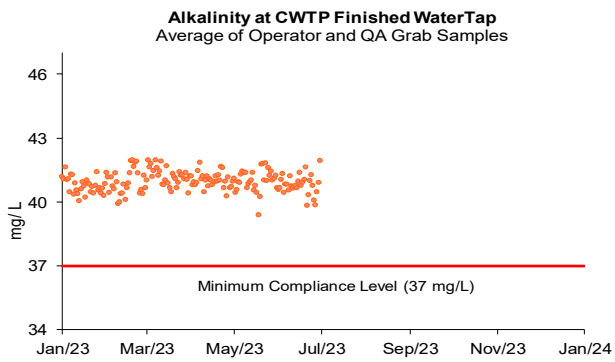


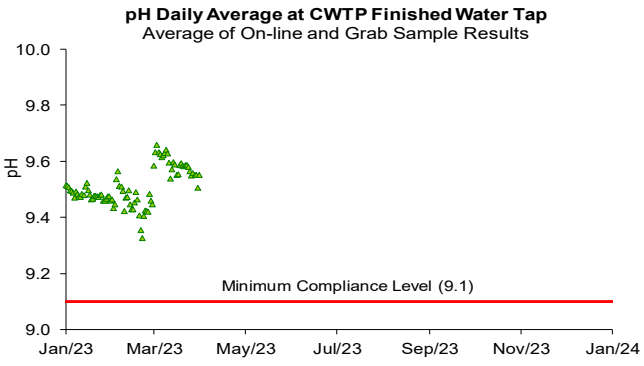
Treated Water – pH and Alkalinity Compliance

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 June. Distribution system sample pH ranged from 9.4 to 9.8 and alkalinity ranged from 39 to 42 mg/L. No sample results were below DEP limits for this quarter.





Treated Water – Disinfection Effectiveness

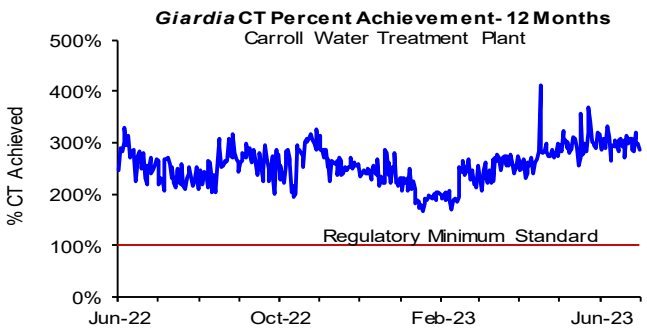
4th Quarter – FY23

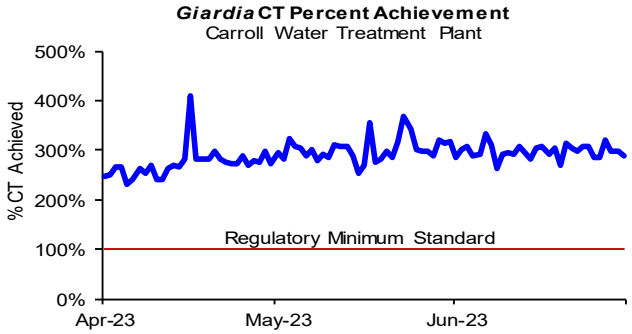
At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA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

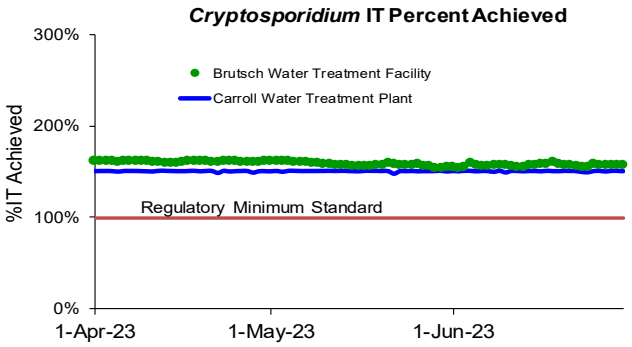
- The chlorine dose at the CWTP varied between 3.35 and 3.90 mg/L for the quarter.
- Ozone dose at the CWTP varied between 1.7 to 3.0 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- *Cryptosporidium* IT was maintained above 100% for the quarter. Off-spec water was less than 5%.

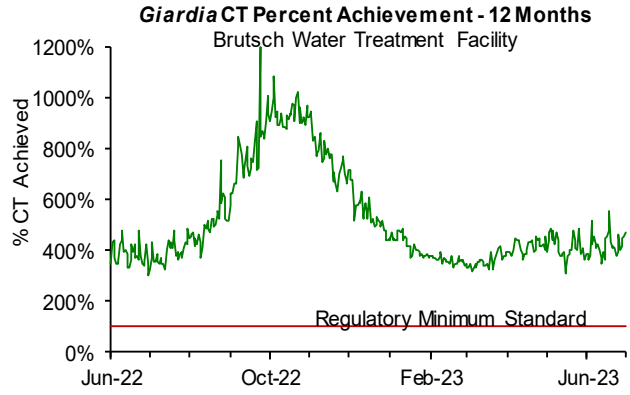


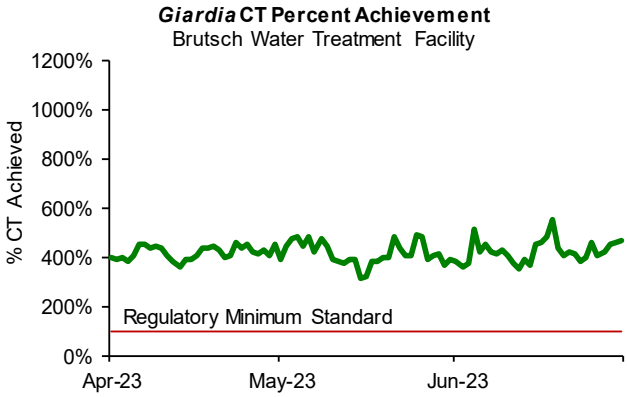


Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal target of 0.75 - 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 1.30 to 1.55 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%.







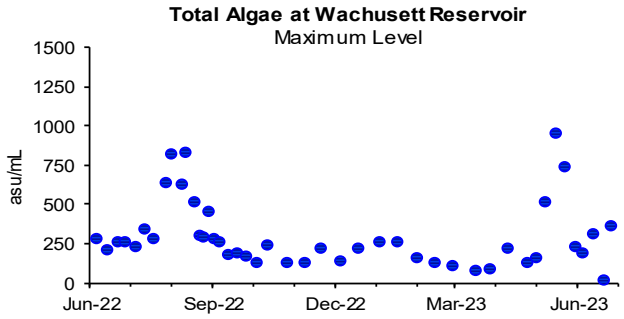
Source Water - Algae

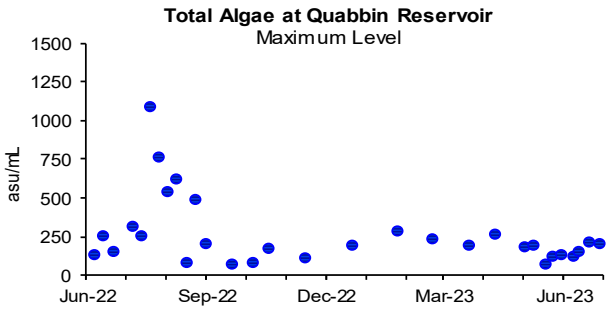
4th Quarter – FY23

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 4th quarter, there were no complaints which may be related to algae reported from the local water departments.



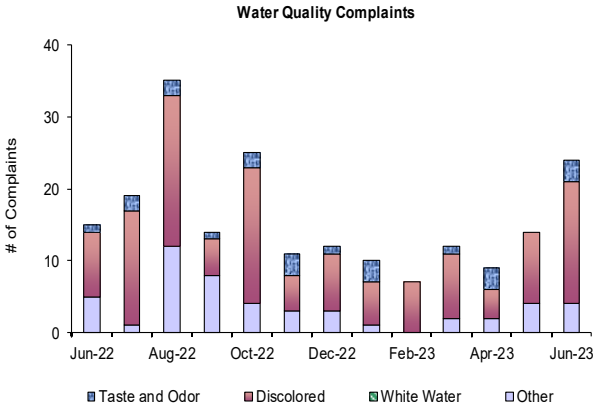


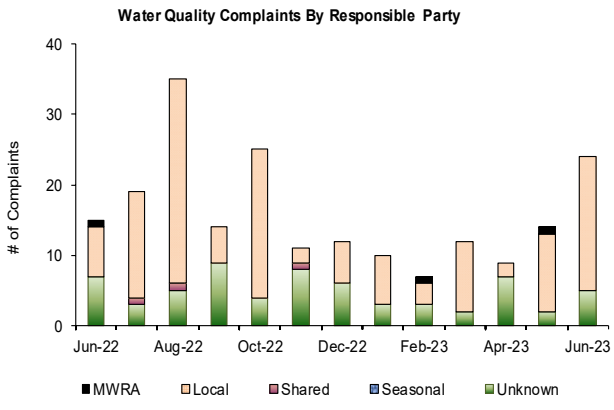
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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 47 complaints during the quarter compared to 42 complaints from 4th Quarter of FY22. Of these complaints, 31 were for "discolored water", 6 were for "taste and odor", and 10 were for "other". Of these complaints, 32 were local community issues, 1 was a shared local community and MWRA related issue, and 14 were unknown in origin. Twenty-four discolored water complaints were due hydrant flushing being performed in Somerville during May and June. Two discolored water complaints were due hydrant flushing being performed in Northborough during April and June.





Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

4th 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 4th Quarter, eight of the 6,276 samples (0.13% system-wide) submitted to MWRA labs for analysis tested positive. One of the 1899 Community/MWRA shared samples (0.05%) tested positive for total coliform. None of the 271 CVA/MWRA community samples tested positive for total coliform. No communities were required to perform a Level Assessment. No samples confirmed for *E.coli*. None of the Fully Served community samples had chlorine residuals lower than 0.2 mg/L for the quarter.

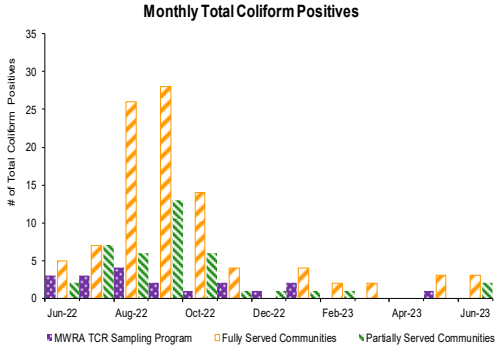
NOTES:

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

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

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

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



			Total Coliform # Samples (b)	Total Coliform # (%) Positive	*E.coli* # Positive	Assessment Required
MWRA	a	MWRA Locations	398	0 (0%)	0	
	a	Shared Community/MWRA sites	1501	1 (0.07%)	0	
		Total: MWRA	1899	1 (0.05%)	0	No
Fully Served		ARLINGTON	169	0 (0%)	0	
		BELMONT	104	0 (0%)	0	
		BOSTON	797	6 (0.75%)	0	No
		BROOKLINE	237	0 (0%)	0	
		CHELSEA	169	0 (0%)	0	
		DEER ISLAND	52	0 (0%)	0	
		EVERETT	169	0 (0%)	0	
		FRAMINGHAM	237	0 (0%)	0	
		LEXINGTON	120	0 (0%)	0	
		LYNNFIELD	18	0 (0%)	0	
		MALDEN	234	0 (0%)	0	
		MARBLEHEAD	72	0 (0%)	0	
		MARLBOROUGH	126	0 (0%)	0	
		MEDFORD	192	0 (0%)	0	
		MELROSE	117	0 (0%)	0	
		MILTON	102	0 (0%)	0	
		NAHANT	30	0 (0%)	0	
		NEWTON	279	0 (0%)	0	
		NORTHBOROUGH	48	0 (0%)	0	
		NORWOOD	99	0 (0%)	0	
		QUINCY	324	0 (0%)	0	
		READING	130	0 (0%)	0	
		REVERE	195	0 (0%)	0	
		SAUGUS	104	0 (0%)	0	
		SOMERVILLE	252	0 (0%)	1	
		SOUTHBOROUGH	30	0 (0%)	0	
		STONEHAM	91	0 (0%)	0	
		SWAMPSCOTT	57	0 (0%)	0	
		WALTHAM	216	0 (0%)	0	
		WATERTOWN	143	0 (0%)	0	
		WESTON	45	0 (0%)	0	
		WINTHROP	66	0 (0%)	0	
		Total: Fully Served	*5024*	*6 (0.12%)*		
Partially Served	c	BEDFORD	54	0 (0%)	0	
	c	BURLINGTON	139	0 (0%)	0	
	c	CANTON	91	1 (1.10%)	0	No
	c	NEEDHAM	126	1 (0.79%)	0	No
	c	PEABODY	209	0 (0%)	0	
	c	WAKEFIELD	130	0 (0%)	0	
	c	WELLESLEY	114	0 (0%)	0	
	c	WILMINGTON	87	0 (0%)	0	
	c	WINCHESTER	94	0 (0%)	0	
	c	WOBURN	208	0 (0%)	0	
		Total: Partially Served	*1252*	*2 (0.16%)*		
		Total: Community Samples No CVA	*6276*	*8 (0.13%)*		
CVA	d	MWRA CVA Locations	104	0 (0%)	0	
	d	CHICOPEE	62	0 (0%)	0	
	d	SOUTH HADLEY FD1	60	0 (0%)	0	
	d	WILBRAHAM	45	0 (0%)	0	
		Total: CVA	*271*	*0 (0%)*		

Chlorine Residuals in Fully Served Communities

	2022							2023					
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
% <0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% <0.2	0.0	0.1	0.3	0.4	0.5	0.8	0.2	0.1	0.1	0.1	0.0	0.0	0.0
% <0.5	0.5	1.4	1.6	1.8	2.1	2.4	1.5	1.2	0.7	0.5	0.3	0.3	1.0
% <1.0	2.6	4.0	5.7	6.5	5.8	5.7	3.9	2.4	1.8	1.3	1.4	1.9	3.4
% ≥1.0	97.4	96.0	94.3	93.5	94.2	94.4	96.2	97.7	98.2	98.7	98.6	98.1	96.6

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

4th Quarter – FY23

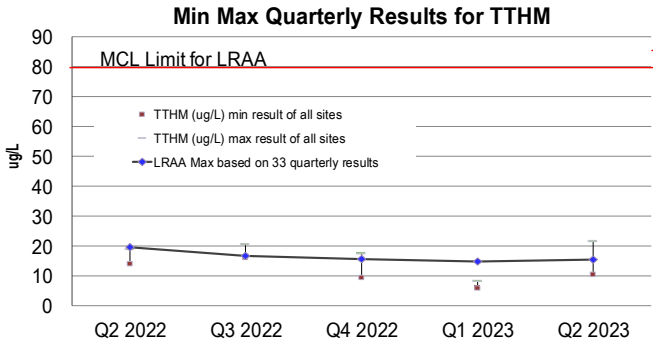
Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s) are by-products of disinfection treatment with chlorine. They are of concern due to their potential adverse health effects at high levels. EPA's locational running annual average (LRAA) standard, using the most recent four quarterly results, is 80 µg/L for TTHMs and 60 µg/L for HAA5s. The locational running annual average at each individual sampling location must be below the standard.

