MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

Fourth Quarter FY2021

Q1	Q2	Q3	Q4

Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
September 15, 2021

Board of Directors Report on Key Indicators of MWRA Performance
Fourth Quarter FY21

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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.

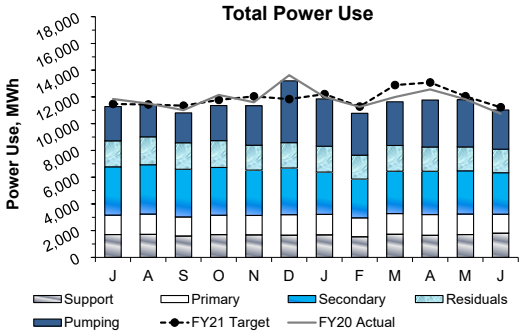
Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer

September 15, 2021

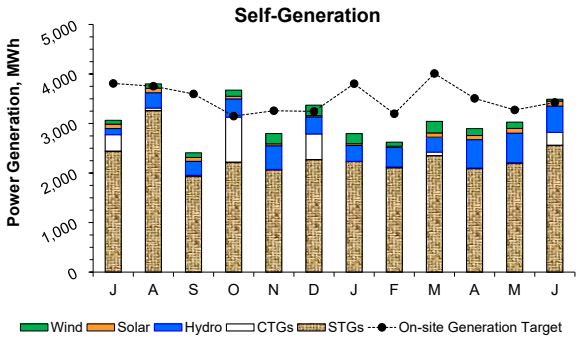
OPERATIONS AND MAINTENANCE

Deer Island Operations

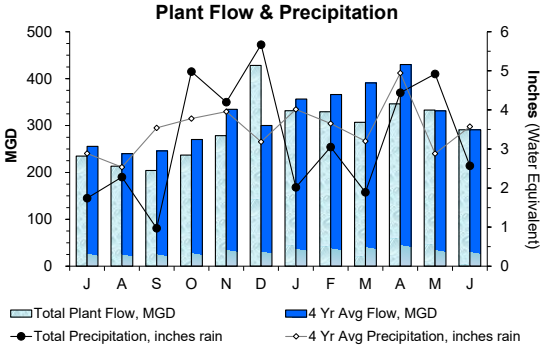
4th Quarter - FY21



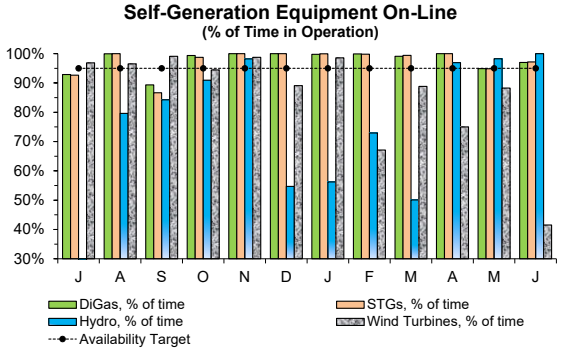
Total power usage in the 4th Quarter was 4.9% below target as plant flow for this period was 7.8% below target with historical data (4 year average) used to generate the electricity model. Power usage was below target for all plant processes, including power usage for raw wastewater pumping which was 8.1% below target due to the lower-than-expected flows. **Overall, total power usage in FY21 was 3.1% below target as total plant flow was 7.3% below the 4 year average plant flow target.**



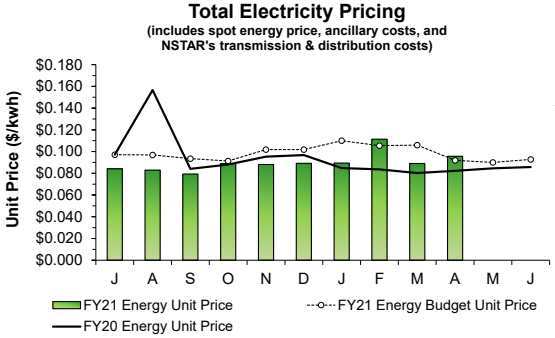
Power generated on-site during the 4th Quarter was 7.7% below target. CTG generation was below target by 57.4% as the units were only operated briefly for checkout purposes in April and May. In June, the CTGs were operated on six (6) days during peak system demand to avoid the capacity charge on DITPs electricity bills, and concurrently on two (2) days for Eversource Demand Response. STGs generation was 12.8% below target as the turbines were offline for several days due to an unanticipated power-related issue on May 22 and to a planned outage for the annual dump condenser cleaning on May 24. Additionally, digester gas production was 12.4% below target which also results in reduced generation. Hydro Turbine generation was 71.6% above target even though Turbine #2 has been offline pending repair of the runner blade assembly due to a budget estimate that was biased low. Wind Turbine generation was 27.6% below target due to mechanical and electrical issues with both turbines this quarter. Generation from the Solar Panels was 1.4% below target**. Overall, power generation was 12.0% below target for FY21.**



Total Plant Flow for the 4th Quarter was 7.8% below target with the budgeted 4 year average plant flow (323.4 MGD actual vs. 350.8 MGD expected) even though precipitation was 5.0% above target (11.93 inches actual vs. 11.40 inches expected). The region had been experiencing drought conditions throughout the spring and only recently began to see the return of significant rainfall and thus more typical plant flows. **Total Plant Flow in FY21 was 7.3% below target as precipitation was on 8.1% below target.**

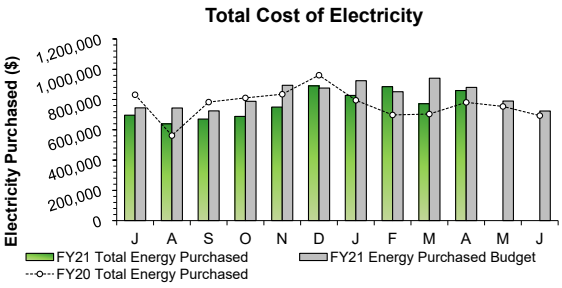


The availability of the DiGas system, STGs, and Hydro Turbine all met their 95% availability target during the 4th Quarter, while Wind Turbine availability fell below target. Wind Turbine availability was 68.3% due to electrical and mechanical issues with both turbines. Turbine #2 has been out of service since May 29 awaiting the arrival of OEM replacement parts from overseas.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Price in April (the most current invoice available) was 4.1% above target with budgetary estimates. The actual total energy unit price in May and June are not yet available as the complete invoices have not been received. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

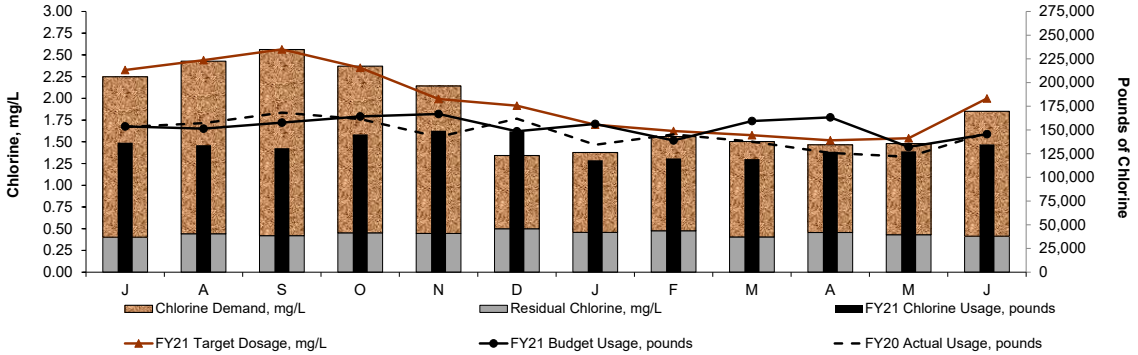
Note: Only the actual energy prices are reported. Therefore, the dataset lags by two (2) months due to the timing of invoice receipt and review.



The Electricity cost data for Electricity Purchased in May and June are not yet available. Year-to-date Total Cost of Electricity is $688,393 (8.2%) lower than budgeted through April as the Total Energy Unit Price was 9.9% lower than target while the Total Electricity Purchased was only 1.8% above target.

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

Deer Island Sodium Hypochlorite Use



The disinfection dosing rate in the 4th Quarter was 5.0% below target with budgetary estimates. Actual sodium hypochlorite usage in pounds of chlorine was 11.7% lower than expected as the 4 year average plant flow used for estimating the hypochlorite usage target was 7.8% lower-than-expected. DITP maintained an average disinfection chlorine residual of 0.43 mg/L this quarter with an average dosing rate of 1.60 mg/L (as chlorine demand was 1.16 mg/L). **Overall in FY21, disinfection dosing was 5.0% below target and sodium hypochlorite usage in pounds of chlorine was 13.5% below target.**

The overall disinfection dosing rate (target and actual) is dependent on plant flow, target effluent total chlorine residual levels, effluent quality and

Secondary Blending Events

Month	Count of Blending Events	Count of Blending Events Due to Rain	Count of Blending Events Due to Non-Rain-Related Events	Secondary, as a Percent of Total Plant Flow	Total Hours Blended During Month
J	0	0	0	100.0%	0.00
A	1	1	0	99.97%	1.17
S	0	0	0	100.0%	0.00
O	2	1	1	99.9%	2.62
N	3	3	0	99.0%	13.63
D	3	3	0	97.4%	41.94
J	1	1	0	99.8%	4.62
F	0	0	0	100.0%	0.00
M	0	0	0	100.0%	0.00
A	2	2	0	99.6%	10.40
M	1	1	0	99.5%	8.40
J	1	1	0	99.84%	3.80
Total	14	13	1	99.49%	86.58

99.7% of all flows were treated at full secondary during the 4th Quarter. There were four (4) secondary blending events due to high plant flows from heavy rain. These blending events resulted in 22.60 hours of blending and 101.10 MGal of primary-only treated effluent with secondary effluent. The Maximum Secondary Capacity during the entire quarter was 700 MGD. Secondary permit limits were met at all times during the 4th Quarter of FY21.

Overall in FY21, 99.5% of all flows were treated at full secondary. There were a total of 14 separate secondary blending events; all but one (1) were due to high plant flows resulting from heavy rain (sometimes in combination with snowmelt). A brief 13 minute dry weather secondary blending event occurred on October 19 during the process of recovering from an unanticipated plant-wide power loss event. These secondary blending events combined produced a total of 86.58 hours of blending and 558.26 MGal of flow blended with secondary effluent.

Deer Island Operations & Maintenance Report

Environmental/Pumping:
The plant achieved an instantaneous peak flow rate of 953.3 MGD in the 4th Quarter during the early morning of May 29. This peak flow occurred during a storm event that brought 2.2 inches of precipitation to the metropolitan Boston area. Overall, Total Plant Flow in the 4th Quarter was 7.3% below target with the 4 year average plant flow estimate for the quarter.

Work on the Winthrop Terminal Facility (WTF) VFD (Variable Frequency Drive) and Synchronous Motor Replacement project was started by the contractor in 2018 and entails the demolition of existing older obsolete equipment (electrical systems, motors and VFDs on each of the six (6) raw wastewater pumps). These pumps were powered by 600 volts service which were changed to 4,160 volts service as part of this project to make them consistent with the other major pumps in both the South System Pump Station (SSPS) and the North Main Pump Station (NMPS). The contractor completed the upgrade of WTF Pump #1 in April and the 30 day performance test was successfully completed on May 9. As a result, the upgrade has now been completed on all six (6) pumps and this contract was declared substantially complete.