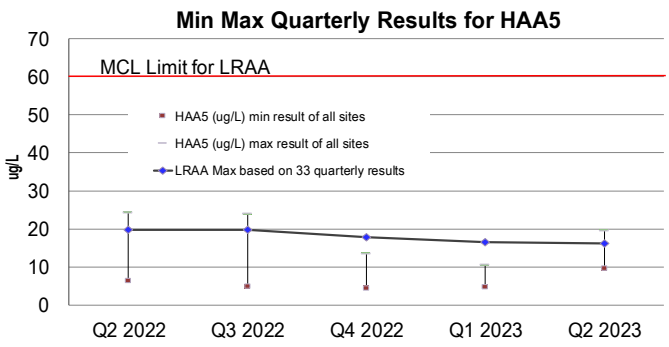
Bromate is tested monthly as required for water systems, like CWTP, that treat with ozone. EPA's RAA Maximum Contaminant Level (MCL) standard for bromate is 10 µg/L. The current RAA for Bromate at the CWTP finished water tap is 0.0 µg/L.

MWRA's TTHM and HAA5 sampling program includes sampling at 33 MetroWest and Metro Boston communities sites. Partially served and CVA communities are responsible for their own compliance monitoring and are regulated individually.

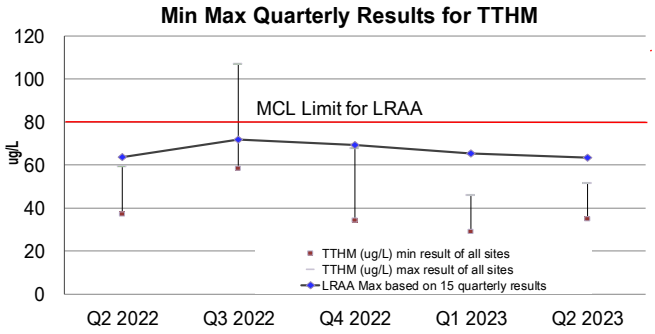
The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remains below current standards. The Max LRAA in the quarter for TTHMs = 15.5 µg/L; HAA5s = 16.3 µg/L. No LRAA exceedances or violations occurred this quarter for MetroBoston and for any of the CVA communities.

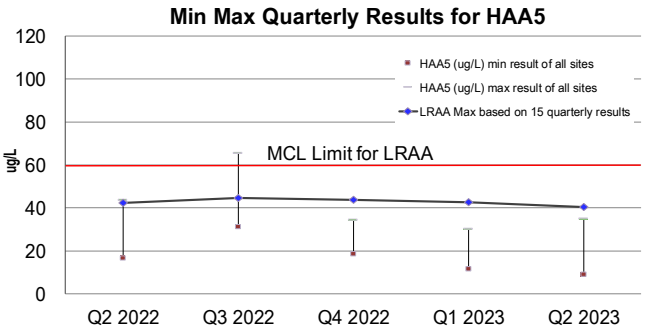
MetroBoston Disinfection By-Products





CVA Disinfection By-Products (Combined Results Chicopee, Wilbraham, & South Hadley FD1)





Water Supply and Source Water Management

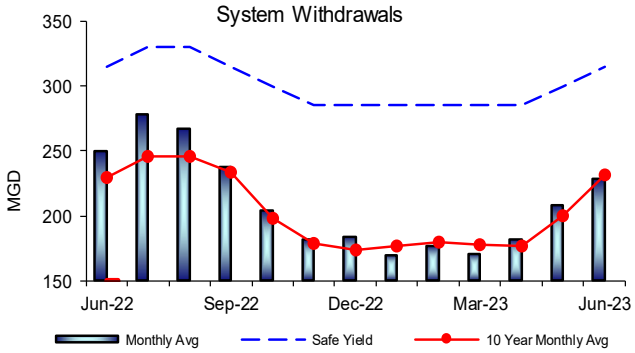
4th Quarter – FY23

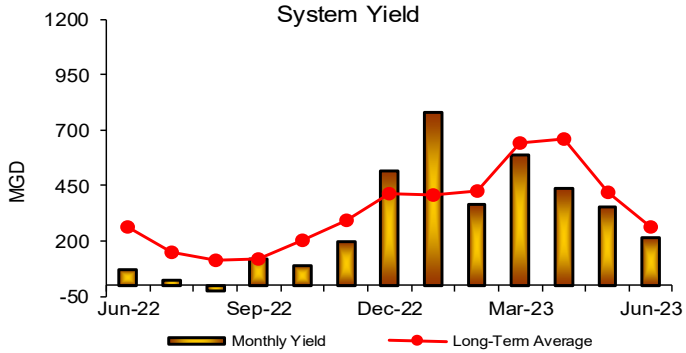
Background

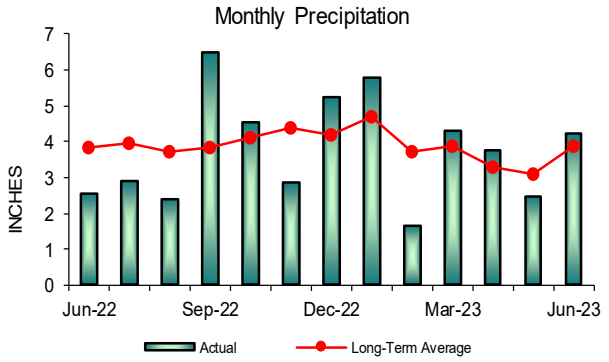
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir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

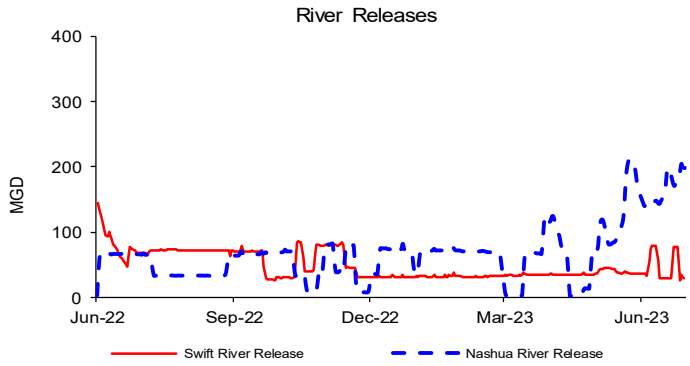
Outcome

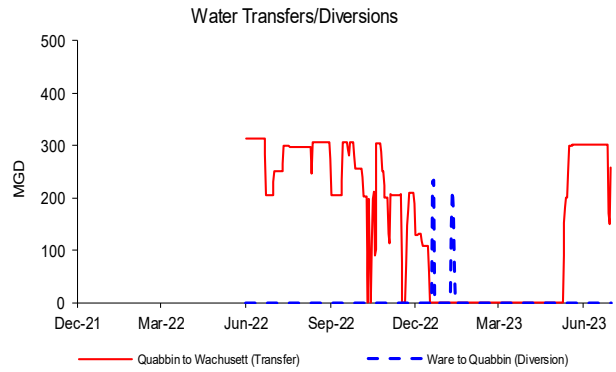
The volume of the Quabbin Reservoir was at 94.2% as of June 30, 2023; a 1.6 % increase for the quarter, which represents a gain of more than 6.7 billion gallons of storage and an increase in elevation of 0.90'. System withdrawal was below its long term quarterly average. Precipitation and Yield quarterly average were below their long term quarterly averages. Quabbin is in Normal Operating Range for this time of year.

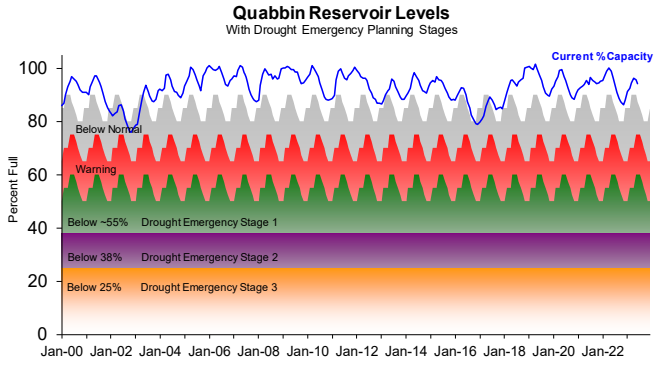












WASTEWATER QUALITY

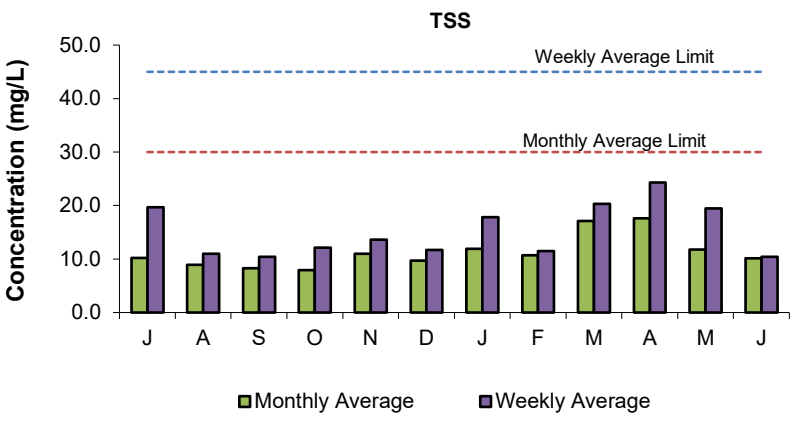
NPDES Permit Compliance: Deer Island Treatment Plant

4th Quarter - FY23

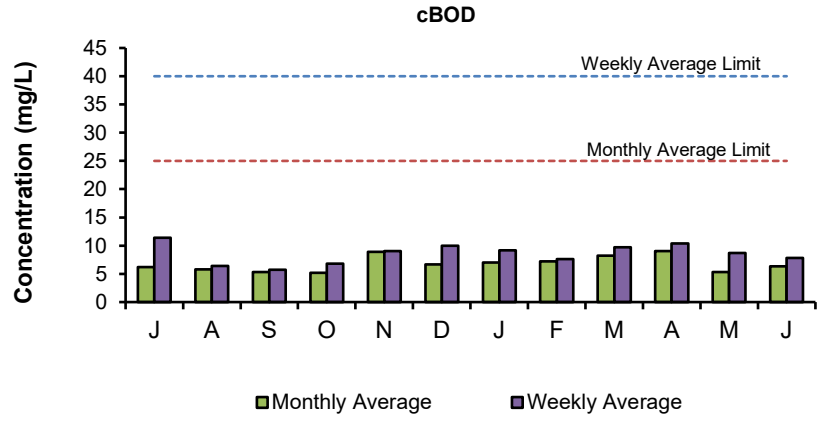
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*April*	*May*	*June*	*4th Quarter Violations*	*FY23 YTD Violations*
Dry Day Flow (365 Day Average):		mgd	436	250.4	254.5	257.7	0	0
cBOD:	Monthly Average	mg/L	25	9.0	5.3	6.3	0	0
	Weekly Average	mg/L	40	10.4	8.7	7.8	0	0
TSS:	Monthly Average	mg/L	30	17.6	11.8	10.1	0	0
	Weekly Average	mg/L	45	24.3	19.5	10.4	0	0
TCR:	Monthly Average	ug/L	456	0.0	0.0	0.0	0	0
	Daily Maximum	ug/L	631	0.0	0.0	0.0	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	9	11	22	0	0
	Weekly Geometric Mean	col/100mL	14000	9	6	7	0	0
	% of Samples >14000	%	10	0	0	0	0	0
	Consecutive Samples >14000	#	3	0	0	0	0	0
pH:		SU	6.0-9.0	6.5-6.8	6.4-6.9	6.5-6.9	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Inland Silverside	%	≥50	>100	>100	>100	0	0
	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Inland Silverside	%	≥1.5	50	50	50	0	0
	Sea Urchin	%	≥1.5	100	100	100	0	0

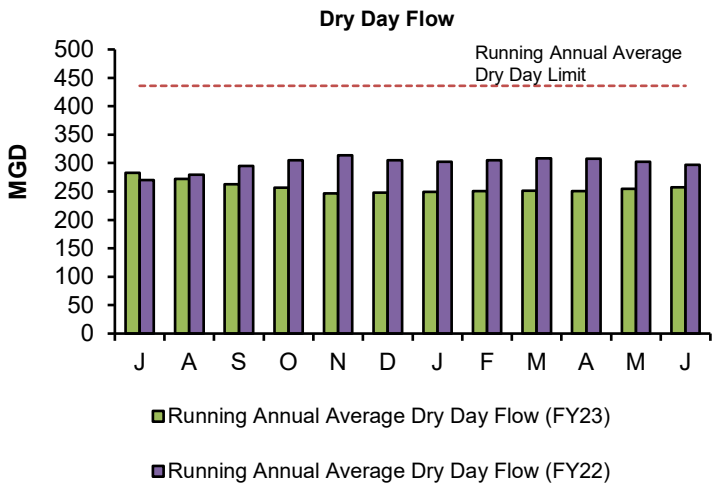
There have been no permit violations in FY23 to date at the Deer Island Treatment Plant (DITP).



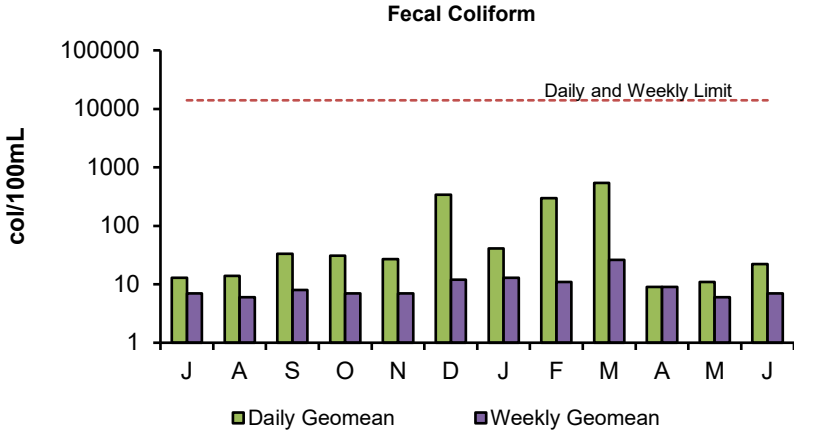
Total Suspended Solids (TSS) in the effluent is a measure of the amount of solids that remain suspended after treatment. All TSS measurements for the 4th Quarter were within permit limits.



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 4th 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 4th 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 4th Quarter, all permit conditions for fecal coliform were met.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant

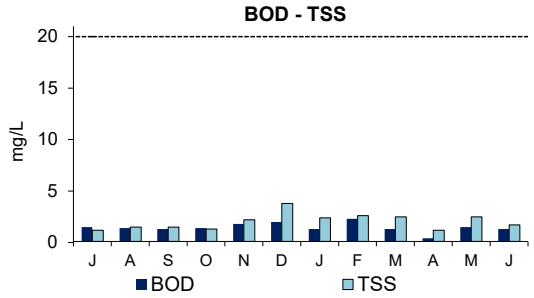
4th Quarter - FY23

NPDES Permit Limits

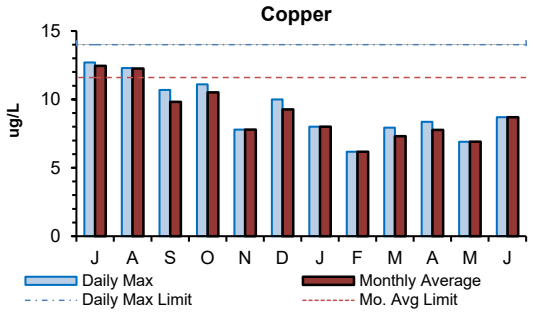
Effluent Characteristics		*Units*	*Limits*	*April*	*May*	*June*	*4th Quarter Violations*	*FY23 YTD Violations*
Flow:	12-month Rolling Average:	mgd	3.01	2.35	2.43	2.49	0	1
BOD:	Monthly Average:	mg/L	20	0.4	1.5	1.3	0	0
	Weekly Average:	mg/L	20	1.8	2.3	2.3	0	0
TSS:	Monthly Average:	mg/L	20	1.2	2.5	1.7	0	0
	Weekly Average:	mg/L	20	1.8	1.6	6.8	0	0
pH:		SU	6.5-8.3	7.4-7.8	6.5-7.6	7.3-7.7	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	9.5	9.3	7.8	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	5	5	6	0	0
	Daily Geometric Mean:	cfu/100mL	409	7	5	11	0	0
TCR:	Monthly Average:	ug/L	20	<20	<20	<20	0	0
	Daily Maximum:	ug/L	30.4	<20	<20	<20	0	0
Copper:	Monthly Average:	ug/L	11.6	7.77	6.91	8.70	0	2
	Daily Maximum:	ug/L	14.0	8.36	6.91	8.70	0	0
Total Ammonia Nitrogen:	Monthly Average:	mg/L	2.0	0.02	<0.1	<0.1	0	0
June 1st - October 31st	Daily Maximum:	mg/L	3.0	0.07	<0.1	<0.1	0	0
Total Phosphorus:	Monthly Average:	ug/L	0.15	0.04	0.04	0.08	0	0
April 1st - October 31st	Daily Maximum:	ug/L	RPT	0.1	0.1	0.2	0	0
Acute Toxicity+:	Daily Minimum:	%	≥100	>100	N/A	N/A	0	0
Chronic Toxicity+:	Daily Minimum:	%	≥62.5	100.0	N/A	N/A	0	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%.
2nd Quarter: There were no permit violations in the second quarter.
3rd Quarter: There were no permit violations in the third quarter.
4th Quarter: There were no permit violations in the fourth quarter.

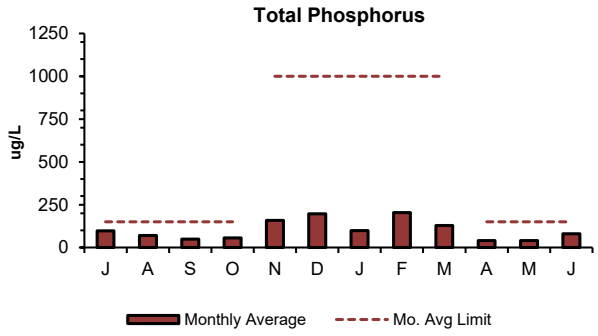
+ Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



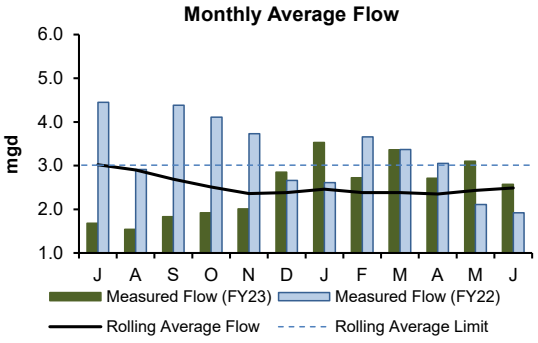
Monthly average concentrations of BOD and TSS were below permit limits in the 4th Quarter. The permit monthly limit for both parameters is 20 mg/L.



Daily maximum and monthly average concentrations of copper were below permit limits in the 4th Quarter. Permit daily and monthly limits are 14.0 ug/L and 11.6 ug/L 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.

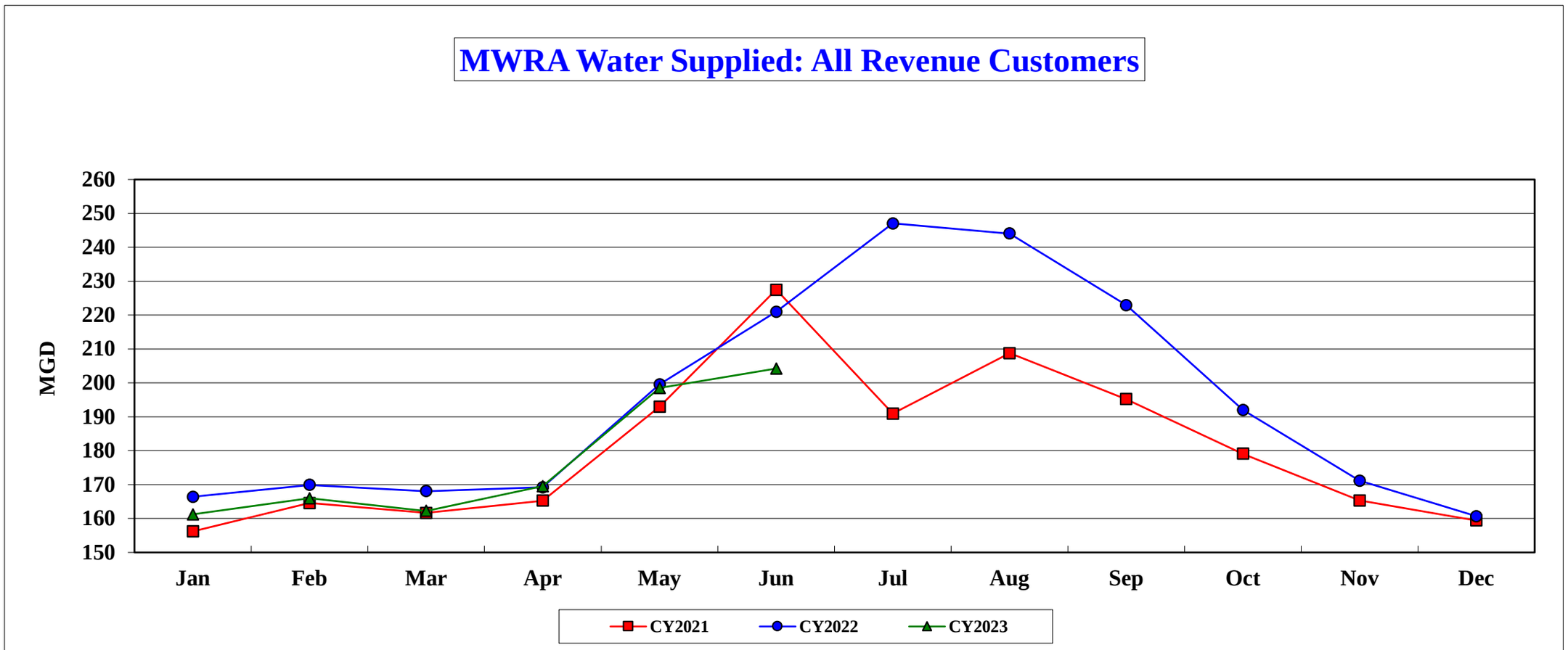


The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant.
The 12-month rolling average flows during the 4th Quarter were below the permit limit.

COMMUNITY FLOWS AND PROGRAMS

Customer Water Use

4th Quarter - FY23



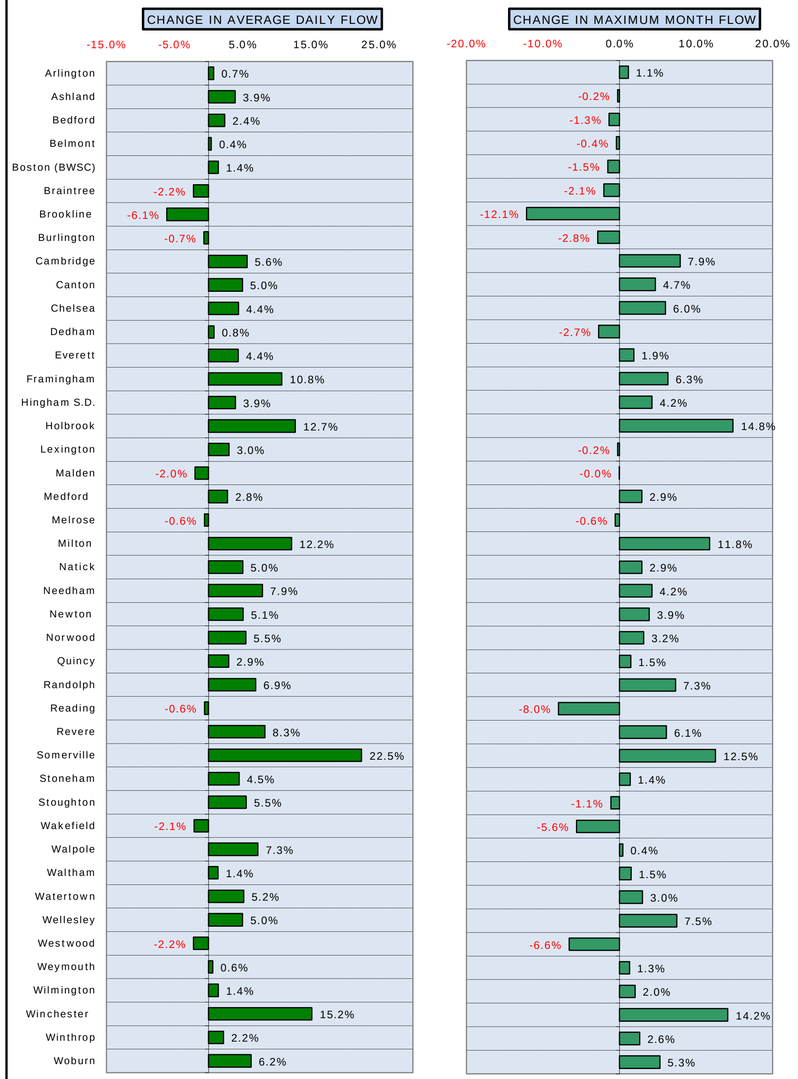
	Water Use (million gallons per day)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2021	156.213	164.567	161.697	165.284	192.998	227.522	190.945	208.810	195.229	179.116	165.302	159.442	178.067	180.641
CY2022	166.445	169.923	168.101	169.253	199.626	221.002	247.075	244.069	222.906	192.000	171.170	160.697	182.457	194.537
CY2023	161.248	165.963	162.266	169.566	198.489	204.245	-	-	-	-	-	-	177.035	177.035

The June 2023 Community Water Use Report was recently distributed to communities and customers served by the MWRA's 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 2023 water use will be used to allocate the FY2025 water utility rate revenue requirement.

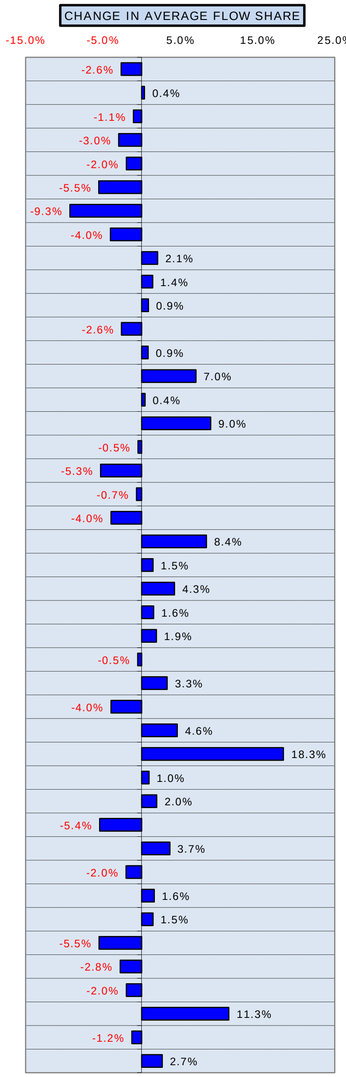
MWRA customers used an average of 196.7 mgd in the 4th quarter (Apr-Jun 2023) of FY2023. This is a decrease of 5.8 mgd or 3.0% compared to the 4th quarter of FY2022.

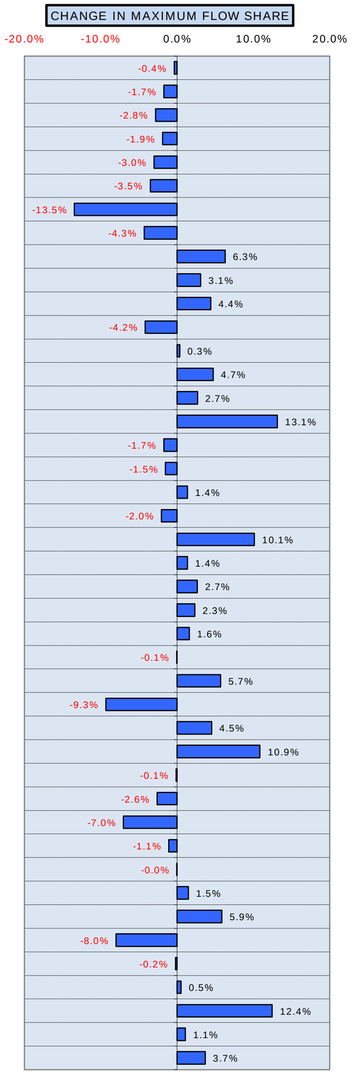
How CY2021-23 Community Wastewater Flows Could Effect FY2025 Sewer Assessments [1,2,3]

The flow components of FY2025 sewer assessments will be calculated using a 3-year average of CY2021 to CY2023 wastewater flows compared to FY2024 assessments that will use a 3-year average of CY2020 to CY2022 wastewater flows.

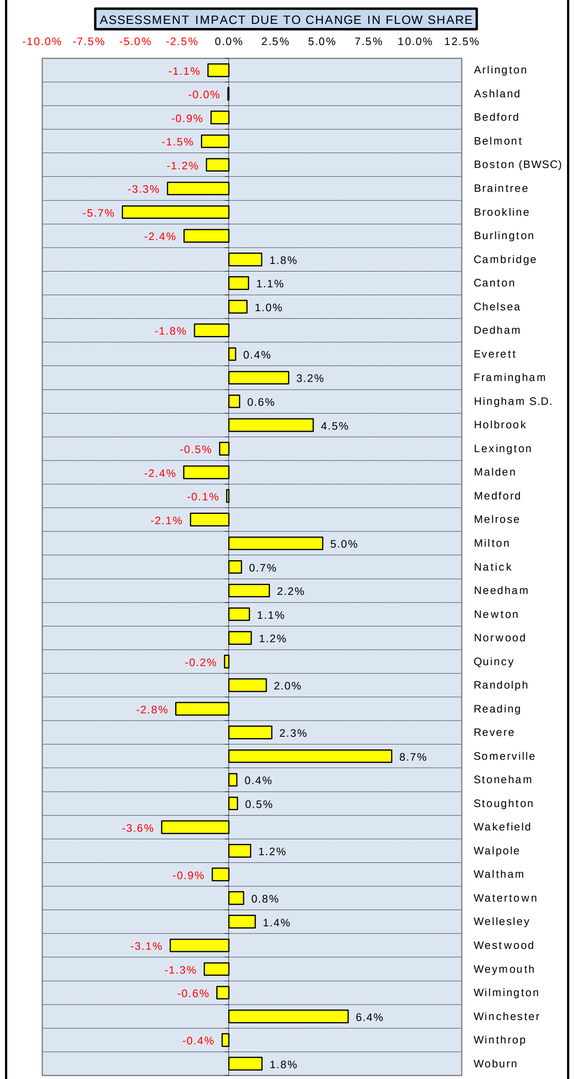


But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2021 to CY2023 flow share compared to CY2020 to CY2022 flow share, compared to all other communities in the system.





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.