Secondary Treatment:
Annual turnaround maintenance on Train #2 at the Cryogenic Oxygen Facility began during the last week of April and continued through the first week of May. This turnaround maintenance is performed on roughly half of the components and systems in the Cryogenic Oxygen Facility and is a two (2) week process. Train #1 was in operation while Train #2 was offline during this maintenance. The same turnaround maintenance will be performed on Train #1 in the fall.

Disinfection:
The West Disinfection Basin (Basin #2) was taken offline for 1.8 days, during dry weather/low plant flow conditions, from April 13 to April 15 to allow staff to replace the faulty gearbox and mixer for one (1) of the two (2) chlorine flash mixers located at the head end of the disinfection basin. The target chlorine residual (prior to dechlorination) was increased during operation of the single disinfection basin (Basin #1) to compensate for the reduced chlorine contact time thus ensuring fecal coliform inactivation below effluent permit limits. Additionally, the sodium bisulfite feed was also increased to ensure sufficient dechlorination at these higher residual chlorine levels to meet effluent total chlorine residual permit limits. The DEP and EPA were provided with a courtesy notification in advance of this maintenance activity.

Deer Island Operations & Maintenance Report (continued)

Odor Control Treatment:
In May, carbon adsorber (CAD) units #2 in the East Odor Control (EOC) Facility, #4 in the West Odor Control (WOC) Facility, and #4 in the Residual Odor Control (ROC) Facility were emptied and refilled with new activated carbon media as part of routine maintenance to replace spent activated carbon.

Residuals Treatment:
The rehabilitation of Gravity Thickener #5 under the major Gravity Thickener Rehabilitation project was completed in May. As a result, the rehabilitation has now been completed on all six (6) gravity thickeners. These gravity thickeners are used to concentrate sludge that is generated from the primary treatment process, and scum that is generated from all treatment processes. The sludge and scum thickening equipment and five (5) of the six (6) Fiberglass-Reinforced Plastic (FRP) domed covers had reached the end of their useful lives and were in need of replacement. This rehabilitation project upgraded all six (6) gravity thickeners including the complete replacement of each tank's sludge and scum thickening equipment as well as replacement of five (5) of the six (6) FRP dome covers (the FRP domed cover for Gravity Thickener #2 has already been replaced). Additionally, critical components which were previously fabricated from carbon steel, including the center columns and center cages, are now fabricated from type 316 stainless steel in order to provide superior protection against hydrogen sulfide gas which is present in high concentrations in this highly corrosive environment.

Energy and Thermal Power Plant:
Overall, total power generated on-site accounted for 27.2% of Deer Island's total power use for the 4th Quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 26.4% of Deer Island's total electrical power use for the quarter.

The boilers in the Thermal Power Plant were taken offline starting in the late evening of May 23 to allow the contractor and DITP Maintenance staff to complete the annual dump condenser cleaning on May 24 prior to placing the steam system in summer operating mode. Boiler 201 was returned to operation later that evening, following the dump condenser work, to restore steam production and steam turbine power generation. The Thermal Power Plant began operating the steam system in summer mode starting on May 27 to maximize the energy generation from the steam turbines while minimizing additional fuel oil usage during the seasonally lower plant heat demand period.

CTG-2B was operated for 3.7 hours on June 8 for an ISO-New England declared Demand Response summer audit event and concurrently during peak system demand to avoid the capacity charge. The CTGs were operated a total of six (6) days in June during peak system demand.

Regulatory:
Emissions compliance testing on the Secondary Odor Control (SOC) treatment system on DITP was conducted by consultants from June 23 to June 24. The SOC treatment system treats combined process air from the secondary batteries and the reactors. The DITP Air Quality Operating Permit issued by the MA DEP requires that DITP conduct emissions compliance testing for the various emission units once every five (5) years to demonstrate compliance with applicable total reduced sulfur (TRS) and non-methane hydrocarbon (NMHC) emission limits. This testing requires the continuous emissions monitoring of the outlet of the odor control system over a 24-hour period for TRS and NMHC at the outlet (stack) of the odor control system. Even though it is not required by the operating permit, the inlet was also sampled for target Volatile Organic Compounds (VOCs). All the preliminary test results show that DITP was in compliance. The draft report summarizing the test results is currently being prepared by the consultants.

Public Access:
MWRA, state and local officials, and fishing advocates cut the ribbon on the new Deer Island Recreational Fishing Pier on June 24 for its official grand opening. Energy and Environmental Affairs (EEA) Secretary Kathleen Theoharides joined MWRA, state and local officials, fishing advocates, and youth anglers for the ribbon cutting ceremony. The fishing pier was constructed by the Department of Fish and Game's (DFG) Division of Marine Fisheries (DMF), in cooperation with DFG's Office of Fishing and Boating Access, the MWRA, and the City of Boston. The $2.4 million project was paid for mostly with funds from the sale of Massachusetts recreational saltwater fishing permit, with additional assistance from the MWRA. The unofficial opening of the fishing pier took place on November 25, 2020 when the public was able to begin using the pier.

Clinton Operations & Maintenance Report

Dewatering Building
Operation's staff washed down gravity thickener # 1. They also unplugged and pumped down GT scum well. Maintenance cleaned out grit, rags, and debris out of # 3 sludge thickened transfer pumps suction header.

Chemical Building
Maintenance completed the cleaning and rebuilding of # 1 soda ash pump. Staff also disassembled and cleaned # 2 soda ash pump. Operations staff cleaned calibration columns on both polymer pumps. Maintenance installed a new # 1 RAS pump. Staff Jetted clean soda ash feed line "A'. Maintenance repaired leak on hypochlorite pump chemical feed system piping. They also installed a new # 2 hypochlorite pump.

Aeration Basins
Operations staff cleaned pH and DO probes. Maintenance staff replaced drive motor on Aerzen 6B blower. They also completed oil changes on #4 and #6 Aerzen blowers. Maintenance staff with help from contractor replaced and calibrated three pH probes. Deer Island staff replaced control transformer on 6A aeration blower.

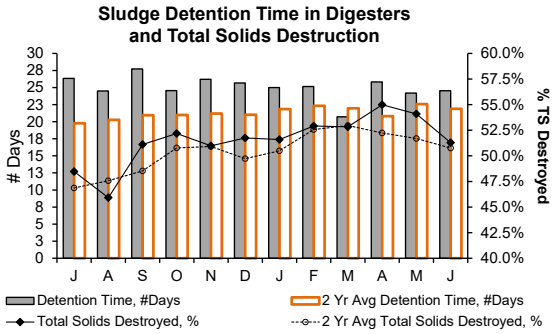
Phosphorus Building
Maintenance staff acid washed all three disk filters, cleaned troughs, and inspected all nozzles. Operation staff cleaned both CL17 chlorine analyzers.

Headworks
Maintenance staff continues to work on # 1 bucket elevator system. Contractor replaced leaking boiler condensate piping and installed new fill valve. Maintenance installed sparge air system arm and diffusers on #1 aerated grit tank piping. Staff cleaned mechanical bar rack and filled gear box with 220 meropa oil. Contractor completed welding # 2 classifier belly pan.

Digester Building
Maintenance staff checked all equipment for proper operation. Operations staff cleaned the foam on the floating cover. Contractor installed new ultrasonic sensor on floating cover. Maintenance staff greased Ovivo mixer on floating cover.

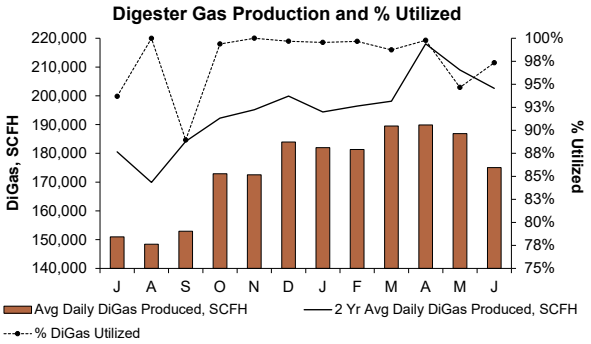
Deer Island Operations and Residuals

4th Quarter - FY21



Total solids (TS) destruction following anaerobic sludge digestion averaged 53.5% during the 4th Quarter, 3.7% above target with the 2 year average of 51.6%. Sludge detention time in the digesters was 24.9 days, 14.2% above target, as DI operated with an average of 8.0 digesters. **Overall in FY21, TS destruction averaged 51.5%, 2.2% higher than the 2 year average of 50.4%. Sludge detention time was 25.0 days, 17.5% higher than the 2 year average of 21.3 days.**

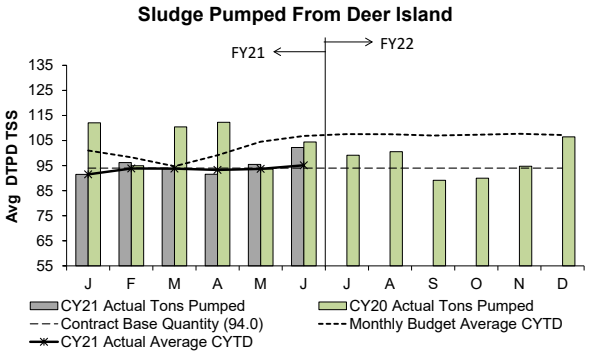
Total solids (TS) destruction is dependent on sludge detention time which is determined by primary and secondary solids production, plant flow, and the number of active digesters in operation. Solids destruction is also significantly impacted by changes in the number of digesters and the resulting shifting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



The Avg Daily DiGas Production in the 4th Quarter was 12.4% below target with the 2 Year Avg Daily DiGas Production due to much lower-than-expected primary sludge production which breaks down more readily during anaerobic sludge digestion. On average, 97.3% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant (TPP). **Overall in FY21, the Avg Daily DiGas Production was 10.9% below target, with an average of 97.6% utilization of DiGas at the TPP.**

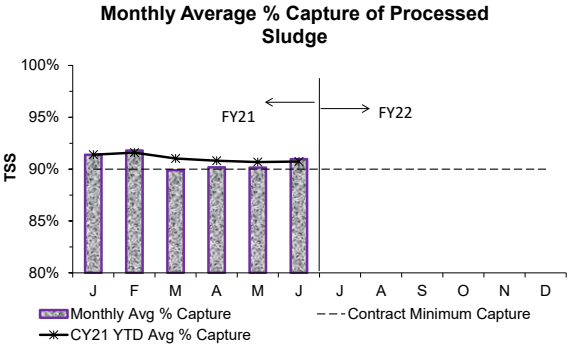
Residuals Pellet Plant

New England Fertilizer Company (NEFCO) operates the MWRA Biosolids Processing Facility (BPF) in Quincy under contract. MWRA pays a fixed monthly amount for the calendar year to process up to 94.0 DTPD/TSS as an annual average (for the extended contract period of January 1, 2021 through December 31, 2022). The monthly invoice is based on 94.0 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional payments are made on any quantity above the base amount. On average, MWRA processes more than 94.0 DTPD/TSS each year (FY21's budget is 107.9 DTPD/TSS and FY22's budget is 106.2 DTPD/TSS).