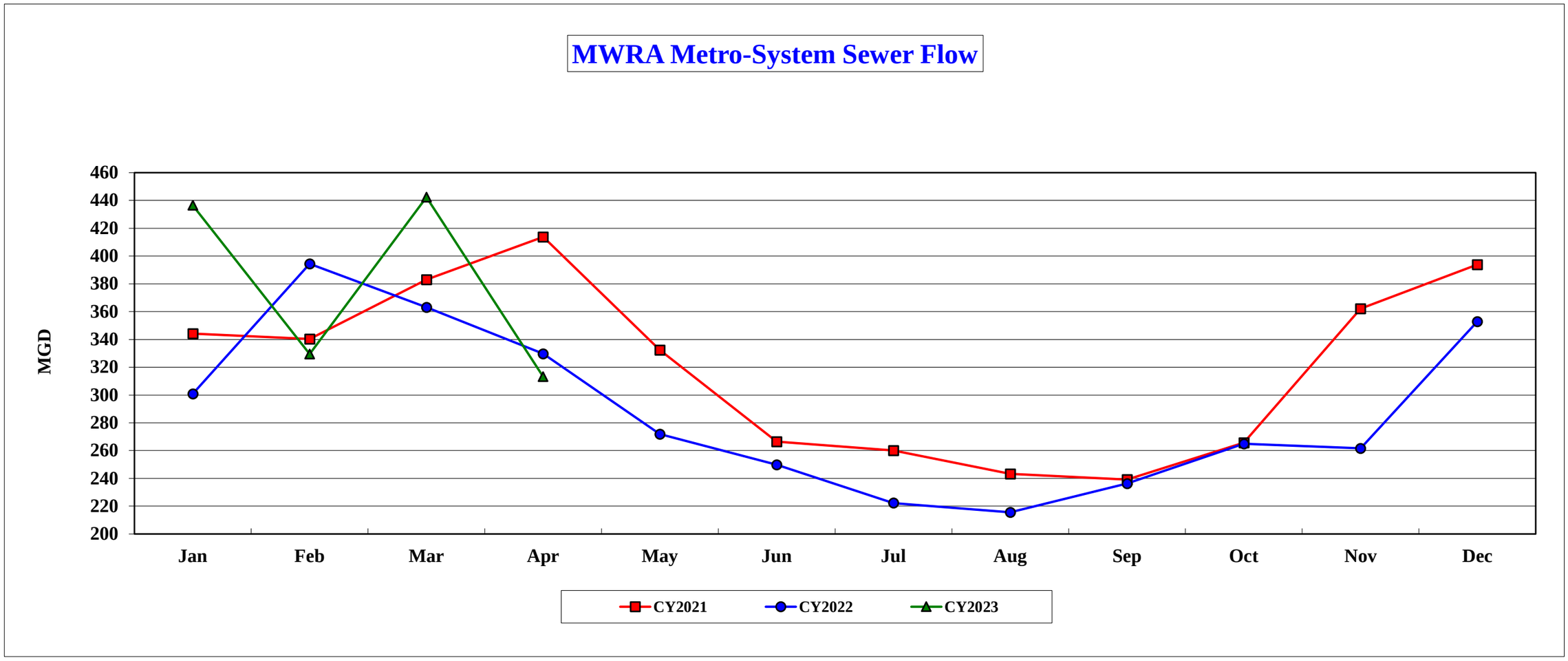
[2] Based on actual flows for 2022 and 2023 (through April), and January to March, and June to December 2020. April & May 2020 based on the average of 3 prior years, adjusted for 2020 water use. January to December 2021 estimated based on the average of the 3 prior years.

[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 Sewer Flow

YTD - FY23



	Sewer Flow (million gallons per day)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2021	344.203	340.320	383.107	413.769	332.385	266.443	260.030	243.310	239.147	265.670	362.143	393.833	370.739	320.199
CY2022	300.930	394.400	363.110	329.710	271.890	249.840	222.280	215.600	236.380	264.960	261.560	352.870	345.998	287.969
CY2023	436.480	329.510	442.340	313.210	-	-	-	-	-	-	-	-	382.217	308.729

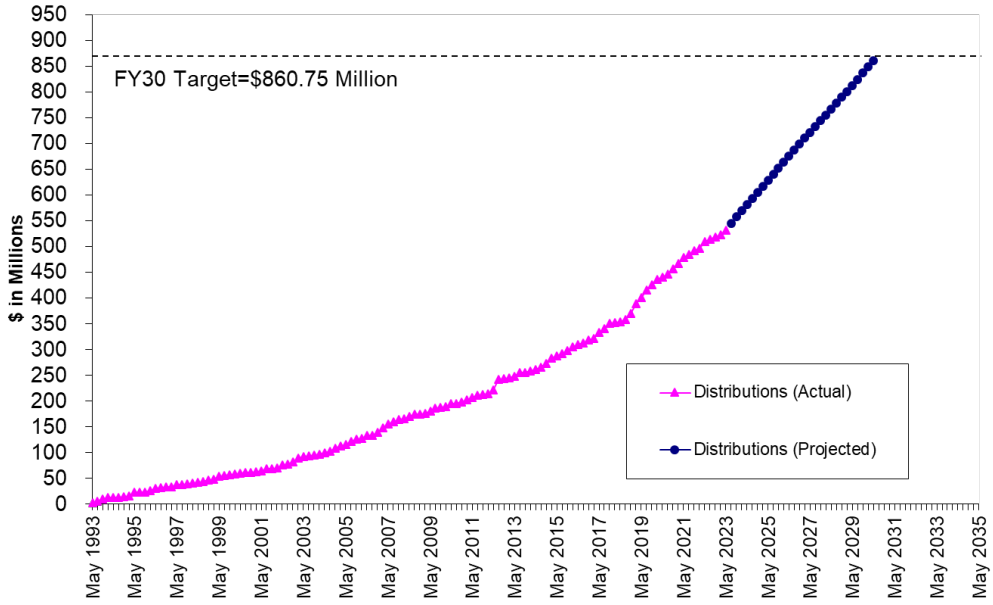
The 2023 4-Month Community Sewer Flow Report was recently distributed to the 43 communities served by the MWRA's Metropolitan sewer system. Each community's share of sewer flow relative to the system as a whole is used to allocate the annual sewer rate revenue requirement to MWRA sewer communities. The average of calendar year 2021-2023 sewer flow will be used to allocate the FY2025 sewer utility rate revenue requirement.

MWRA customer sewer flow averaged 382.2 mgd in the first four months of CY2023. This is an increase of 36.2 mgd or 10.5% compared to the first four months of CY2022.

Infiltration/Inflow Local Financial Assistance Program

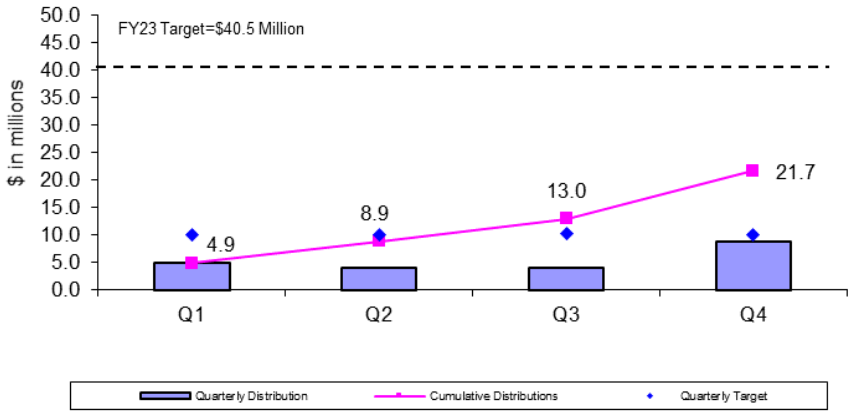
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides $860.75 million in grants and interest-free loans (average of about $22 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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 4th Quarter of FY23, $8.7 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Boston, Burlington, Melrose, Newton and Quincy. Total grant/loan distribution to date for FY23 is $22 million. From FY93 through 4th Quarter of FY23, all 43 member sewer communities have participated in the program and $532 million has been distributed to fund 664 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

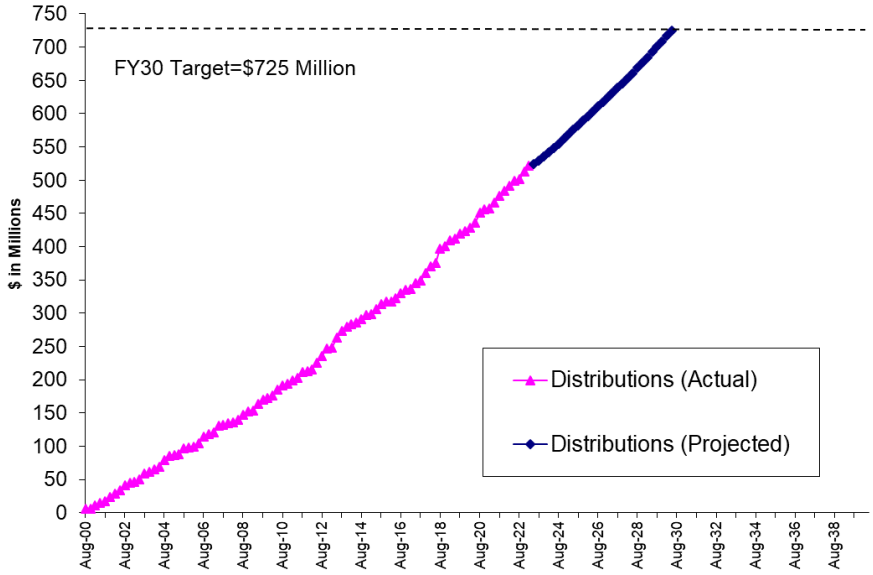


Community Support Programs
4th Quarter – FY23

Local Water System Assistance Program

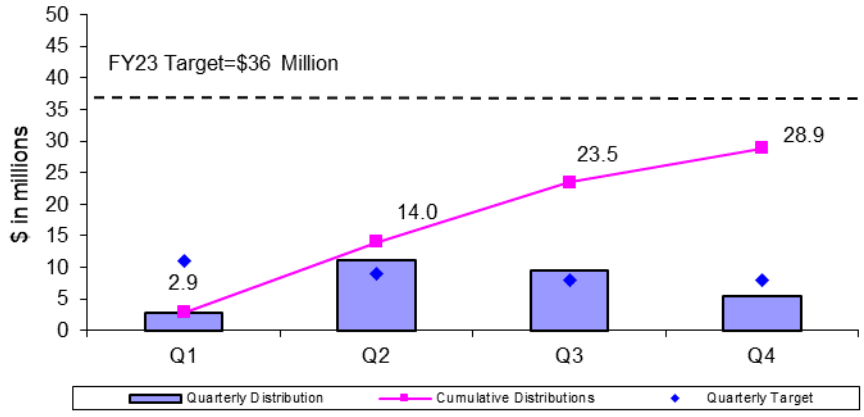
MWRA's Local Water System Assistance Programs (LWSAP) provides $725 million in interest-free loans (an average of about $24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have been three (3) funding 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 from FY18 through FY30.

Local Water System Assistance Program Distribution FY01-FY30



During the 4th Quarter of FY23, $5.4 million in interest-free loans was distributed to fund local water projects in Everett, Melrose, Newton, Nahant and Swampscott. Total loan distribution to date for FY23 is $28.9 million. From FY01 through the 4th Quarter of FY23, $527 million has been distributed to fund 519 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
4th 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. To date, $35.5 million dollars have been distributed to 14 communities.

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.

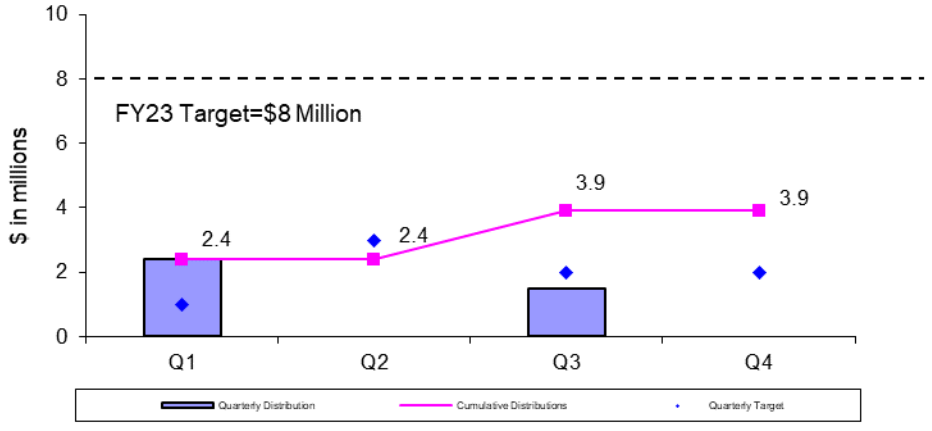
FY22 is the sixth year of the Lead Loan Program - MWRA made six Lead Loans.

FY23 is the seventh year in the Lead Loan Program - MWRA has made six Lead Loans.

Summary of Lead Loans:

Chelsea in FY23	$0.5 Million
Watertown in FY23	$0.3 Million
Winthrop in FY23	$0.7 Million
Reading in FY23	$1.5 Million
Watertown in FY23	$0.3 Million
Winchester in FY23	$0.6 Million
Everett in FY22	$1.5 Million
Boston in FY22	$0.9 Million
Winthrop in FY22	$0.8 Million
Somerville in FY22	$1.6 Million
Revere in FY22	$1.3 Million
Chelsea in FY22	$0.3 Million
Watertown in FY21	$0.6 Million
Marlborough in FY21	$2.0 Million
Everett in FY21	$1.5 Million
Boston in FY21	$2.6 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
Marlborough in FY19	$1.0 Million
Winthrop in FY19	$0.5 Million
Chelsea in FY19	$0.1 Million
Everett in FY19	$1.0 Million
Needham in FY18	$1.0 Million
Winchester in FY18	$0.5 Million
Revere in FY18	$0.2 Million
Winthrop in FY18	$0.3 Million
Marlborough in FY18	$1.0 Million
Newton in FY17	$4.0 Million
Quincy in FY17	$1.5 Million
Winchester in FY17	$0.5 Million
TOTAL	$35.5 Million

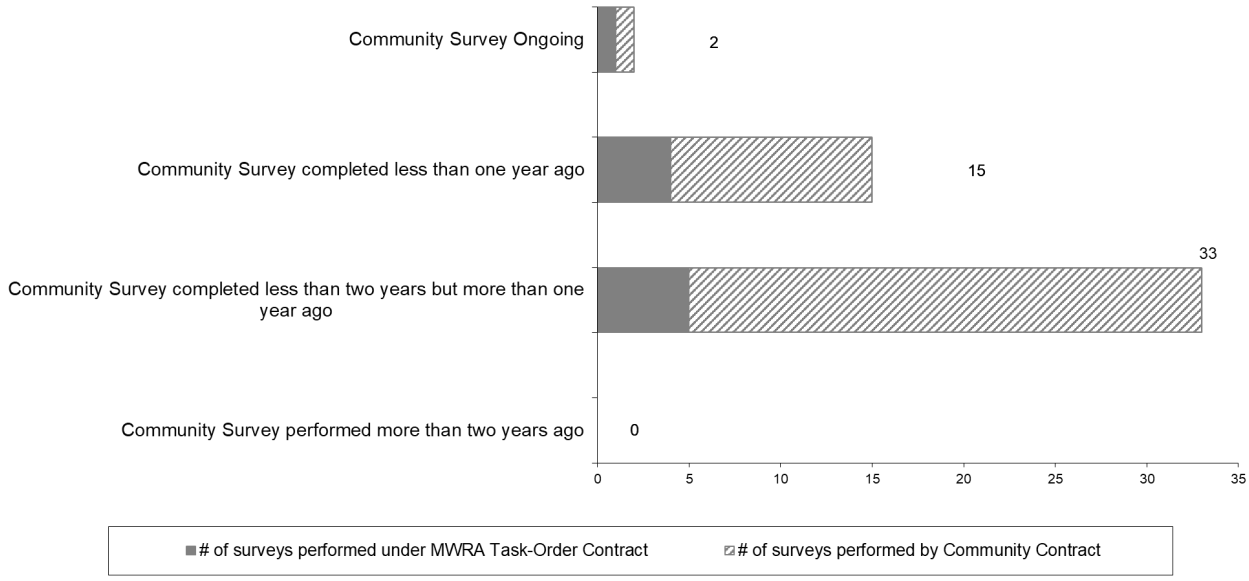
FY23 Quarterly Distributions of Lead Service Line Replacement Loans



Community Support Programs
4th 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 4th 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	17,985	418	15,304	7,462	41,169
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	2,302	62	467	586	3,417
Toilet Leak Detection Dye Tablets	_____	3,151	28	3,258	370	6,807

BUSINESS SERVICES

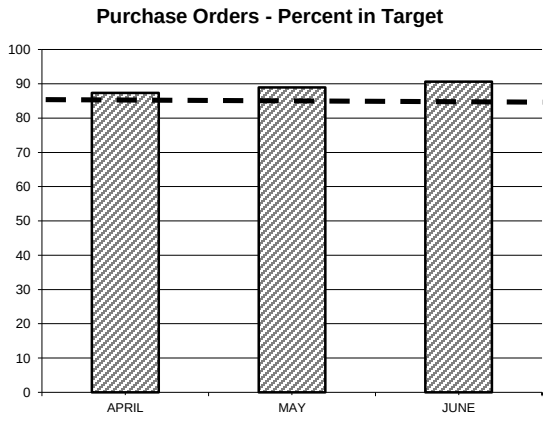
Procurement: Purchasing and Contracts

4th Quarter - FY23

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

Highlights: Processed 92% of purchase orders within target; Average Processing Time was 5.23 days vs. 5.39 days in Qtr 4 of FY22. Processed 100% (2 of 2) of contracts within target timeframes; Average Processing Time was 138 days vs. 98 days in Qtr 4 of FY22.

Purchasing



	No.	TARGET	PERCENT IN TARGET
$0 - $500	521	3 DAYS	82.5%
$500 - $2K	551	7 DAYS	94.5%
$2K - $5K	358	10 DAYS	96.9%
$5K - $10K	153	25 DAYS	99.3%
$10K - $25K	72	30 DAYS	93.0%
$25K - $50K	28	60 DAYS	100.0%
Over $50K	41	90 DAYS	95.1%

The Purchasing Unit processed 1,724 purchase orders, 43 more than the 1,657 processed in Qtr 4 of FY22 for a total value of $14,927,509 versus a dollar value of $15,684,353 in Qtr 4 of FY22.

The purchase order processing target was not met for the $0K - $500 category due to item sourcing and price confirmations.

Contracts, Change Orders and Amendments

Procurement executed two contracts with a value of $5,339,839 and three amendments with a value of $552,449.

Staff reviewed 50 proposed change orders and 23 draft change orders.
Twenty change orders were executed during the period. The dollar value of all non-credit change orders during Q4 FY23 was $1,911,085 and the value of credit change orders was ($175,414).

Note: A credit change order is a change order that results in a decrease in contract value.

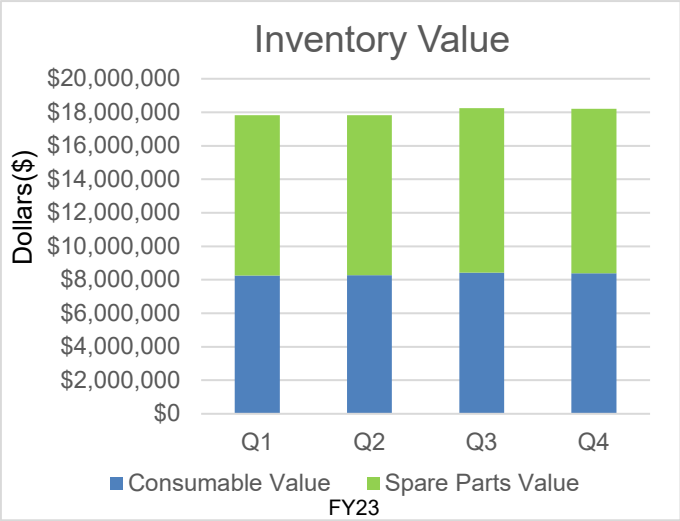
Materials Management

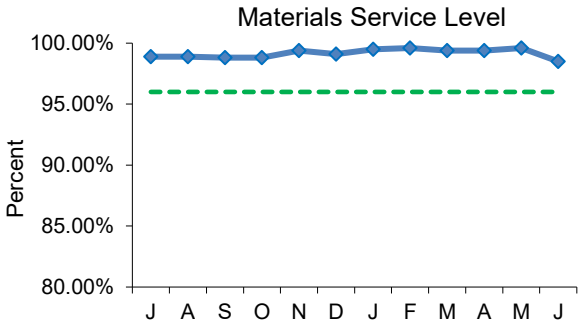
4th Quarter - FY23

The Materials Management department manages the three regional warehouses (Chelsea, Deer Island and Southboro). This includes the replenishment and receipt of both consumable and spare parts items to meet the needs of the MWRA. Additionally, MWRA tools and equipment are safeguarded through the Property Pass unit within the Materials Management department.

Inventory goals focus on:

- Maintaining optimum levels of consumables inventory (office supplies, electrical, safety, etc.) and spare parts inventory (critical items such as actuators, motors, muffin monsters, etc.) necessary to support MWRA Operations and Maintenance. Typically spare parts carry longer lead times.
- 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.

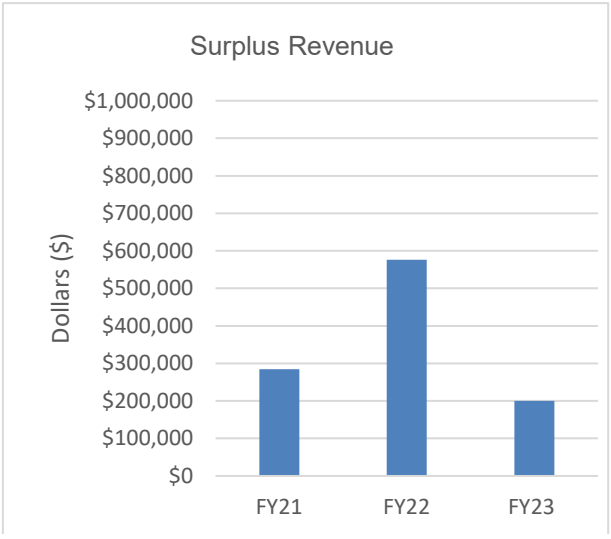


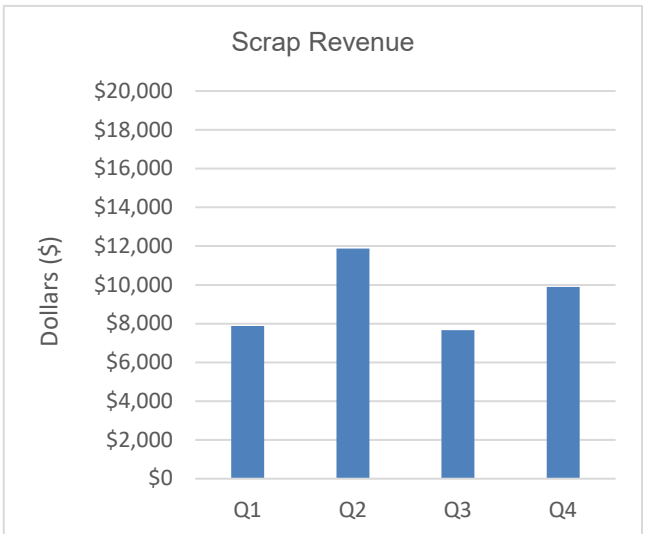


The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 2,714 (98.5%) of the 2,756 items requested in Q4 from the inventory locations for a total dollar value of $643,171.

Property Pass Program:

- Conducts audits of tools and equipment to ensure the safeguarding of MWRA assets.
- Manages the disposition and sale of surplus tools and equipment through GovDeals, an online auction site.
- Manages the surplusing of scrap metals and materials generating revenue to the MWRA staff.

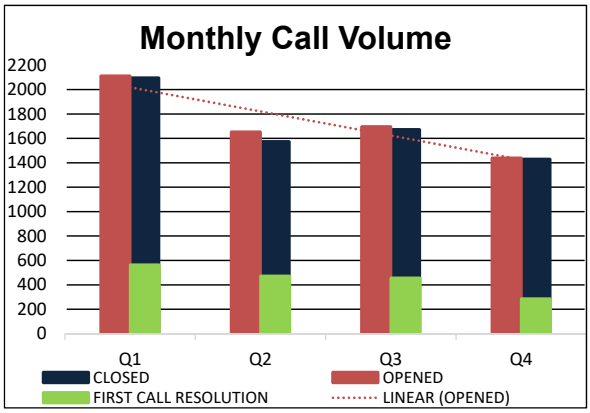




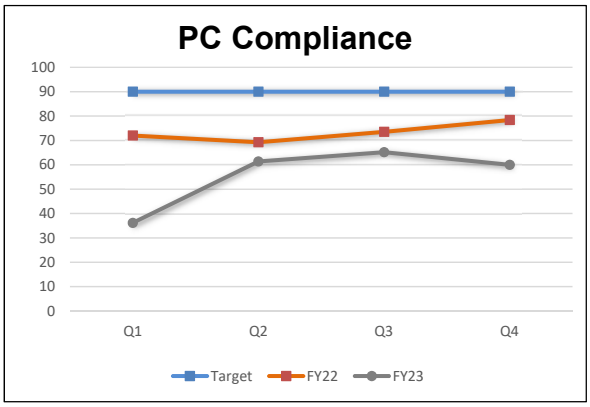
MIS Program

4th Quarter – FY23

Numbers & Statistics



Summary of calls managed by the Helpline. The trend line indicates the number of new tickets has decreased since peaking in Q1.



Percentage of user endpoints that are in compliance with system updates. These numbers are a direct reflection of accessibility to these systems. Daytime patching began in January for mobile devices.

Project Updates

Infrastructure & Security

Office Space Planning: All phases of the construction are completed with the exception of phase 2 in Deer Island, which is estimated to complete in July.

Network Enhancement/Upgrades: Tunnel Redundancy Core Storage facility brought online. Cellphone Distributed Antenna System upgraded in Chelsea, Deer Island installation to be scheduled. Edge switched replacement 60% completed, expected completion in October. Scope being developed for balance of copper cabling on DITP. Design of Software Defined Wide Area Network (SD-WAN) infrastructure to improve network resiliency completed. Phase 1 (Chelsea) implementation completed, remote sites to begin in July.
VMWare Workspace ONE: This solution will replace Citrix Workspace, XenMobile, Absolute, and Ivanti and will manage remote access, mobile devices, device tracking, software deployment, and asset management. MIS Desktop Team visited Chelsea, DI and Southborough to assist user's with migration on smartphones to the new email tool called Boxer, this effort is 82% complete

Conference Room Media Upgrades: Moving all conference rooms to new MWRA meeting standard. 8 of 16 conference rooms have been upgraded across the Authority. The remaining rooms are awaiting procurement of additional media kits.

Telephone System Upgrade: Phase 1 of phone system cutover completed on DITP. Next phase pending copper cabling upgrade.

Library, Record Center, & Training

Library: Undertook 20 research requests, supplied 28 books for circulation, provided 12 new books and 8 new standards (aside from subscription). Supported 450 end user searches, including: specifications for seawall repair, change orders for construction contracts-industry average, historic photos of wasm 3 construction, and gauging station images-Framingham.

Record Center (RC): 43 new boxes added to RC (1,052 YTD), handled 1,095 total boxes, and shredded 15, 65 gallon bins of confidential documentation this quarter. The scanning initiative continues with over 360 boxes of physical records since starting in Q1. Performed searches for various departments on topics such as seawall construction at Deer Island, historic photos of wasm 3 construction, Dudley Rd pump station, section 75 pipe laying, Deer Island wind turbine.

MIS Training: In Q4, 2 online IT lessons were taken by 78 employees (208 YTD).

Applications

ECM/Electronic Document Management: Made significant progress on Phase 2 of the project, which includes a large migration of electronic CAD drawings into a newly built Master Repository. Successfully migrated approximately 70% of DITP's approximately 10,000 drawings into the development environment. Started the development of two custom forms for RFI's and Submittals, and began preparations to begin User Acceptance Testing with E&C. Executed a change order to correct multiple data issues with the physical records data migration.

MWRA Website Refresh: Kick off meeting and initial requirements gathering meeting held. Worked with vendor to answer multiple technical questions from MIS and ENQUAL. Provided feedback on proposed site map. Demo of initial design to occur in early July.

Infor Upgrade/Migration: Received board approval, Notice to Proceed is expected in August.

Maximo/Lawson Interface: The contractor is finalizing development on the Maximo/Lawson interface touchpoints and staff are reviewing the documentation to be used for user acceptance testing. Production implementation is planned for late September.

Lawson: Implemented new Health Insurance and Flexible Spending Account (FSA) plans for the new plan year starting June 1st and July 1st respectively. Employees were transferred to the new plans based on their enrollment preferences. Worked with Payroll to complete salary chart setup, training and documentation for all new Union charts. Retroactive salary payments for Unit 2 employees has been created.

Discoverer to Business Objects Enterprise (BOE) Migration: Current Discoverer application that is used to create reports is being discontinued and being replaced with BOE. All required reports have been migrated to new application and are in the process of being verified. Training classes for MWRA staff are in development.

Telog Infrastructure Upgrade: Application upgrade to latest Telog Enterprise version 6.96 has been completed.

Maximo Version Upgrade: MIS continues with upgrade activities. The Development environment is complete and currently working to upgrade the Test environment with Production to follow.

Legal Matters
4th Quarter FY23

PROJECT ASSISTANCE

Real Estate, Contract, Energy, Environmental and Other Support:

- **8(m) Permits, License Agreements, and Other Permits:** Reviewed **82 eighty-two** 8(m) permits, including any related MEPA Section 61 findings. Reviewed and finalized a wastewater direct connection permit. Drafted four licenses.

- **Real Property**: Reviewed and authorized seven watershed real property acquisition projects by the Department of Conservation and Recreation. Revised form of license agreement for temporary use of land at various locations and drafted thirteen notices of offer for acquisition of permanent and temporary easements to support MWRA's Siphon Juncture Rehabilitation Project. Researched property rights for Metropolitan Water Tunnel Program and prepared license and access letters for survey and boring work to support the Program.

- **Energy:** Provided ongoing counsel and support for energy team and other MWRA divisions regarding energy related issues.

- **Environmental/NPDES:** Provided ongoing counsel and support to ENQUAL and other MWRA divisions regarding NPDES and other environmental related issues.

- **Miscellaneous:** Reviewed various proposed legislation for potential impacts to MWRA. Reviewed various construction contracts and prepared correspondence. Finalized MWRA policies for Information Technology, Security and Human Resources. Assisted operations with preparation of draft amendments to two water supply agreements. Assisted with preparation of a list of regulatory changes anticipated to be undertake/promulgated in the next twelve months, pursuant to the requirements of M.G.L. c. 30A. Researched applicable laws regarding removal of public shade trees, and finalized public tree hearing notice for MWRA Contract 6543 WASM 3. Assisted staff with resolution of certain construction claims and contract close out. Negotiated terms of license for software subscription service.

- **Public Records Requests:** MWRA received and responded to one hundred forty-nine public records requests. Provided counsel and support to various MWRA divisions and records access officers regarding the Public Records Law and Massachusetts Statewide Records Retention Schedule. Reviewed documents for submission to Records Conservation Board for disposition.