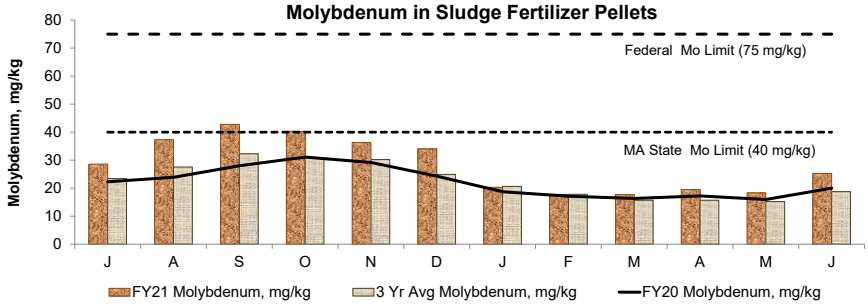


The average quantity of sludge pumped to the Biosolids Processing Facility (BPF) in the 4th Quarter was 96.4 TSS Dry Tons Per Day (DTPD) - 18.9% below target with the FY21 budget of 119.0 TSS DTPD for the same period.

The CY21 average quantity of sludge pumped through June is 95.1 DTPD - 11.0% below target compared with the CY21-to-date average budget of 106.8 DTPD during the same time period.



The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 4th Quarter was 90.43% and the CY21-to-date average capture was 90.73%.



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

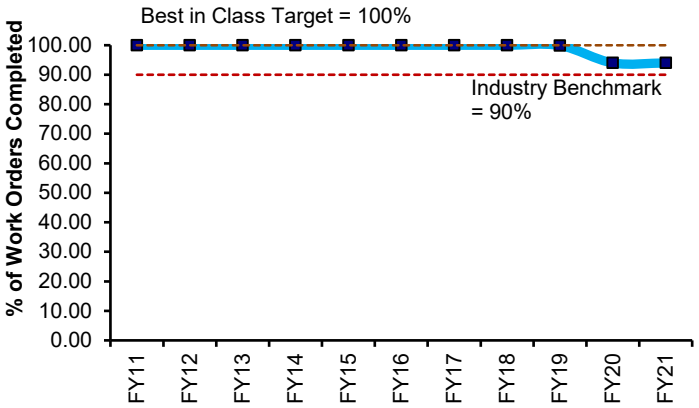
Overall, the levels have been below the DEP Type 1 limit for all three (3) metals. For Mo, the level in the MWRA sludge fertilizer pellets during the 4th Quarter averaged 16.6 mg/kg, 27.0% above the 3 year average, 47% below the MA State Limit, and 72% below the Federal Limit.

Deer Island Yearly Maintenance Metrics

4th Quarter - FY21

Proactive and Productivity Measures

Preventive Maintenance



The industry benchmark is 90% for Preventive 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 since FY01. PM completion rate was 94% in FY21 We managed to meet the Industry Benchmark, but the slight decrease was caused by vacancies and COVID-19 staff absences due to quarantining.

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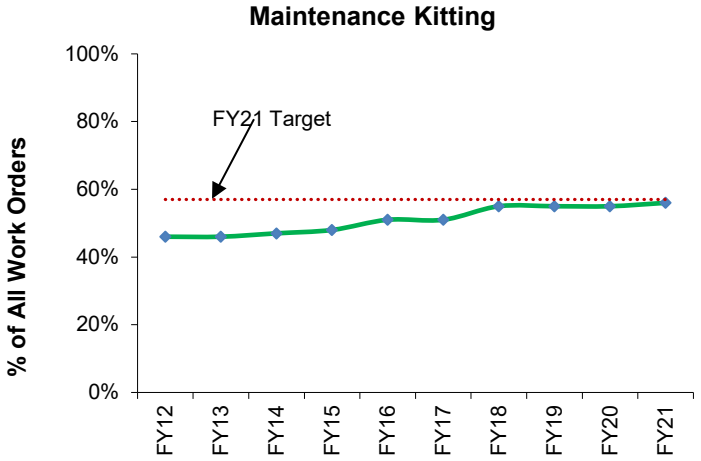
Maintenance Kitting



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 (above) 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 FY21 was 56%, just below DITP's goal of 57%, kits were prepared, but some had to be put on hold because of vacancies and COVID-19 staff absences due to quarantining.

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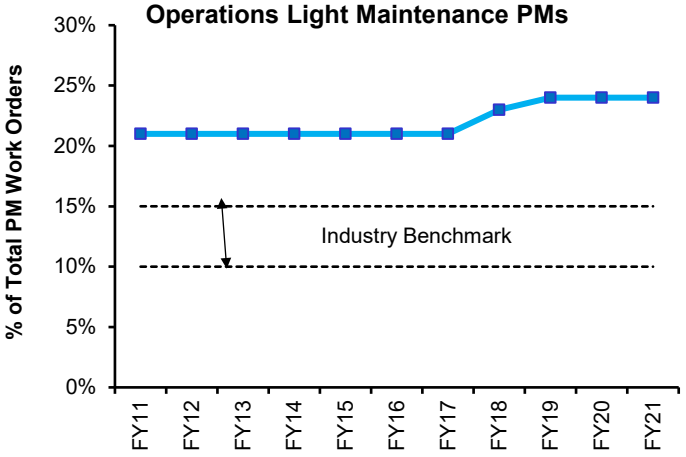
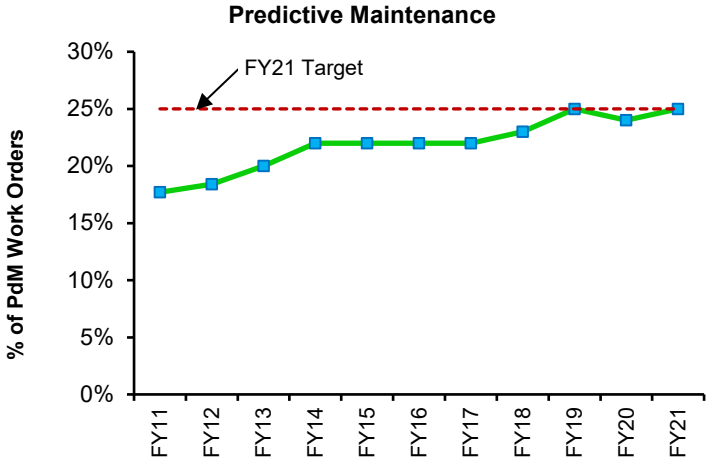
Operations Light Maintenance PMs



The percentage of preventive maintenance work order hours completed by Operations staff (non maintenance staff) increased from less than 1% in January 2002 to the current level of 24% in FY21. DITP reached the industry benchmark range of 15% in April 2003 and has exceeded the goal through FY21. Operations completes approximately 664 PM work orders per month. Operations work percentage stayed on track as operations was fully staffed through COVID-19.

Predictive Maintenance

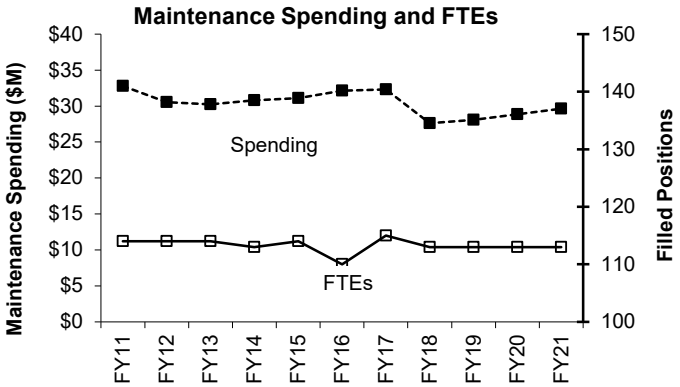


Predictive maintenance has steadily increased from 2% in FY03 to 25% in FY21, DITP's met the FY21 goal of 25%. This percentage in predictive maintenance was achieved through the expanded use of lubrication, vibration, thermography, and acoustic ultrasonic testing techniques. The Condition Monitoring Group continually reviews and investigates new opportunities and initiatives to expand condition monitoring testing and analysis. The slight increase of Predictive Maintenane work orders, is due to less total work orders being generated beauses vacancies and COVID-19 staff absences for quarantining.

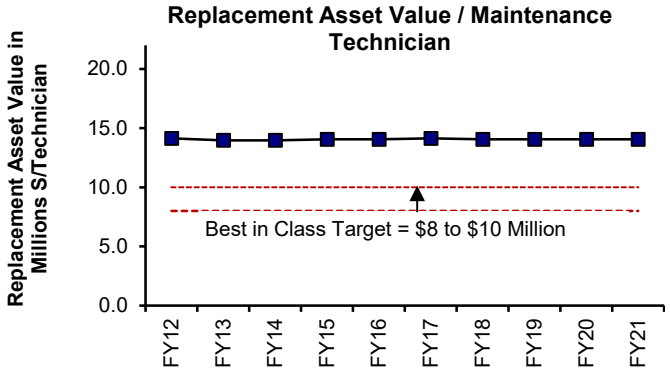
Deer Island Yearly Maintenance Metrics

4th Quarter - FY21

Overall Maintenance Program Measures

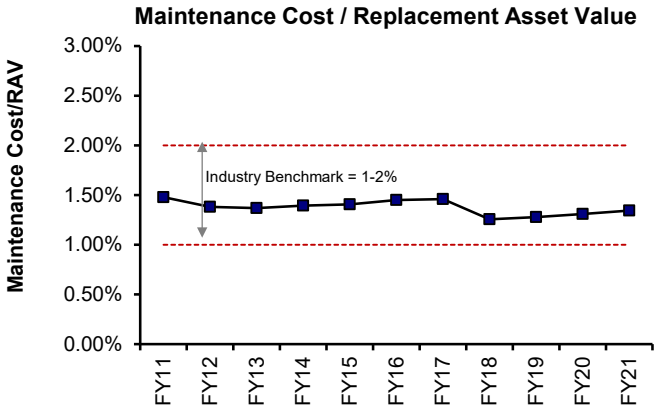


DITP's Maintenance staff is currently at 113 FTE's. Maintenance staff levels ended at 113, but for the majority of the year we had limited staff due to COVID-19, retirement and hiring challenges. Maintenance has worked to meet our goals though implementation of numerous maintenance efficiencies including: Operations preforming light maintenance, cross-functional training and flexibility, and Reliable-Centered Maintenance. This year's Maintenance spending increased for materials and services, but not all parts were installed.

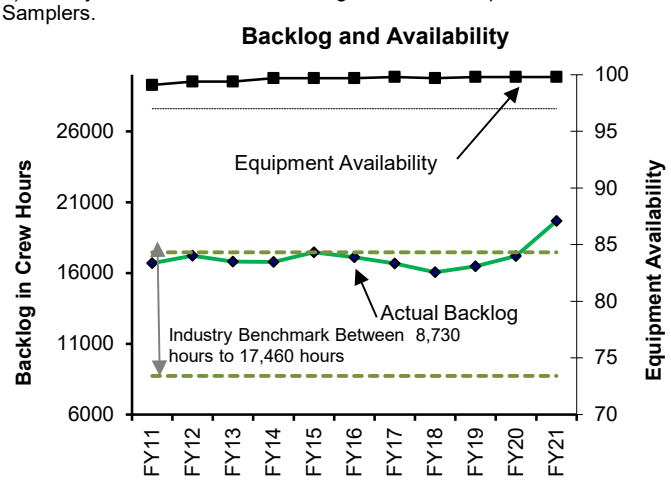


DITP adopted a "best in class" target of $8-$10 Million/Technician for maintenance staffing. DITP remains above this Best in Class. However, as the plant ages and additional equipment replacements are expected, DITP management will reassess staffing as needed.