New Matters

- An employee filed a second charge of discrimination and retaliation against MWRA at the Massachusetts Commission Against Discrimination, based upon sex, gender identity and disability.

- A union filed a grievance and request for arbitration alleging MWRA violated the collective bargaining agreement when it failed to pay an employee 3.5 hours of compensatory time.

- A union filed a charge of prohibited practice at the Department of Labor Relations, alleging that MWRA violated the state labor relations law M.G.L. c. 150E, in connection with an arbitrator's decision concerning posting of a position at Grade 19 rather than Grade 21.

- A union filed a request for arbitration alleging that the MWRA unilaterally changed employees' compensatory time limits in violation of Article 6, Sections 1 and 2 of the Collective Bargaining Agreement.

- A union filed a request for arbitration, alleging that an employee was forced to violate an MWRA policy requiring accurate recording of time worked, was forced to keep track of his own overtime compensation and was not paid for overtime hours worked in violation of Article 6 of the Collective Bargaining Agreement.

- A union filed a request for arbitration, asserting that the MWRA forced an employee to use benefit time instead of allowing the accrual of overtime compensation, in violation of Article 6 of the Collective Bargaining Agreement.

- A union filed a request for arbitration asserting that MWRA forced employees to violate an alleged MWRA policy to accurately report time worked by having to keep track of their own overtime compensation, in violation of Article 6 of the Collective Bargaining Agreement. The union also alleged that, for the purpose of avoiding payment of overtime compensation, the MWRA forced employee to use benefit time instead of allowing the accrual of overtime compensation, in violation of Article 6 of the Collective Bargaining Agreement.

- A union filed a request for arbitration alleging that an employee was denied 3 hours of compensatory time on an unspecified date in violation of Article 6 of the Collective Bargaining Agreement.

- A union filed a request for arbitration asserting that an employee's leave balance does not accurately reflect compensatory time earned as a result of working 4 extra hours on 9/25/22.

- A union filed a request for arbitration, alleging that the MWRA violated the collective bargaining agreement when it suspended the Grievant.

Significant Developments

- The MWRA filed a complaint in the Chelsea District Court, appealing the decision of the Department of Unemployment Assistance's Board of Review affirming the Department's earlier decision granting unemployment benefits to a former employee. MWRA filed a Motion for Judgment on the Pleadings.

Matters Concluded

- Settled a grievance in which the union alleged that MWRA violated a collective bargaining agreement by unilaterally changing employees' compensatory time limits in violation of Article 6, Sections 1 and 2 of the Collective Bargaining Agreement. As a result of the settlement, the union withdrew its demand for arbitration.

- Settled a grievance in which the union alleged that an employee was forced to violate an MWRA policy requiring accurate recording of time worked, was forced to keep track of his own overtime compensation and was not paid for overtime hours worked in violation of Article 6 of the Collective Bargaining Agreement. As a result of the settlement, the union withdrew its demand for arbitration.

- Settled a grievance in which the union alleged that the MWRA forced an employee to use benefit time instead of allowing the accrual of overtime compensation, in violation of Article 6 of the Collective Bargaining Agreement.

- Settled a grievance in which the union alleged that the MWRA forced employees to violate an alleged MWRA policy to accurately report time worked by having to keep track of their own overtime compensation, and forced employee to use benefit time instead of allowing the accrual of overtime compensation to avoid payment of overtime compensation, in violation of Article 6 of the Collective Bargaining Agreement.

- Settled a grievance in which the union asserted that the MWRA denied an employee 3 hours of compensatory time on an unspecified date in violation of Article 6 of the Collective Bargaining Agreement. As a result of the settlement, the union withdrew its demand for arbitration.

- Settled a grievance in which the union asserted that the MWRA violated the Collective Bargaining Agreement because an employee's leave balance did not accurately reflect compensatory time earned as a result of working 4 extra hours on 9/25/22. As a result of the settlement, the union withdrew its demand for arbitration.

- Settled a grievance in which the union alleged that MWRA violated the collective bargaining agreement when it failed to pay an employee 3.5 hours of compensatory time. As a result of the settlement, the union withdrew its demand for arbitration.

LITIGATION/CLAIMS

New Lawsuits

Unified Contracting, Inc. v. MWRA, Suffolk Superior Court, 2384CV00927. This action, filed on April 18, 2023, arises out of MWRA Contract No. 7198, Quabbin Aqueduct Shaft 2 Repairs. The Plaintiff alleges it is entitled to payment for additional time and materials furnished for the project. The Plaintiff alleges damages of over $1.3 million.

MWRA v. Department of Unemployment Assistance and (Former Employee), Chelsea District Court, 2314CV180. Law Division filed a complaint for judicial review of a decision of the DUA allowing unemployment compensation.

New Claims:

There are no new claims to report.

Significant Developments:

Jon Eldridge, et al. v City of Framingham, MWRA and RJV Construction Corporation, Middlesex Superior Court, 2281CV03049. MWRA's Motion to Dismiss allowed by Court on May 5, 2023. Claims remain pending against other parties so final judgment for MWRA has not yet entered.

(Current employee) v. MWRA, et al., Suffolk Superior Court C.A. No. 284CV01434. Court allowed Joint Motion to Extend Tracking Order deadlines on May 26, 2023 to allow time for mediation. Assisted in the preparation of MWRA's submission in advance of mediation scheduled for July 11, 2023.

MWRA v. NAGE, Suffolk Superior Court CA No. 2284CV02453. MWRA served NAGE with a Motion for Judgment on the Pleadings.

Closed Lawsuits:

United States of America and Massachusetts Port Authority v. NSTAR Electric Company d/b/a Eversource ("Eversource"), Harbor Electric Energy Company ("HEEC") and Massachusetts Water Resources Authority, US District Court No. 1:16-cv-11470-RGS (Cross Harbor Cable Case): The Authority was a defendant, along with NSTAR Electric Company d/b/a Eversource ("Eversource") and Harbor Electric Energy Company ("HEEC"), in a civil action brought in July 2016 by the United States of America, at the request of the United States Army Corps of Engineers. The action sought injunctive relief and civil penalties and alleged violation of a permit issued to the defendants in September 1989 for the installation of a submarine cable that provides electric power to the Deer Island Treatment Plant. The federal action alleged that the power cable was not installed at required depths. The federal action was stayed by the District Court in 2017 as a result of an agreement between MWRA and HEEC pursuant to which HEEC was to undertake the design and installation of a suitable replacement power cable for MWRA's exclusive use (the "2017 Agreement"). Under the 2017 Agreement, the Authority is required to pay the cost of the project, subject to a $17.5 million credit for the early decommissioning of the old cable and a $9.0 million cap on MWRA's share of the cost of decommissioning the old cable. HEEC completed the installation and energizing of the replacement power cable and the old cable was removed. Eversource, HEEC and MWRA executed a Settlement Agreement & Release and on February 9, 2023, the parties filed a Stipulation of Dismissal of the federal action with prejudice. DPU Proceedings 17-136 and 21-147: The 2017 Agreement also provided that HEEC would propose a final tariff addendum to the Department of Public Utilities ("DPU") to incorporate the final project costs. In December 2021, the Authority and HEEC reached an agreement as to the terms of the final tariff addendum which included agreed project costs through August 31, 2021 of $116.5 million (representing 98% completion of the project) and provisions to permit HEEC to supplement the final tariff addendum to request recovery of certain remaining project costs to bring the project to final completion. On December 14, 2021, the DPU approved the final tariff addendum. At the time of the filing of the final tariff addendum HEEC was near, but not fully complete with the cable project. Applying the $9.0 million decommissioning cap, HEEC has estimated total project costs to the Authority of approximately $120 million. Any additional project costs incurred by HEEC are subject to review and audit by the Authority, and submission to the DPU for approval to supplement the final tariff addendum.

Re: Seaport Diagnostics Inc. (including its affiliate Telemere Diagnostic), Commencement of Creditors Trust. On February 1, 2023, a Notice of Commencement of Creditor's Trust was received on behalf of Seaport Diagnostics,

Inc., and its affiliate Telomere Diagnostic (f/k/n Orig3n). The Authority filed no claim as the TRAC permit issued to Orig3n was revoked as of September 30, 2022.

Citibank (South Dakota), N.A. v. (Current Employee)
This wage garnishment matter is closed.

Closed Claims:

Edgar Marques. This personal injury claim arose out of motor vehicle accident involving MWRA employee. The claim settled for $50,000. This claim is now closed.

Subpoenas:

There are no new subpoenas received and no subpoenas that closed in 4th Quarter FY 2023.

Wage Garnishments

There is one wage garnishment matter that is active and monitored by Law Division.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of June 2023
Construction/Contract/Bid Protest	1
Tort/Labor/Employment	4
Environmental/Regulatory/Other	1
Eminent Domain/Real Estate	0
TOTAL	**6**
Other Litigation matters (restraining orders, etc.) - Class Action suit	1
TOTAL – all pending lawsuits	**7**
Claims not in suit	2
Bankruptcy	2
Wage Garnishment	1
TRAC/Adjudicatory Appeals	3
Subpoenas	0
TOTAL – ALL LITIGATION MATTERS	**15**

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
4th Quarter - FY23

Internal Audit evaluates the effectiveness of internal controls and procedures and monitors the quality, efficiency and integrity of the Authority's operating and capital programs. Through our audits and reviews, we assess whether internal controls are functioning as intended and that only reasonable, allowable and allocable costs are paid to consultants, contractors and vendors.

Highlights

During the 4th quarter FY23, Internal Audit (IA) completed a fleet physical inventory of all plated vehicles and equipment in coordination with management. An audit of Accounts Payable Process controls and procedures and the Payroll Process controls and procedures is progressing. An internal review of MIS assets is progressing.

In addition, IA completed a true-up of 2022 operating expenses for the HEEC cable, reviewed the Fore River Railroad 2022 tax return, and completed 2 labor burden reviews. There are 4 preliminary reviews of professional service contracts, 4 incurred cost audits and 3 labor burden reviews in process. IA also issued 48 indirect cost rate letters to consultants following a review of their consultant disclosure statements.

Status of Recommendations

During FY23, 5 recommendations were closed.

IA follows-up on open recommendations on a continuous basis. All open recommendations have target dates for implementation and are generally targeted to be closed within 12 months of the audit report issue date.

Report Title (issue date)	Audit Recommendations		
	Open	Closed	Total
Fleet Services Non-Plated Equipment Inspections (3/30/20)	1	14	15
Compliance Status of Employees' Mandatory Confined Space Entry Training (2/24/23)	1	3	4
Water and Wastewater Licenses and Certifications (3/31/23)	2	*1*	*3*
Total Recommendations	*4*	*18*	*22*

Cost Savings

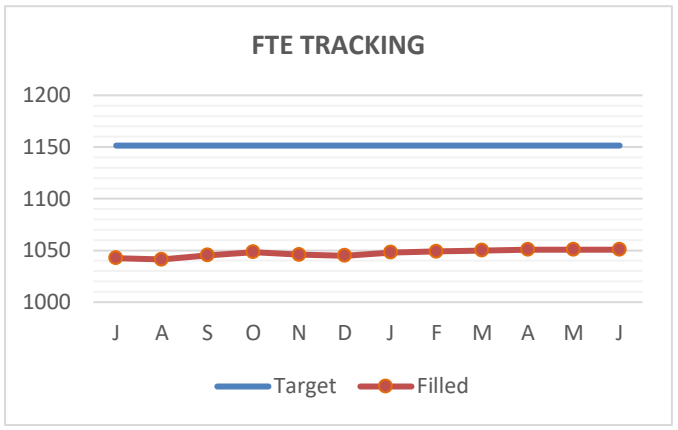
IA's target is to achieve at least $1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

Cost Savings	FY19	FY20	FY21	FY22	FY23	TOTALS
Consultants	$262,384	$643,845	$563,525	$39,938	$223,609	$1,733,301
Contractors & Vendors	$3,152,884	$2,097,729	$1,547,223	$1,714,614	$1,912,548	$10,424,998
Internal Audits	$210,063	$212,517	$214,458	$222,554	$225,684	$1,085,276
Total	**$3,625,331**	**$2,954,091**	**$2,325,206**	**$1,977,106**	**$2,361,841**	**$13,243,575**

OTHER MANAGEMENT

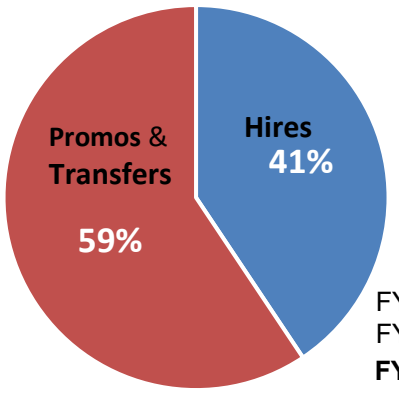
Workforce Management

4th Quarter - FY23



FY23 Budget for FTEs = 1151.4
FTEs as of June 2023= 1050.7
Tunnel Redundancy as of June 2023 = 9

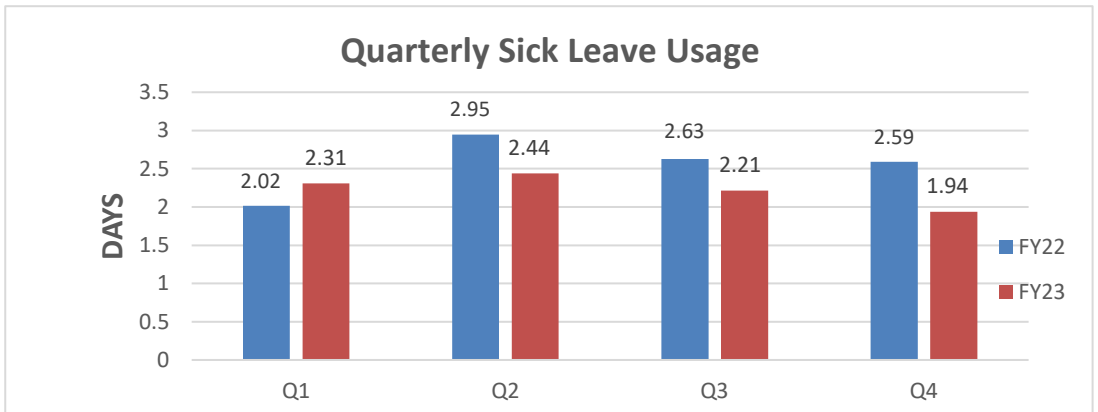
Position Filled by Hires/Promos & Transfer for YTD



	Pr/Trns	Hires	Total
FY21	81 (56%)	64 (44%)	145
FY22	138 (68%)	65 (32%)	203
FY23	133 (59%)	91(41%)	224

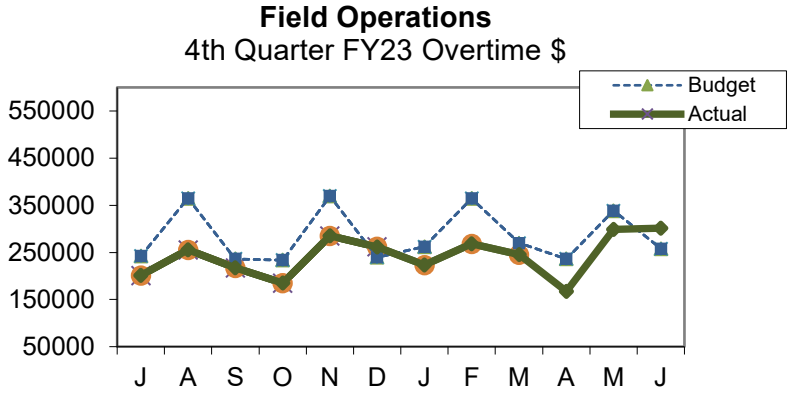
POSITION CHANGE by FY

FY	HIRES	PROMOS	TRANSFER	RETIRE	RESIGN	DISMISS	DECEASED
FY19	76	87	25	40	32	9	4
FY20	58	70	14	38	23	2	1
FY21	64	66	15	58	15	2	2
FY22	65	108	30	82	45	2	3
FY23	91	118	15	46	31	5	5



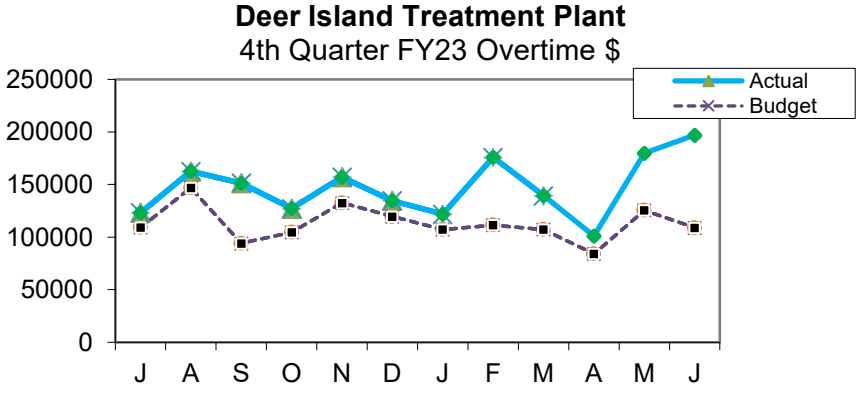
Average quarterly sick leave for the 4th Quarter of FY23 has decreased as compared to the 4th Quarter of FY22. (1.94 from 2.59).

Field Operations
4th Quarter FY23 Overtime $



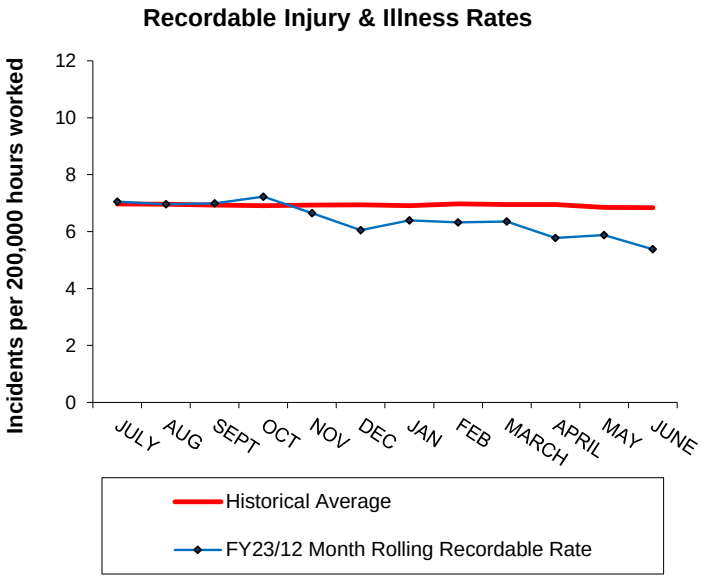
Total Overtime for Field Operations for fourth quarter was $768k, which is $64k or 8% under budget. Emergency overtime was $244k, which is $175k under budget or 42%, primarily due to fewer wet weather events. Coverage overtime totaling $222k which is $85k over budget or 48%, primarily due to vacant shifts going unfilled. Planned overtime was $238k or $14k or 6% over budget, with a combination spending of $46k for scheduled maintenance; and $126k for various coverage shifts.

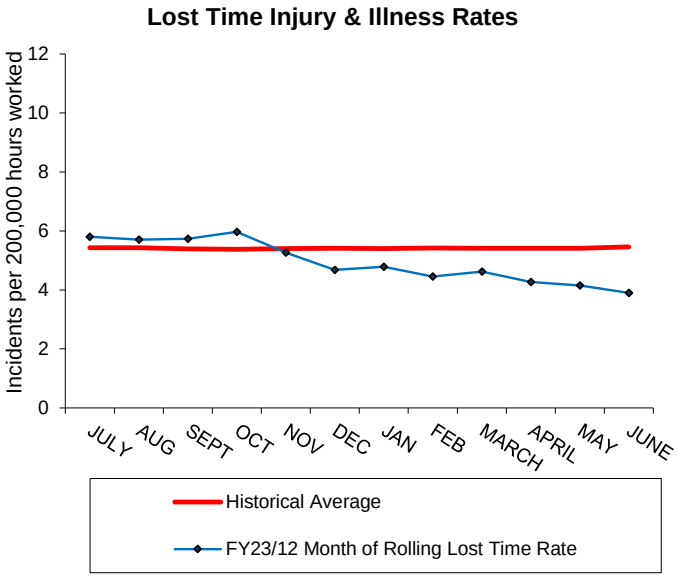
Deer Island Treatment Plant
4th Quarter FY23 Overtime $



Deer Island's total overtime expenditure fourth quarter was $478K, which is $159K or 50.0% over budget due to higher than anticipated shift coverage of $145K and planned/unplanned overtime of $49K. This is offset by lower spending for storm coverage of ($34K). YTD Deer Island's overtime spending is $922K, which is $420K or 31.0% over budget due to higher than anticipated shift coverage of $524K and planned/unplanned overtime of $48K. This is offset by lower than anticipated storm coverage of $152k.

Workplace Safety
4th Quarter - FY23





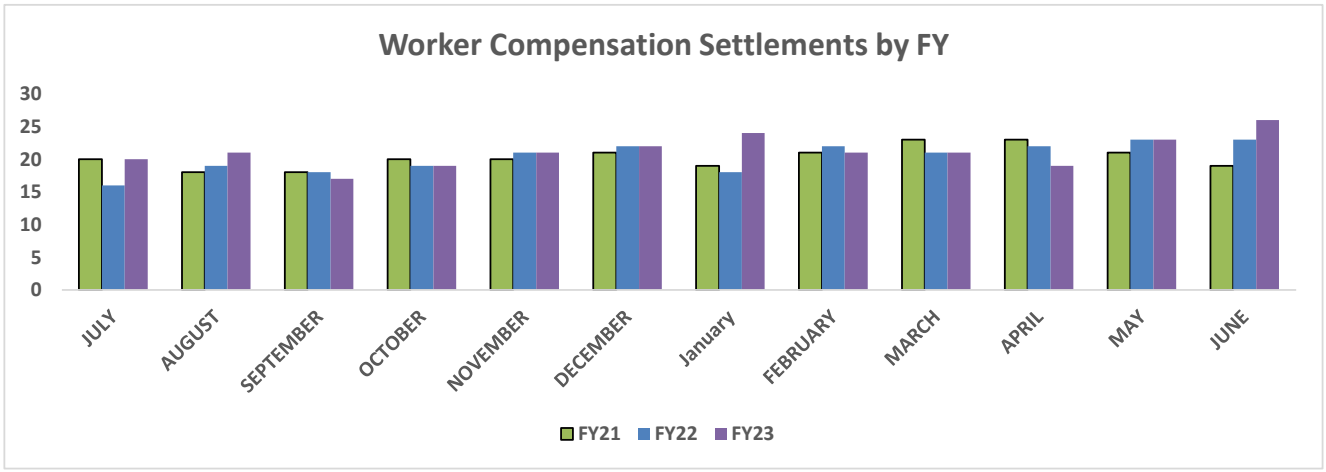
1 “Recordable" incidents are all work-related injuries and illnesses which result in death, loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid. Each month this rate is calculated using the previous 12 months of injury data.

2 "Lost-time" incidents, a subset of the recordable incidents, are only those incidents resulting in any days away from work, days of restricted work activity or both - beyond the first day of injury or onset of illness. Each month this rate is calculated using the previous 12 months of injury data.

3 The “Historical Average” is computed using the actual MWRA monthly incident rates for FY99 through FY22.

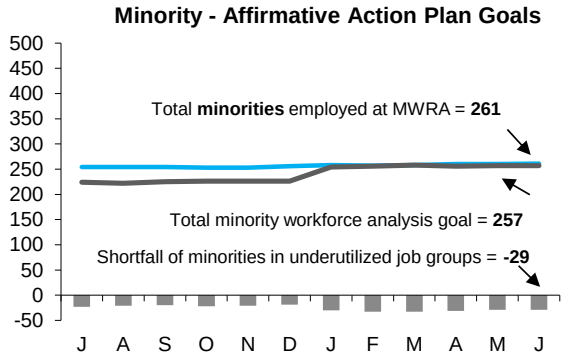
WORKERS COMPENSATION HIGHLIGHTS

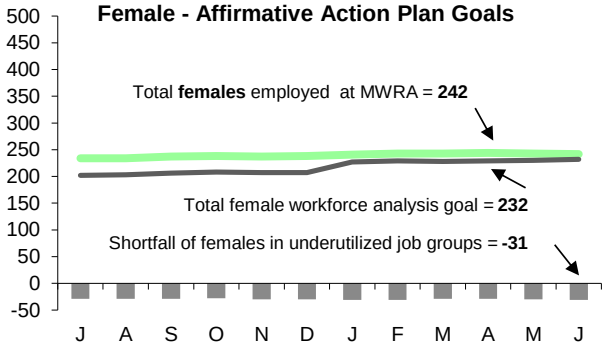
	4th Quarter Information		
	New	Closed	Open Claims
Lost Time	3	14	35
Medical Only	12	13	111
Report Only	15	17	
	QYTD		FYTD
Regular Duty Returns	7		19
Light Duty Returns	0		2
Indemnity payments as of June 2023 included in open claims listed			26



MWRA Job Group Representation

4th Quarter - FY23





Highlights:

At the end of Q4 FY23, 6 job groups or a total of 29 positions are underutilized by minorities as compared to 5 job groups for a total of 21 positions at the end of Q4 FY22; for females 8 job groups or a total of 31 positions are underutilized by females as compared to 8 job groups or a total of 30 positions at the end of Q4 FY22. During Q4, 7 minorities and 5 females were hired. During this same period 3 minorities and 4 females were terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 6/30/2023	Minorities as of 6/30/2023	Achievement Level	Minority Over or Underutilized	Females As of 6/30/2023	Achievement Level	Female Over or Underutilized
Administrator A	26	4	2	2	11	6	5
Administrator B	24	2	5	-3	6	7	-1
Clerical A	24	8	5	3	20	18	2
Clerical B	23	7	6	1	3	12	-9
Engineer A	80	18	21	-3	22	21	1
Engineer B	55	19	16	3	14	13	1
Craft A	110	17	25	-8	0	6	-6
Craft B	122	26	26	0	1	5	-4
Laborer	57	15	16	-1	3	3	0
Management A	90	20	22	-2	33	25	8
Management B	39	11	11	0	6	9	-3
Operator A	64	4	16	-12	3	7	-4
Operator B	58	18	9	9	3	2	1
Professional A	30	8	8	0	16	14	2
Professional B	155	47	45	2	70	50	20
Para Professional	48	17	11	6	24	23	1
Technical A	54	17	12	5	7	10	-3
Technical B	5	3	1	2	0	1	-1
Total	**1064**	**261**	**257**	**33/-29**	**242**	**232**	**41/-31**

AACU Candidate Referrals for Underutilized Positions

Job Group	Job Title	# of Vacancies	Requisition Internal/ External	Promotions/ Transfers	AACU Referral External	Position Status New Hire/Promotion
Administrative B	Asst Director, Internal Audit	1	Int.	1	0	PROMO = AM
Administrative B	Deputy Dir, Procurement	1	Int.	1	1	PROMO = AF
Craft B	Inventory Control Specialist	1	Int.	1	0	PROMO = HM
Engineer A	Sr Program Manager	1	Int.	1	0	PROMO = WM
Engineer A	Manager, Western Maintenance	1	Int./Ext.	1	0	PROMO = WM
Engineer A	Principal Civil Engineer	1	Int.	1	0	PROMO = WM
Engineer A	Project Engineer CADD - DISC	1	Ext.	0	0	NH = WM
Craft A	Unit Supervisor - Mech Cert	1	Int.	1	0	PROMO = WM
Craft A	M & O Specialist	1	Ext.	0	0	NH= WM
Craft B	Instrument Technician	1	Int./Ext.	1	0	PROMO = BM
Craft B	Med Volt Electrical Specialist	1	Int.	1	0	PROMO = WM
Craft B	Toolmaker	1	Int.	1	0	PROMO = WM
Craft B	Construction Pipelayer	1	Int.	1	0	PROMO = HM
Craft B	Electrician	1	Ext.	0	0	NH = WM
Laborer	OMC Laborer	2	Ext.	0	0	NH=1WM, 1BM
Laborer	Supervisor, Equipment Maint	1	Int.	1	0	PROMO= WM
Laborer	Building/Grounds Worker	2	Int./Ext.	1	0	PROMO=BM, NH=TM
Management A	Construction Coordinator	1	Ext.	0	0	NH = WM
Management B	Assistant Contracts Manager	1	Ext.	0	0	NH = WM
Technical A	Transmission & Treatment Opera	1	Int.	1	0	PROMO = WF
Technical A	Field Sup WW Pipe Inspection	49 2	Int.	2	0	PROMO = 2WM

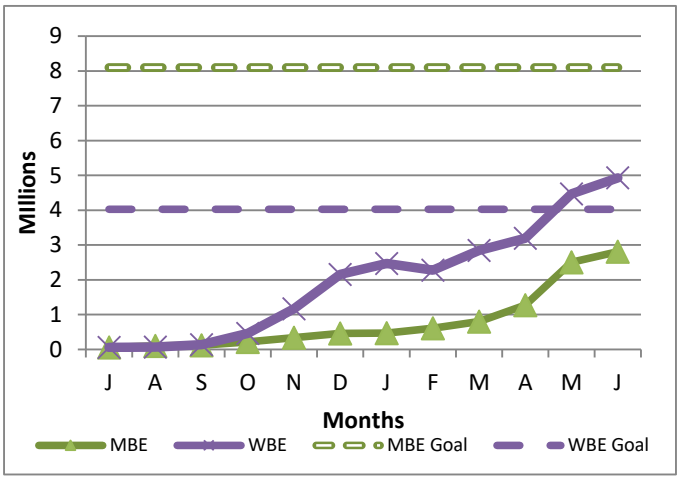
MBE/WBE Expenditures

4th Quarter - FY23

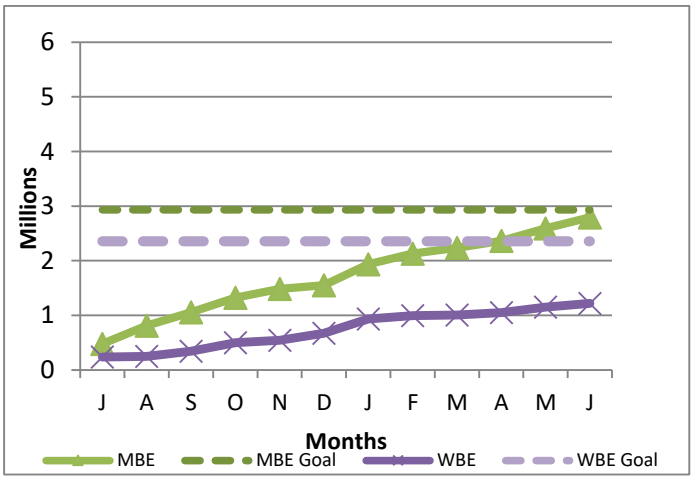
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The spending goals for FY23 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects that do not meet the established monetary thresholds and/or have limited opportunities for subcontracting have been excluded from the goals as they have no MBE/WBE spending goals. The spending goals for FY23 for Goods and Services are based on the average spending of MBE/WBE dollars for the previous 5 years.