The Maintenance Spending graph shows actual annual maintenance spending and significant CIP asset replacements (equipment costs only). Maintenance budgeting continues to evaluate plant assets and requirements for replacement of obsolete equipment to ensure the plant operates at maximum efficiency. In FY21, overall spending increased slightly from FY20 due to some large Maintenance Projects; Winthrop Motors and VFD Replacements, Gravity Thickener Rehabilitation, Gravity Thickener Overflow Piping Replacement, Gas Protection System Replacements, Coating Contract (Digesters, Overflow Boxes, Primary Scum Wells and Carbon Absorbers), two Hydro Plant Electrical Building Air Handler Replacements, Installation of two W3 Strainers, and the installation of New Explosion Proof Grit Samplers.



The industry benchmark for annual maintenance spending is between 1% to 2% of replacement asset value, currently DITP is at 1.32%. The plant's replacement asset value is calculated at approximately $2.6 billion dollars. DITP's current maintenance spending is within the industry benchmark. Maintenance spending has increased since last year. DITP Maintenance CEB spending is $23.7 million coupled with CIP spending of $5.9 million (equipment costs only), totaling $29.6 million.



Industry benchmark for Equipment Availability is 97%. Deer Island has exceeded this benchmark over for the last ten years. In FY21 the availability was 99.8%. The high percentage in Equipment Availability during FY21 is due to redundancy of equipment and effective/efficient maintenance practices.

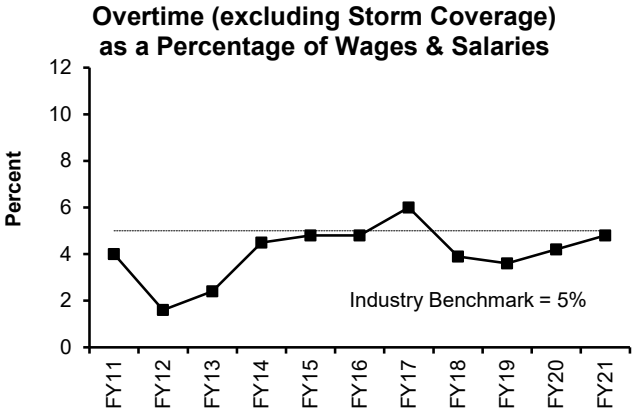
Industry Benchmark for Backlog is between 8,730 to 17,460 hours for maintenance based on current staffing, the total average backlog for FY21 was 19,672 hours, which exceeds industry benchmark, due to vacancies and COVID-19 staff absences due to quarantining.

Non-Critical work orders were deferred for critical work orders, to ensure Deer Island Plant would operate at maximum capacity.

Deer Island Yearly Maintenance Metrics

4th Quarter - FY21

Overall Maintenance Program Measures (cont.)



Management continues its effort to keep overtime below the industry benchmark. DITP maintenance overtime was 4.8% for FY21. 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.

The slight increase in overtime from last year was because of vacancies and staff absences due to quarantining.

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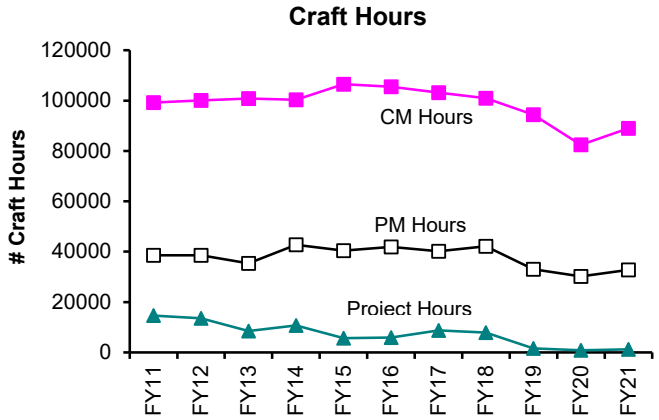
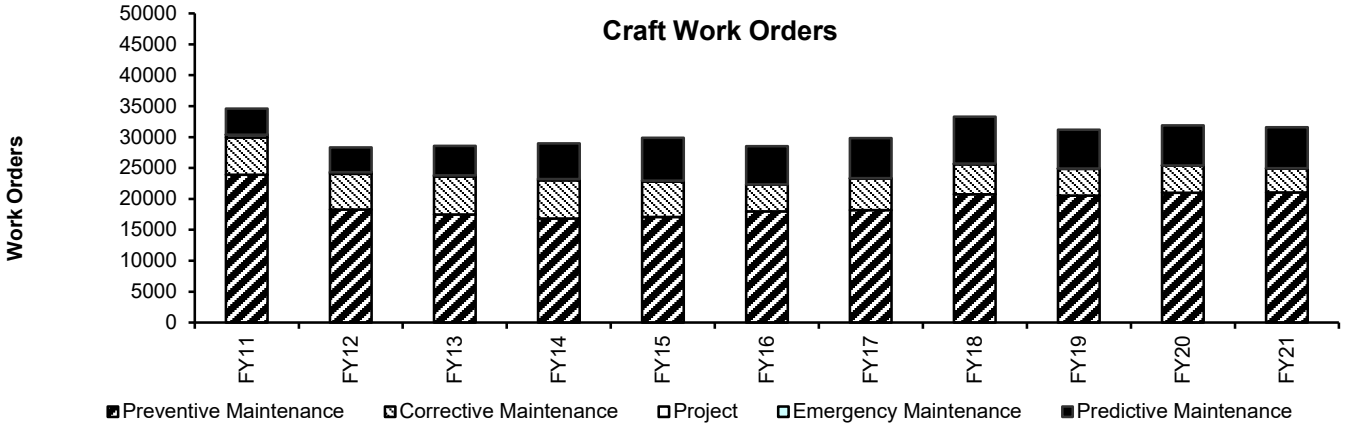


Continued optimization of the Preventive Maintenance (PM) program through the transfer of some light maintenance tasks from Maintenance to Operations staff (24% of PM work orders in FY21), elimination of duplicate work orders, combining some PM's, increasing PM frequency due to equipment history. This process was delayed because of vacancies and staff absences due to quarantining.

This years significant increase in Corrective Maintenance (CM) hours was due to staff focused on (CM) work orders to ensure all critical equipment was on-line. Project work was put on hold.

Maintenance did complete some significant maintenance work in FY21: Overhauled Centrifuges #11 and #12, Primary AHU Coil Replacement BD:SA.AHU-2, Resuduals Air Coil Replacement, Grit Screw Replacement AD:GR.CLSF-16, Fabrication of Grit Screws, Relacement Heating Actuator Valve for FA:SA.AHU-5, and Replacement of Secondary Air Condensing Unit Electrical Building #9.



During FY21, the overall number of work orders decreased by 56 from the previous year. The decrease in work orders was because of vacancies and staff absences due to quarantining.

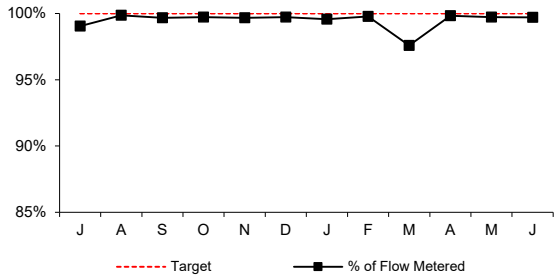
The Planning department is continuously modifying PM, PdM, and CM Job Plans to ensure maintenance is being performed efficiently and effectively, while ensuring reliability and availability of DITP's Assets.

Operations Division Metering & Reliability

4th Quarter 2021 - FY21

WATER METERS

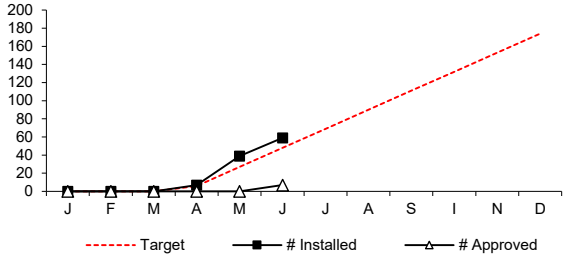
Percent of Total Revenue Water Deliveries Calculated Using Meters



The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During Q4 FY21, 0.25% of the billed water flow was estimated. 99.75% was based on meter actuals. A total of 2.85% of the total flow was measured using annubar meters, mostly due to bypass valves that were opened in Lexington to increase the available flow to Burlington.

WASTEWATER METERS

Wastewater Meter Replacement Project Status

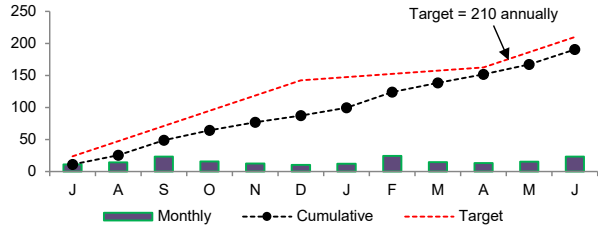


The Wastewater Meter Replacement Project was approved at the October 2020 Executive Board meeting. The first installations were performed in the final week of April. During the Q4 of FY21 the contractor installed a total of 59 meters and confirmed 7 meters out of a total of 174. The table above tracks the # of installed meters over the course of the project. The contract requires completion of installations in CY2021.

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

WATER DISTRIBUTION SYSTEM PIPELINES

Miles Surveyed for Leaks



During the 4th Quarter of FY21, 51.94 miles of water mains were inspected. The total inspected for the fiscal year to date is 190.48.

Leak Backlog Summary

Month	J	A	S	O	N	D	J	F	M	A	M	J	Totals
Leaks Detected	2	2	5	3	1	1	5	0	0	2	1	0	22
Leaks Repaired	2	1	3	2	2	4	3	1	2	2	3	0	25
Backlog	6	7	9	10	9	6	8	7	5	5	3	3	n/a

During the 4th Quarter three leaks were detected, and five were repaired. Refer to FY21 Leak Report below for details. Also, community service ranging from individual leak location to hydrant surveys were conducted for Arlington, Malden, Medford, Newton, Revere & Somerville.