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 June.

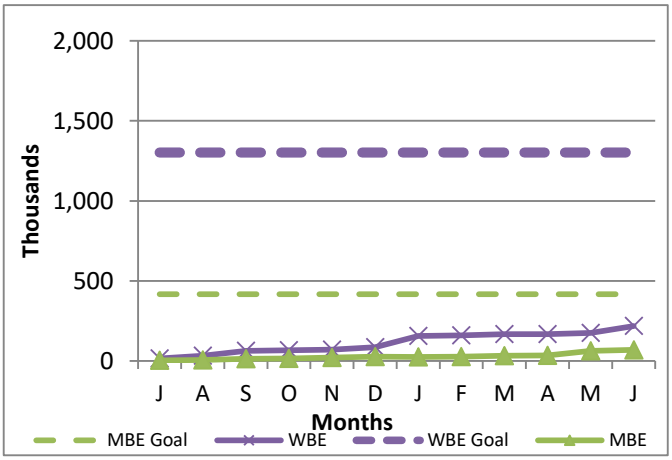
Construction



Professional Services



Goods/Services



FY23 spending and percentage of goals achieved, as well as FY22 performance are as follows:

MBE					WBE			
FY23 YTD		FY22			FY23 YTD		FY22	
Amount	Percent	Amount	Percent		Amount	Percent	Amount	Percent
2,808,124	34.7%	3,102,188	56.2%	Construction	4,927,964	95.3%	1,276,049	46.5%
2,794,126	95.3%	3,156,867	147.1%	Prof Svcs	1,220,172	51.8%	1,737,850	100.8%
69,250	16.6%	387,120	102.7%	Goods/Svcs	174,521	13.4%	365,393	27.6%
5,671,500	49.6%	6,646,175	82.6%	**Totals**	6,322,657	82.3%	3,379,292	58.3%

FY23 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

MWRA FY23 CEB Expenses through 4th Quarter 2023

As of June 2023, total expenses are $823.2 million, $17.0 million or 2.0% lower than budget, and total revenue is $864.7 million, $24.5 million or 2.8% over the estimate, for a net variance of $41.5 million.

Expenses –

Direct Expenses are $261.3 million, $12.4 million or 4.5% under budget.

- **Wages & Salaries** are $12.5 million under budget or 10.5%. Regular pay is $12.9 million under budget, due to lower head count, and timing of backfilling positions. YTD through June, the average Full Time Equivalent (FTE) positions was 1,057, 110 below the 1,167 FTE's budgeted.
- **Chemicals** are $3.0 million over budget or 20.3% due to higher spending for Sodium Hypochlorite of $1.8 million over budget due to greater usage at DITP due to lower flows and greater need for odor control and higher contract price and Wastewater Operations, primarily at the Nut Island Headworks. In addition, spending for Ferric Chloride and Carbon Dioxide were over budget by $1.0 million and $227k, respectively.
- **Utilities** expenses are over budget by $1.6 million or 5.2%. This reflects higher spending on Electricity of $2.0 million, 8.6% over budget. Spending at Deer Island Treatment Plant (DITP) was $1.2 million above budget due to higher real time pricing as well as higher usage, and peak demand charges. Higher usage reflects a 14.2% drop in on-site generation which drove a 4.0% rise in purchased power. This offset lower power requirements due to flows being 9.5% under budget. Similarly, Electricity in Field Operations was greater than budget by $792k due to T&D and Generation costs being greater than budget. Lower spending on diesel, $396k, due to better pricing on May's top-off.
- **Other Materials** are $1.9 million under budget or 28.1%, due to underspending on Vehicle Purchases, $862k under budget, reflecting timing and supply chain issues, $317k in furniture expense, and $279k in vehicle expense primarily due to delay in installation of electrical vehicle chargers.
- **Other Services** are $1.4 million under budget or 4.8%, due to lower than anticipated Telecommunication costs of $694k, Other Services $184k under budget, lower Space/Lease Rentals of $265k due to Rock Shed Lease and shelving due to timing, and lower Grit Screening Removal of $116k due to lower quantities.

Indirect Expenses are $58.1 million, $2.4 million or 3.9% under budget due primarily to lower Watershed Reimbursement (including PILOT) of $2.7 million.

Capital Finance Expenses totaled $503.7 million, $2.2 million under budget or 0.4%. Surplus was a result of lower than budget variable interest expense of $3.0 million due to lower interest rates combined with lower SRF spending of $8.0 million due to bond issue timing, and lower Water Pipeline CP of $2.4 million, partially offset by higher Senior Debt of $11.2 million, as a result of defeasance expenditures of $21.8 million.

Revenue and Income –

Total Revenue and Income is $864.7 million, $24.5 million or 2.8% over the estimate. The favorable variance was driven by Investment Income of $17.0 million over the budget due to higher than budget interest rates, Other User Charges which were $4.6 million over the estimate reflecting water purchases from the City of Cambridge during facility maintenance, and Other Revenue of $2.9 million primarily due to receipt of Debt Service Assistance from Commonwealth of $1.2 million, Energy Revenue of $510k, Miscellaneous Revenue of $495k, Permit Fees of $347k, and operating grants of $495k primarily for COVID-19 from FEMA.

	Jun 2023 Year-to-Date			
	Period 12 YTD Budget	Period 12 YTD Actual	Period 12 YTD Variance	%
EXPENSES				
WAGES AND SALARIES	$ 118,980,689	$ 106,433,845	$ (12,546,844)	-10.5%
OVERTIME	5,337,896	5,172,629	(165,267)	-3.1%
FRINGE BENEFITS	23,961,641	23,122,023	(839,618)	-3.5%
WORKERS' COMPENSATION	2,519,751	2,076,732	(443,019)	-17.6%
CHEMICALS	14,994,036	18,038,588	3,044,552	20.3%
ENERGY AND UTILITIES	30,896,365	32,514,216	1,617,851	5.2%
MAINTENANCE	33,241,023	34,317,838	1,076,815	3.2%
TRAINING AND MEETINGS	492,197	258,753	(233,444)	-47.4%
PROFESSIONAL SERVICES	8,197,575	7,546,594	(650,981)	-7.9%
OTHER MATERIALS	6,728,862	4,837,988	(1,890,874)	-28.1%
OTHER SERVICES	28,372,237	27,017,485	(1,354,752)	-4.8%
TOTAL DIRECT EXPENSES	**$ 273,722,272**	**$ 261,336,691**	**$ (12,385,581)**	**-4.5%**
INSURANCE	$ 3,916,002	$ 3,849,201	$ (66,801)	-1.7%
WATERSHED/PILOT	28,890,762	26,150,961	(2,739,801)	-9.5%
HEEC PAYMENT	6,225,566	6,658,205	432,639	6.9%
MITIGATION	1,735,694	1,735,694	-	0.0%
ADDITIONS TO RESERVES	2,418,453	2,418,453	-	0.0%
RETIREMENT FUND	12,555,203	12,555,203	-	0.0%
POST EMPLOYEE BENEFITS	4,754,061	4,754,061	-	0.0%
TOTAL INDIRECT EXPENSES	**$ 60,495,741**	**$ 58,121,777**	**$ (2,373,964)**	**-3.9%**
STATE REVOLVING FUND	$ 96,342,495	$ 88,298,785	$ (8,043,710)	-8.3%
SENIOR DEBT	302,169,940	313,377,111	11,207,171	3.7%
DEBT SERVICE ASSISTANCE	(1,182,494)	(1,182,494)	-	0.0%
CURRENT REVENUE/CAPITAL	18,200,000	18,200,000	-	0.0%
SUBORDINATE MWRA DEBT	75,491,975	75,491,975	-	0.0%
LOCAL WATER PIPELINE CP	6,233,882	3,832,560	(2,401,322)	-38.5%
CAPITAL LEASE	3,217,060	3,217,060	-	0.0%
VARIABLE DEBT	-	(2,985,881)	(2,985,881)	---
DEFEASANCE ACCOUNT	-	-	-	---
DEBT PREPAYMENT	5,500,000	5,500,000	-	0.0%
TOTAL CAPITAL FINANCE EXPENSE	**$ 505,972,858**	**$ 503,749,116**	**$ (2,223,742)**	**-0.4%**
TOTAL EXPENSES	**$ 840,190,871**	**$ 823,207,584**	**$ (16,983,287)**	**-2.0%**
REVENUE & INCOME				
RATE REVENUE	$ 814,648,000	$ 814,648,000	$ -	0.0%
OTHER USER CHARGES	9,836,507	14,456,977	4,620,470	47.0%
OTHER REVENUE	6,139,104	9,037,235	2,898,131	47.2%
RATE STABILIZATION	980,000	980,000	-	0.0%
INVESTMENT INCOME	8,587,260	25,614,246	17,026,986	198.3%
TOTAL REVENUE & INCOME	**$ 840,190,871**	**$ 864,736,458**	**$ 24,545,587**	**2.9%**

Cost of Debt
4th Quarter – FY23

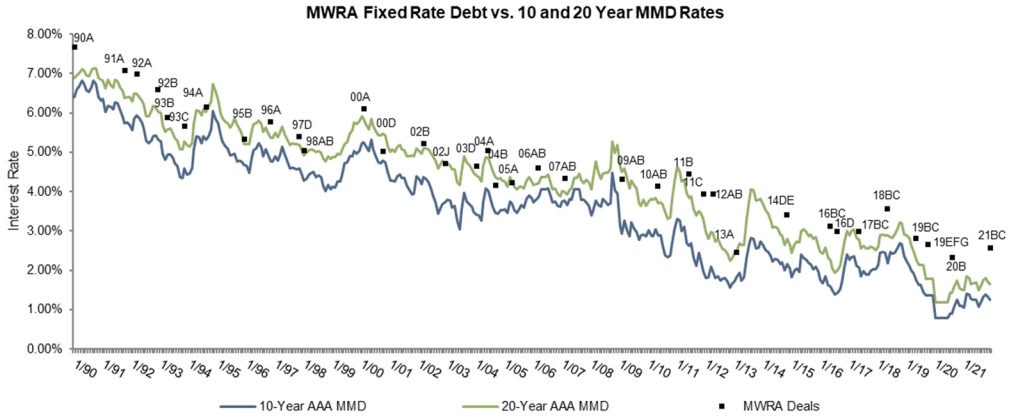
MWRA borrowing costs are a function of the fixed and variable tax exempt interest rate environment, the level of MWRA's variable interest rate exposure and the perceived creditworthiness of MWRA. Each of these factors has contributed to decreased MWRA borrowing costs since 1990.

Average Cost of MWRA Debt FYTD

Fixed Debt ($3.28 billion)	3.32%
Variable Debt ($269.23million)	2.76%
SRF Debt ($808.83 million)	1.70%
Weighted Average Debt Cost ($4.24 billion)	2.97%

Most Recent Senior Fixed Debt Issue
April 2023

2023 Series B and C ($234.3 million) 3.35%

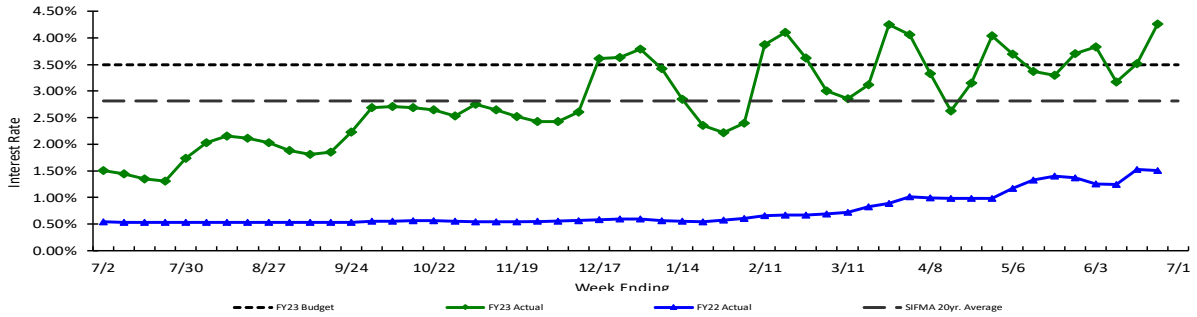


Bond Deal	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A	2004B	2005A	2006AB	2007AB	2009AB	2010AB
Rate	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%	4.17%	4.22%	4.61%	4.34%	4.32%	4.14%
Avg Life	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs	13.5 yrs	18.4 yrs	25.9 yrs	24.4 yrs	15.4 yrs	16.4 yrs

Bond Deal	2011B	2011C	2012AB	2013A	2014D-	2016BC	2016D	2017BC	2018BC	2019BC	2019EFG	2020B	2021BC	2023BC
Rate	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%	3.35%
Avg Life	18.8 yrs	16.5 yrs	17.9 yrs	9.9 yrs	15.1 yrs	17.4 yrs	18.8yrs	11.2 yrs	11.7yrs	11.9yrs	9.73 yrs.	15.6 yrs	12.2 yrs	10.45 yrs

Weekly Average Variable Interest Rates vs. Budget

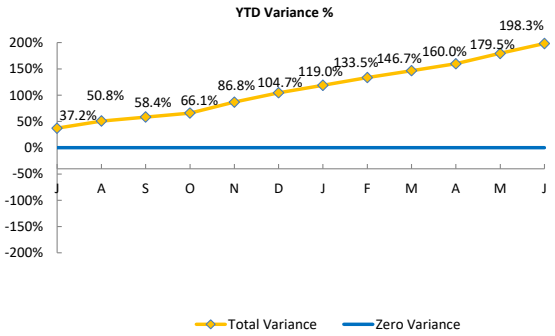
MWRA currently has eight variable rate debt issues with $435.6 million outstanding, excluding commercial paper. Of the eight outstanding series, three have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In June, the Securities Industry and Financial Markets Association rate ranged from a high of 4.18% to a low of 2.84% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate rise as compared to fixed rate debt.



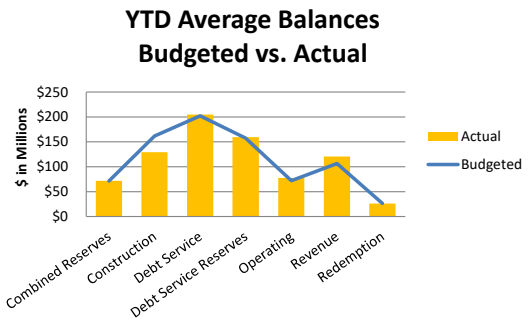
Investment Income
4th Quarter – FY23

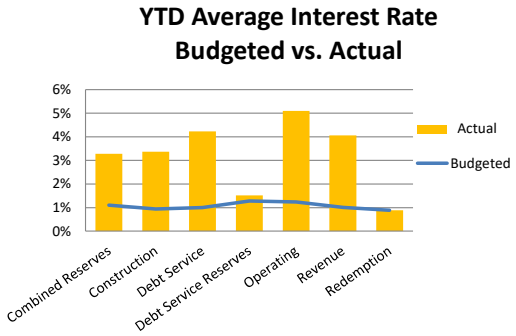
Year To Date

- YTD variance is 198%, or $17 million, over budget due to higher than budgeted interest rates. The Federal Reserve Open Market Committee increased interest rates by 3.5% during FY23.



	YTD BUDGET VARIANCE ($000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserve	$6	$1,566	$1,572	198.9%
Construction	-$411	$2,809	$2,399	153.1%
Debt Service	$26	$6,593	$6,619	327.5%
Debt Service Reser	$28	$370	$398	19.8%
Operating	$71	$2,138	$2,209	248.0%
Revenue	$143	$3,687	$3,830	356.6%
Redemption	$0	$0	$0	0.1%
Total Variance	-$137	$17,164	$17,027	198.3%





Monthly