4th Quarter 2021 - Leak Report

Date Detected	Location of Leaks	Repaired
07/05/20	Riverside Ave. @ Commercial St. Medford	07/08/20
07/28/20	Harvard Pilgrim Health, Wellesley	07/30/20
08/03/20	#93 Worcester Street, Wellesley	08/05/20
09/03/20	Felton St. @ Water St., Waltham	09/22/20
09/12/20	#56 Forbes Hill Rd., Quincy. Sec-22	09/12/20
09/24/20	Frontage Rd. @ Venner Rd., Arlington	09/25/20
09/24/20	#93 Worcester St., Wellesley. Sec-80	10/07/20
10/16/20	Morton St. @ Blue Hill Ave. Boston	10/23/20
10/20/20	Lee St. @ Boylston St. Brookline	11/12/20
10/30/20	#263 Brdwy. RT-1 Southbound-Saugus	11/05/20
07/20/17	Mystic Valley Parkway, Medford	12/04/20
09/02/20	Mt Vernon Ave @ E. Albion St., Somerville	12/04/20
11/06/20	#109 Broadway @ Spring St., Saugus	12/10/20
12/01/20	Second St. @ Carter St., Chelsea	12/09/21
06/17/15	Washington St. at East Dedham - Sect 78	01/14/21
01/08/21	#2 Lynnfells Pkwy/Fellsview, Stoneham	01/25/21
01/21/21	#1305 Columbus Pk Sewer Station, So. Boston	01/21/21
01/08/21	#2 Lynnfells Pkwy/Pond St., Stoneham	02/22/21
01/14/21	West St. @ Pierce St. Hyde Park	03/02/21
01/14/21	Vose Ave. @ Pleasant St. Hyde Park	03/02/21
06/08/15	Allandale Rd. @ Grove St., Brookline	04/15/21
04/07/21	Washington St @ Broad St., Lynn Sec-87	04/09/21
04/27/21	Fellsway E. Ext @ Brook St., Stoneham	05/04/21
12/04/16	1025 W. Roxbury Pkwy, Brookline. Sect 95	05/13/21
05/13/21	Broad St. @ Market St., Lynn	05/20/21

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

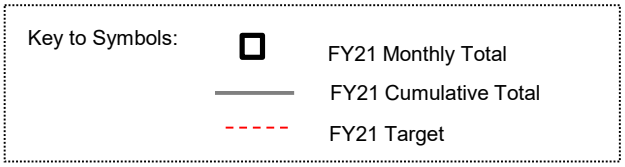
Water Distribution System Valves

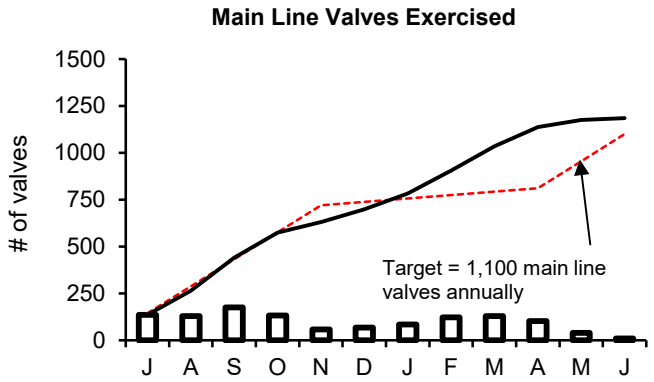
4th Quarter FY21

Background

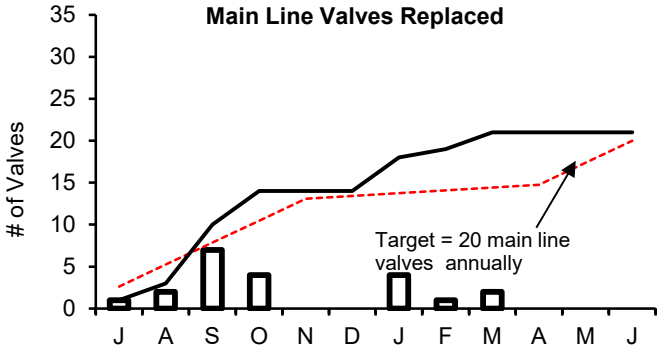
Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but is often displaced during the construction season. This is due to the fact that a large number of construction contracts involving rehabilitation, replacement, or new installation of water lines, requires valve staff to operate valves and assist with disinfection, dechlorination, pressure-testing, and final acceptance. Valve exercising can also be impacted due to limited redundancy in the water system; valve exercising cannot be performed in areas where there is only one source of water to the community meters or flow disruptions will occur.

Type of Valve	Inventory #	Operable Percentage	
		FY21 to Date	FY21 Targets
Main Line Valves	2,159	96.9%	95%
Blow-Off Valves	1,317	98.5%	95%
Air Release Valves	1,380	95.5%	95%
Control Valves	49	100.0%	95%

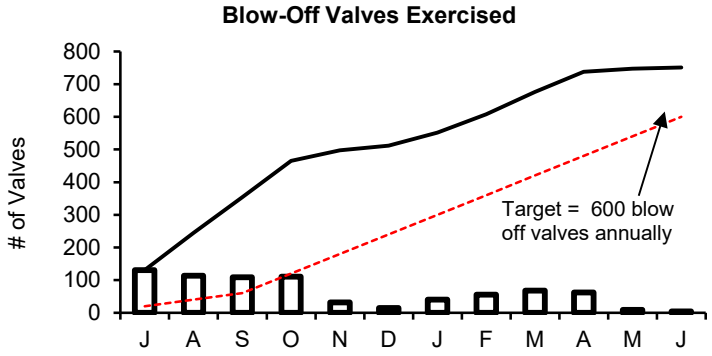




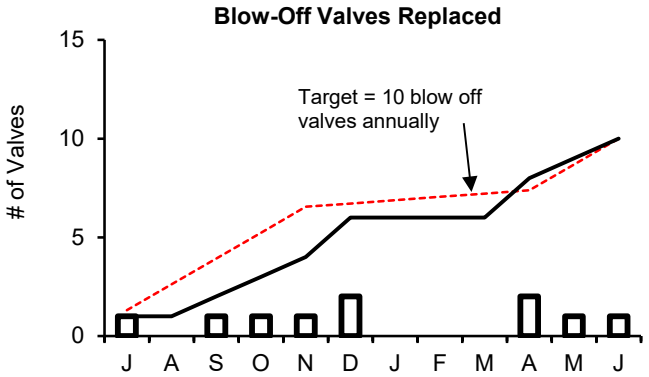
During the 4th Quarter FY21, 151 main line valves were exercised. The total exercised for the fiscal year to date is 1,185.



During the 4th Quarter FY21, there were no main line valves replaced. The total replaced for the fiscal year to date is 21.



During the 4th Quarter FY21, 75 blow off valves were exercised. The total exercised for the fiscal year to date is 751.



During the 4th Quarter FY21, there were 4 blow off valves replaced. The total replaced for the fiscal year to date is 10.

Water Distribution System Valves

4th Quarter FY21

Background

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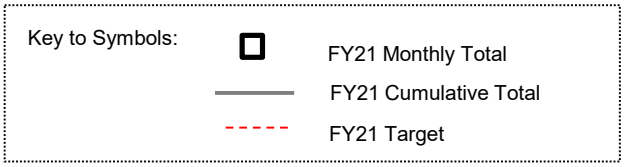

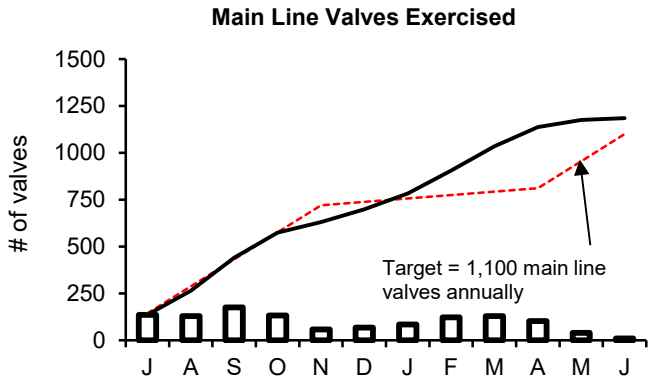

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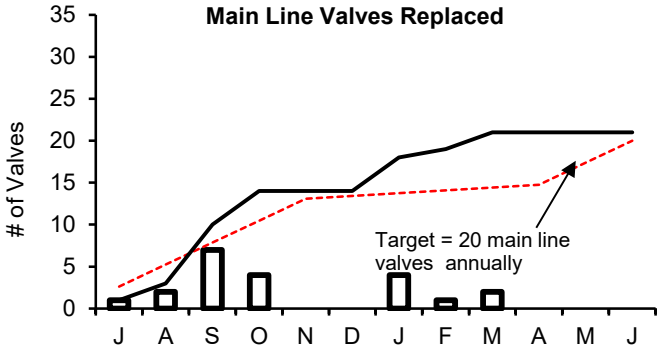

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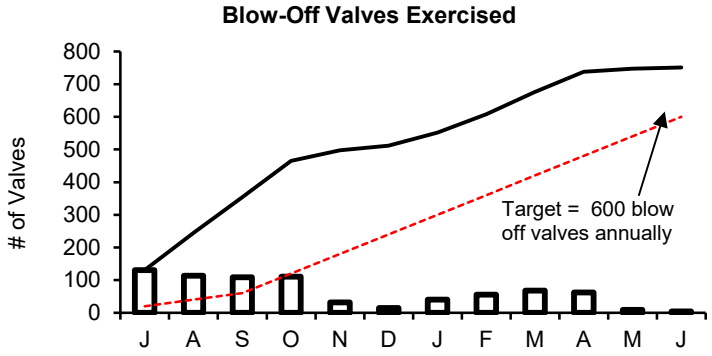

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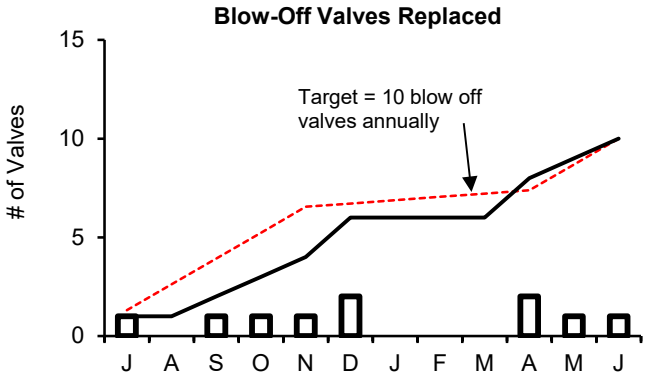

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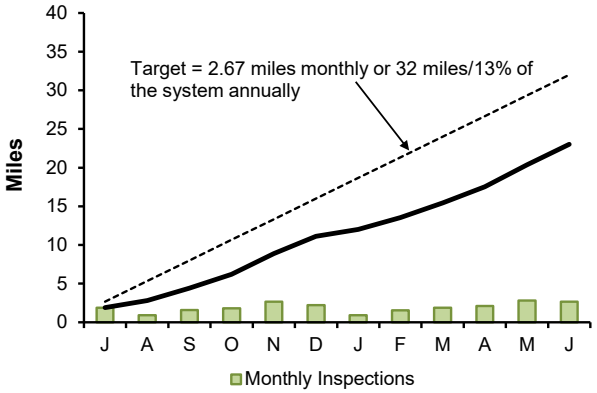
Wastewater Pipeline and Structure Inspections and Maintenance

4th Quarter 2021 - FY21

Wastewater Pipeline and Structure Inspection and Maintenance performances measures have seen improved progress toward FY21 targets, but have fallen short of expected targets. This was primarily due to key staff vacancies and some Covid -19 exposures.

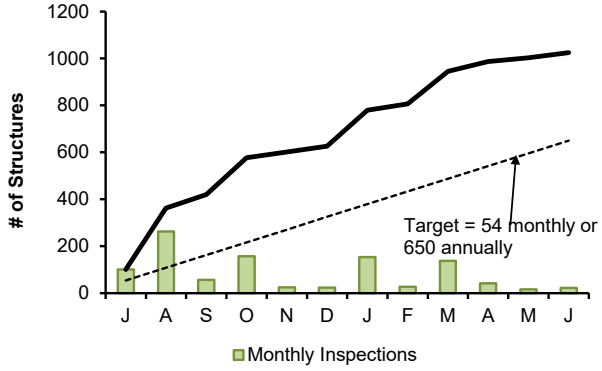
Inspections

Pipeline Inspections



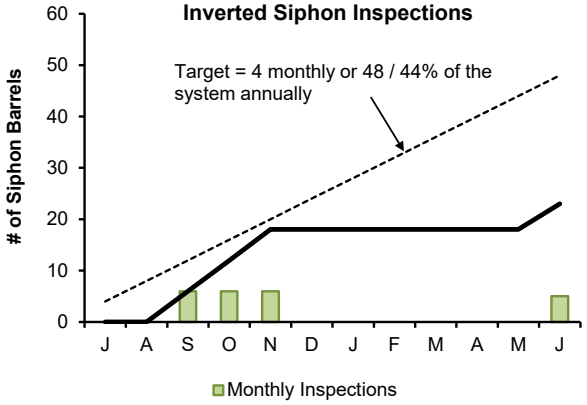
Staff internally inspected 7.58 miles of MWRA sewer pipe during this quarter.The year to date total is 23.02 miles. No Community Assistance was provided. Shortcomings for the quarter were a direct result of staffing availability, and equipment issues.

Structure Inspections



Staff inspected the 36 CSO structures and performed 90 other additional manhole/structure inspections during this quarter. The year to date total is 1025 inspections.

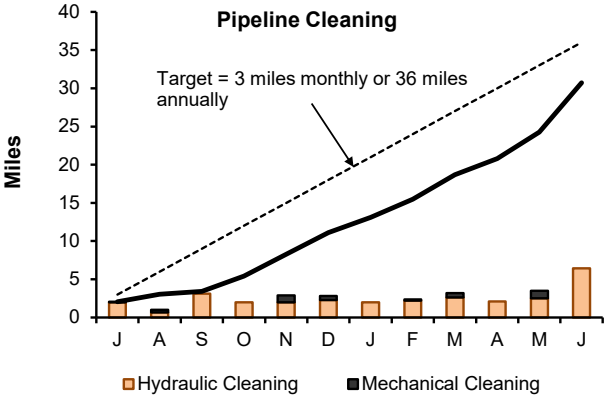
Inverted Siphon Inspections



Staff inspected 5 siphon barrel this quarter. The year total is 23 inspections. Shortcomings for the quarter were a direct result of staffing availability, and equipment issues.

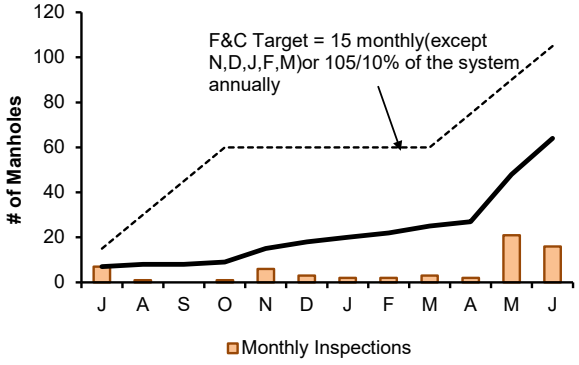
Maintenance

Pipeline Cleaning



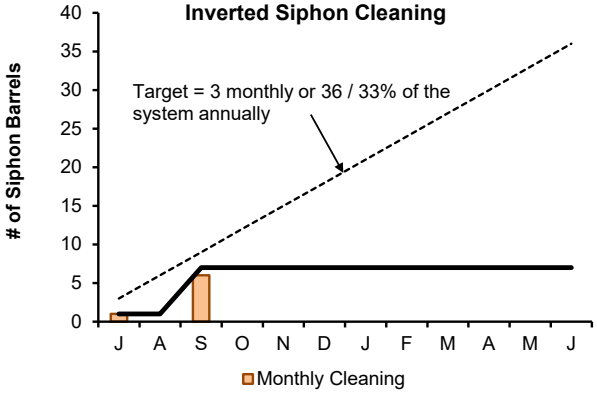
Staff cleaned 11.04 miles of MWRA sewer pipe, and removed 49 yards of grit. The year to date total is 30.72 miles. No Community Assistance was provided. Shortcomings for the quarter were a direct result of staffing availability.

Manhole Rehabilitation



Staff replaced 39 frame and cover replacement this quarter.The year to date total is 64. Shortcomings for the quarter were a direct results of staffing availabilty.

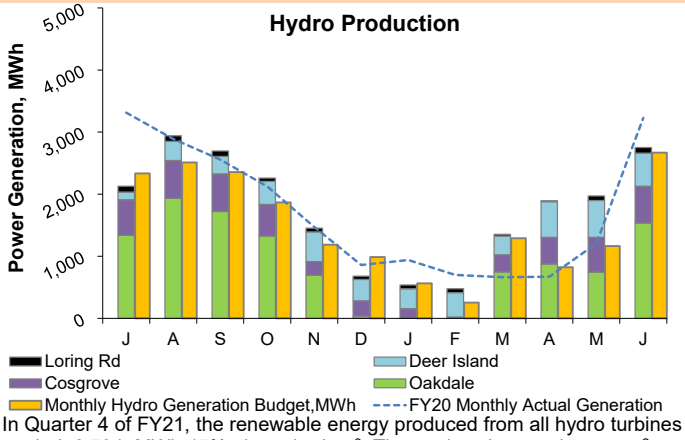
Inverted Siphon Cleaning



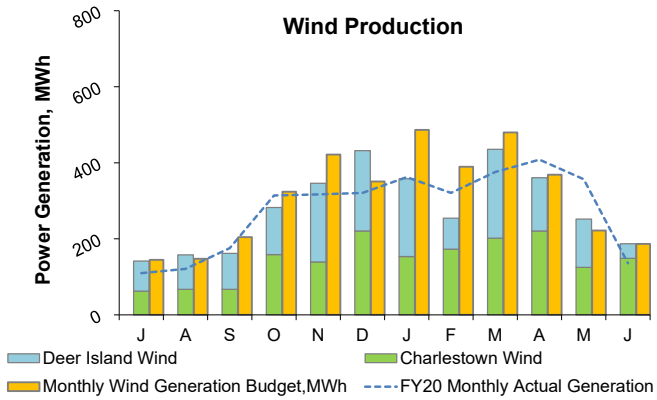
Staff did not clean any siphon barrel this quarter. Shortcomings for the quarter were a direct results of staffing availability.

Renewable Electricity Generation: Savings and Revenue

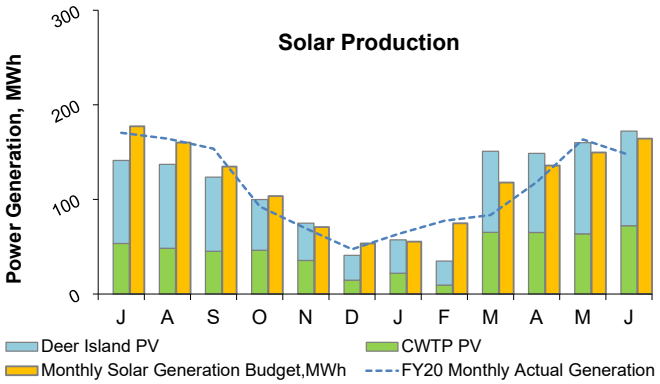
4th Quarter - FY21



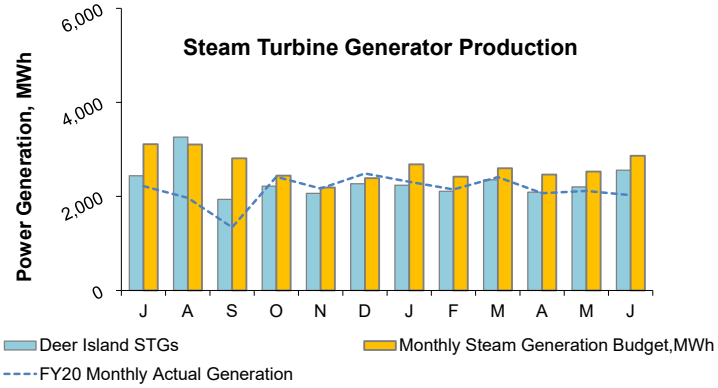
In Quarter 4 of FY21, the renewable energy produced from all hydro turbines totaled 6,734 MWh;45% above budget[3]. The total savings and revenue[2] to date in FY21 (actuals through April[1]) is $650,407 ; 2% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



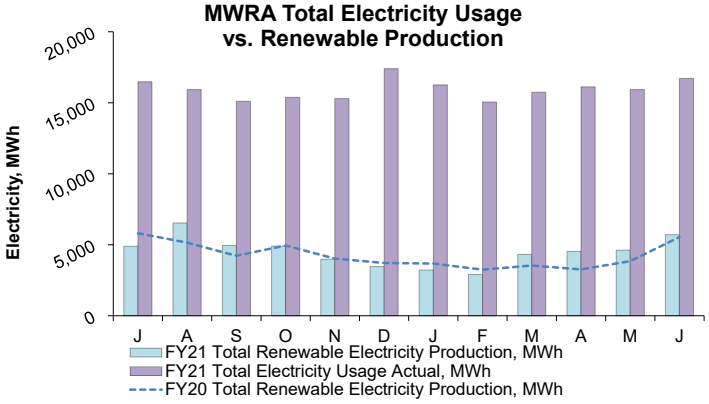
In Quarter 4 of FY21, the renewable energy produced from all wind turbines totaled 800 MWh; 3% above budget[3]. The total savings and revenue[2] to date in FY21 (actuals through April) is $426,882, 13% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

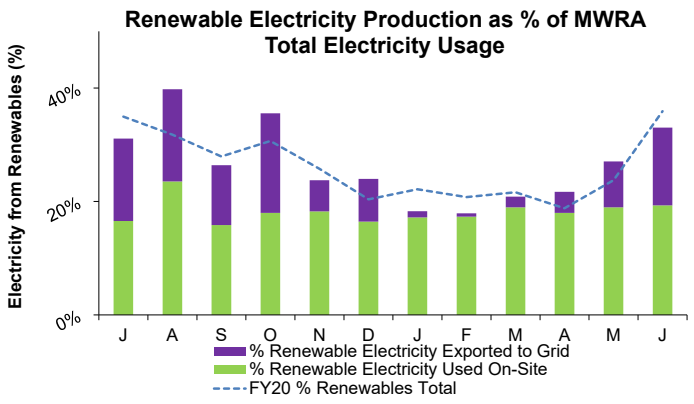


In Quarter 4 of FY21, the renewable energy produced from all solar PV systems totaled 481 MWh; 7% above budget[3]. The total savings and revenue[2] to date in FY21 (actuals through April[1]) is $126,821 10% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



In Quarter 4 of FY21, the renewable energy produced from all steam turbine generators totaled 6,852 MWh; 13% below budget[3]. The total savings and revenue[2] to date in FY21 (actuals through April[1]) is $2,055,103, 21% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



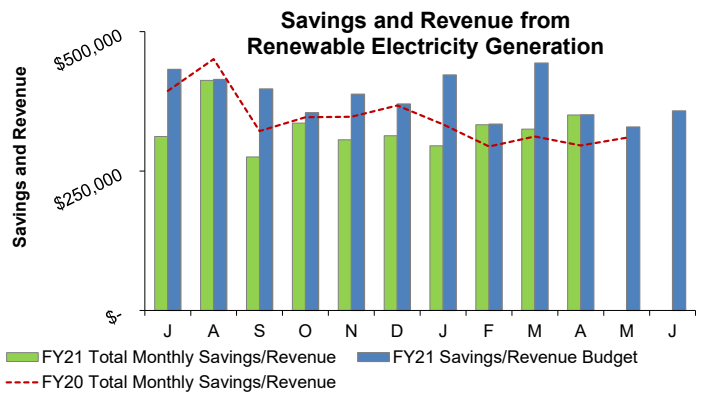


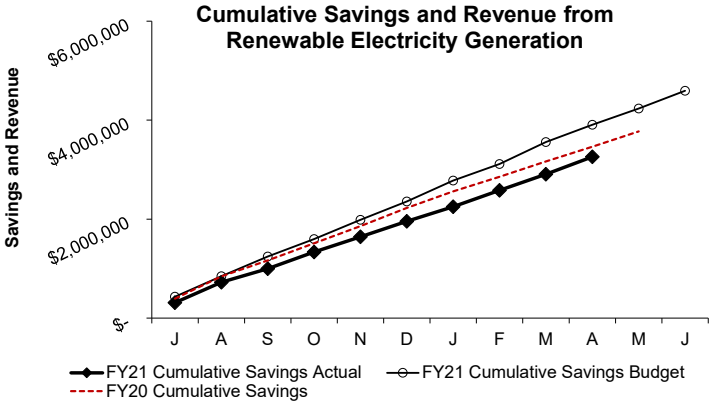
In Quarter 4 of FY 21, MWRA's electricity generation by renewable resources totaled 14,866 MWh, 8% above budget. MWRA's total electricity usage was approximately 48,773 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site at these facilities. Approximately 99% of FOD electrical accounts are accounted for by actual billing statements; minor accounts that are not tracked on a monthly basis such as meters and cathodic protection systems are estimated based on this year's budget.
All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.

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

Renewable Electricity Generation: Savings and Revenue

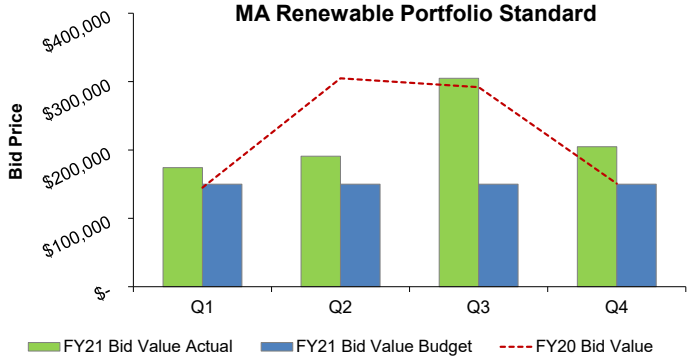
4th Quarter - FY21

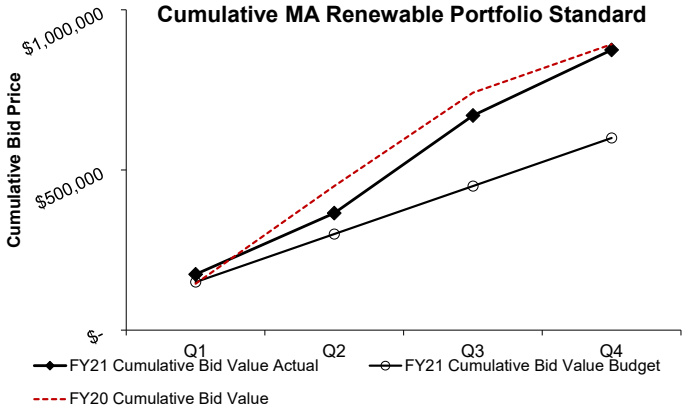




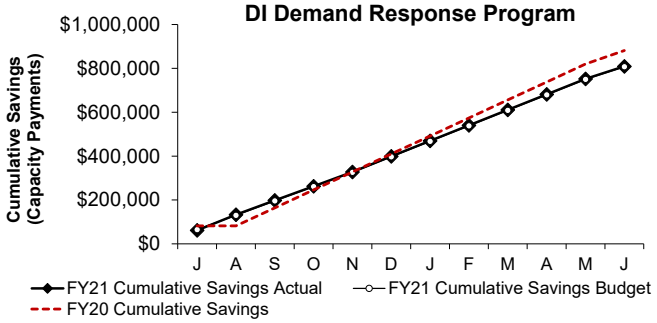
Savings and revenue from MWRA renewable electricity generation in the first 10 months of FY21 (actuals only through April) is $3,258,213 which is 17% below the budget[3].

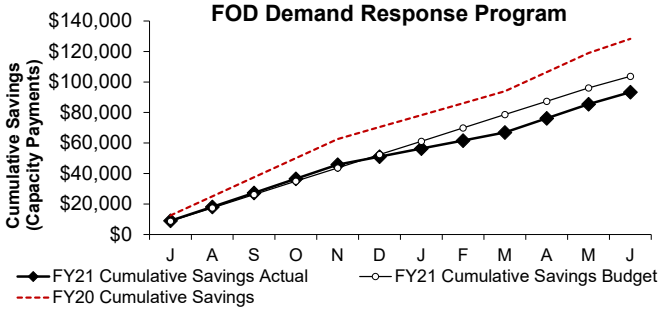
Savings and revenue[2] from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).
The use of DITP digester gas as a fuel source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





Bids were awarded during the 4th Quarter[1] from MWRA's renewable energy assets; 3,512 Q4 CY2020 Class I Renewable Energy Certificates (RECs) , 1,850 Class II RECs, and 39 Q4 CY2020 Solar RECs were sold for a total value of $204,771 RPS revenue; which is 37% 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.



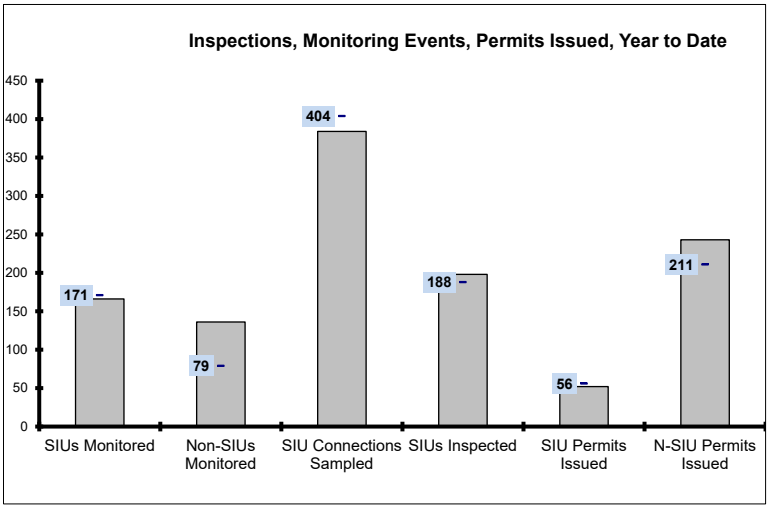


Currently Deer Island, JCWTP, Loring Rd, and Brutsch participate in the ISO-New England Demand Response Programs[4]. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY21 Cumulative savings (Capacity Payments only) through June[1] total $809,267 for DI and $93,324 for FOD through June[1].

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

Toxic Reduction and Control

4th Quarter - FY21



EPA Required SIU Monitoring Events
for FY20: 171
YTD : **166**

Required Non-SIU Monitoring Events
for FY20: 79
YTD : **136**

SIU Connections to be Sampled
For FY20: 404
YTD: **384**

EPA Required SIU Inspections
for FY20: 188
YTD: **198**

SIU Permits due to Expire
In FY20: 56
YTD: **52**

Non-SIU Permits due to Expire
for FY20: 211
YTD: **243**

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.

Throughout FY21, TRAC continued to see impacts to our permitted universe due to the COVID pandemic. Impacts included industry closures and changes to business practices that directly impact the industrial discharge.

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	4	0	4	0	3	1	11
Aug	2	15	0	1	0	1	2	17
Sep	1	20	0	3	0	1	1	24
Oct	2	15	0	1	0	2	2	18
Nov	2	17	0	1	0	1	2	19
Dec	3	9	0	0	0	1	3	10
Jan	5	12	1	2	0	1	6	15
Feb	0	11	1	1	0	0	1	12
Mar	5	15	0	2	0	3	5	20
Apr	0	6	0	3	0	0	0	9
May	4	18	0	2	0	2	4	22
Jun	24	54	1	4	0	8	25	66
% YTD	94%	81%	6%	10%	0%	9%	52	243

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. This month brings to an end the MWRA fiscal year, FY21.

In the fourth quarter, 126 permits were issued, 29 of which were SIUs. Twenty-eight of the SIU permits were issued within the 120-day timeframe. There were 97 non-SIU permits issued. Of the 97 Non-SIU permits issued in the quarter, 19 were issued late.

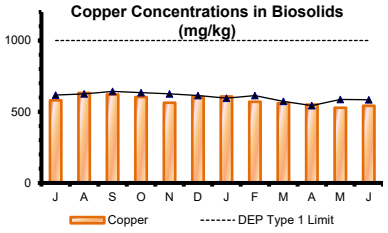
The reasons for late issuances include: waiting for critical data needed for permit processing; project delays and/or COVID related delays mainly in hotel operations, new start-ups, septage hauling and construction dewatering. Some of these translated to late payment of the relevant permit charges and hence, permits issued late.

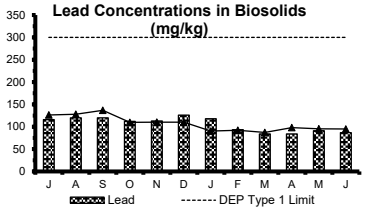
For the Clinton Sewer Service area, three SIU permits were issued in the fourth quarter of the fiscal year.

During FY21, nine SIUs changed status from SIU to Non-SIU or went out of business. As a result, the universe of SIU permits available for issuance during FY21 was smaller than initially projected (less that 50 SIU permits were available for renewal).

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

TRAC did not complete the monitoring goal because three industries did not discharge during the year and three industries went out of business before TRAC could sample their discharge. The remainder of TRAC's goals were completed.





Copper, lead, and molybdenum are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer.

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

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

Field Operations Highlights

4th Quarter – FY21

These two pages provide a partial snapshot of activities in the water and wastewater field operations.

Western Water Operations and Maintenance

- Wachusett Aqueduct Pump Station Testing: Staff activated the Wachusett Aqueduct to send water to WAPS for testing over four days in May Six of seven pumps were tested successfully sending water out the surge relief tower and into the forebay. Electrical repairs have been made to the seventh pump and now all 7 pumps are available for service if needed, providing redundancy to the Cosgrove tunnel.

- Brutsch Water Treatment Facility: SCADA was completed in June. Operations, maintenance, and valve crew support were needed to complete the upgrade, which was performed due to pending obsolescence. It allowed for implementing updated control system standards, ensuring future reliability, improving cyber security measures, and enhanced maintenance features.

- Norumbega Covered Storage Tank Cell 2: Staff successfully isolated cell 2 at Norumbega in May and performed a test of the dewatering system, to finalize the project requirements to completely dewater the cell and clean the tank floor. Cell 2 tank cleaning is expected to take place in 2022.

Metro Water Operations and Maintenance

- Water Pipeline Program: Staff completed four Blow-Off Retrofit projects during the quarter. One on Section 78 in Brookline, one on Section 70 in Melrose and two on Section 95 in Brookline. Work continued on repairing the Watertown Section in Waltham, a 24-inch high-density polyethylene (HDPE) pipe. Three sites were excavated allowing work on three mechanical couplings and a fourth allowing work at a transition coupling. Additional work during the month included excavating and shoring to support a valve repair on Section 70, and preparing Lee Street in Brookline for final paving after a major water main break. Leak detection was performed on over 51 miles of MWRA water main and assistance was provided to eight customer communities.

Operations Engineering

- Staff continued providing management and coordinating with Arcadis to support design and bidding efforts on the Carroll Water Treatment Plant control system upgrade.

Staff continued community assistance as needed:

- Newton System, installed pressure recorders and reviewed data to determine possible closed valve(s)
- Staff supported the planning for possible Wayland and Natick emergency connections to MWRA due to local PFAS contamination, and developed operational plans for the isolation and dewater of the Hultman for the installation of a valve at the Rte30 Hultman connection.

- Staff continued to manage 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.

Wastewater Operations & Maintenance

- Remote Headworks Upgrades: Wastewater Operations staff continued to work with Engineering & Construction staff and the contractor on the Remote Headworks Upgrades Project. All channels are in service. Operations staff continued to attend training on the new systems.

- Nut Island Headworks Odor Control & HVAC Improvements: The contractor continued to perform work on the facility odor control system, replacement of the facility's four (4) emergency spillway gates and replacement of the facility boilers. Operations staff assisted with shutdowns of the odor control system on 6/8/21 and 6/10/21.

- Union Park CSO Facility Operation & Maintenance: Operations, Process Control and Procurement staff have begun the process of going out to bid and hiring a contractor for the Management, Operation and Maintenance of the Union Park CSO Facility.

- Prison Point – Planned Utility Power Outage: Eversource informed the MWRA that they had to perform maintenance to their electrical distribution system which would impact the Prison Point CSO Facility. This resulted in a five (5) day utility power outage to Prison Point, April 18 to 22. Eversource supplied a portable generator to the MWRA and the facility was powered by this portable generator for the duration of the outage. The portable generator was staffed 24/7 and fueled by the generator contractor. The work was completed with no operational impact.

Field Operations Highlights

4th Quarter – FY21

Metro Equipment and Facility Maintenance

- Belmont Pump Station: MWRA electricians change out the Variable Frequency Drive for pump #3.

- Commonwealth Ave Pump Station: The motor for the #1 pump failed. MWRA electricians and mechanics changed out the motor. The existing motor will be repaired and become the stations spare motor.

- Chelsea Maintenance Facility: HVAC technician's replace the Unit Heater in the electrical shop.

- Hayes Pump Station: Pump #1 was not pumping to capacity. MWRA mechanics removed the rotating assembly and replaced with a new assembly. The older assembly will be re-built and become the station spare.

- Nut Island Headworks: MWRA mechanics repaired the motor mounting bolts on #1 vortex.

- Commonwealth Ave. Pump Station: MWRA mechanics replaced the bearings for #3 pumping unit.

- Wastewater Facilities: MWRA electricians assisted construction with the final testing of the Towable Generator Project at Nut Island Headworks, Quincy Pump Station and Braintree/Weymouth Pump Station.

- Alewife Pump Station: MWRA electricians working with electrical vendor Infra-Red repaired the stations emergency generation switch gear.

- Chestnut Hill Underground Pump Station: A security audit was conducted at the facility. The lighting in the rear stair well was found to be deficient. MWRA electricians installed new light fixtures.

- IPS: MWRA mechanics completed an over haul of the #1 screening conveyor.

- Chelsea Maintenance Facility: MWRA HVAC Specialist working with Facilities and an outside rigging company replaced two Roof Top Units (RTU's) for the Maintenance Building.

Environmental Quality-Wastewater

- Ambient Monitoring: Monitoring consultants successfully conducted the April, May, and June water column surveys of the 2021 field season, and the annual flounder survey, under modifications imposed by COVID-19 Health and Safety guidelines. Results from the June water column survey triggered a Contingency Plan caution threshold because of high abundance at stations near the outfall of the algae responsible for red tide in New England waters. Completed reports on bay and harbor benthos, flounder, and the Massachusetts Bay model. Presentations on an upgraded water quality model made to a meeting of expert reviewers and to the May 11 OMSAP meeting led to consensus that the updated model can be used for permit-required modeling. MWRA summarized the 2020 monitoring findings available to date at the May 11 OMSAP meeting. OMSAP, regulators, and representatives of the public present commended MWRA and its consultants for successfully continuing the monitoring and data analyses despite the challenges imposed by the COVID-19 pandemic.

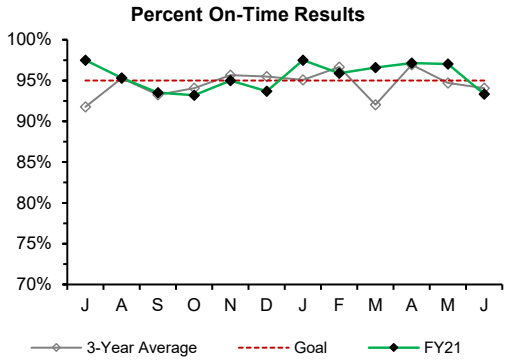
- Harbor/CSO Receiving Water Monitoring: Biweekly harbor wide and CSO receiving water monitoring continued with appropriate COVID-19 safety protocols.

- Permitting and Compliance Reporting: Staff submitted monthly and quarterly discharge monitoring reports and as-needed reports of blending and essential maintenance. Staff gathered information for upcoming NPDES permit applications.

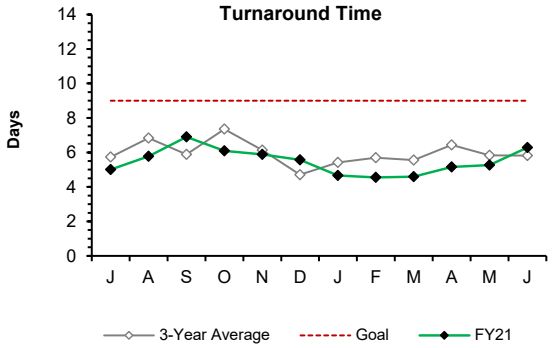
- Coordination with other MWRA Departments: Staff continued to work with Engineering & Construction and the DCOO on the receiving water quality analysis portion of the CSO Post-Construction Monitoring & Performance Assessment project. Staff participated in interdepartmental Data Users/Data Quality Team. Staff coordinated installation of CSO Variance required informational signs along Alewife Brook and Mystic River.

- Cooperation with other agencies: Staff participated in Massachusetts Bays Partnership meetings (Management Committee, Science/Technical Advisory subcommittee, Boston Harbor Ecosystem Network). Staff participated in stakeholder meetings held by MassDEP to provide input for regulations implementing CSO notification law. Staff met with Charles and Mystic River watershed associations to discuss CSO program.

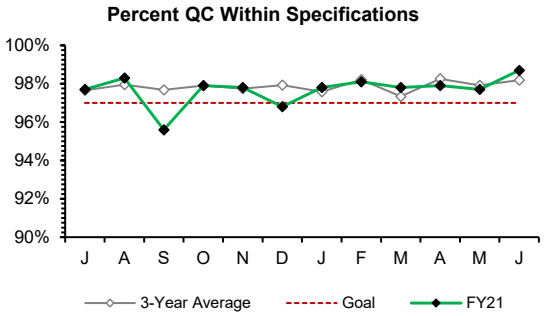
Laboratory Services
4th Quarter - FY21



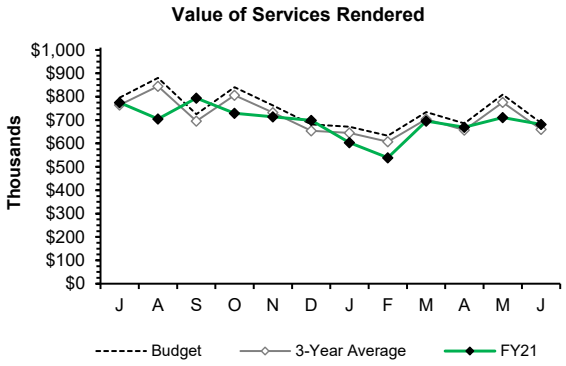
The Percent On-Time measurement met the 95% goal for FY21.



Turnaround Time met the 9-day goal.



Percent of QC tests meeting specifications met the 97% goal for FY21.



Value of Services Rendered finished Fy21 slightly below the annual budget projection.

Highlights:

Performance: FY21 average Turnaround Time, Percent on time and Percent QC within Specification all met targets. Value of Services Rendered fell slightly slightly below the three year average.

School Lead Program: MWRA's lab completed 968 lead and copper tests from 78 schools and childcare facilities in 26 communities during FY21. An additional 104 lead tests were completed in support of DPH investigations of exposed children in FY21. Since 2016, MWRA's Laboratory has conducted over 38,800 tests from 511 schools and daycares in 44 communities.

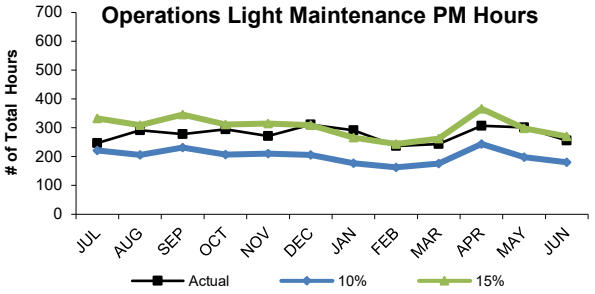
COVID-19 Testing: The wastewater pilot project continued throughout FY21. Sample results are posted on MWRA.com as they are received.

CONSTRUCTION PROGRAMS

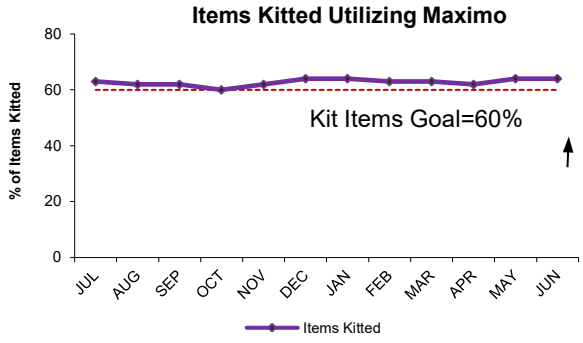
Field Operations' Metropolitan Equipment & Facility Maintenance

4th Quarter - FY21

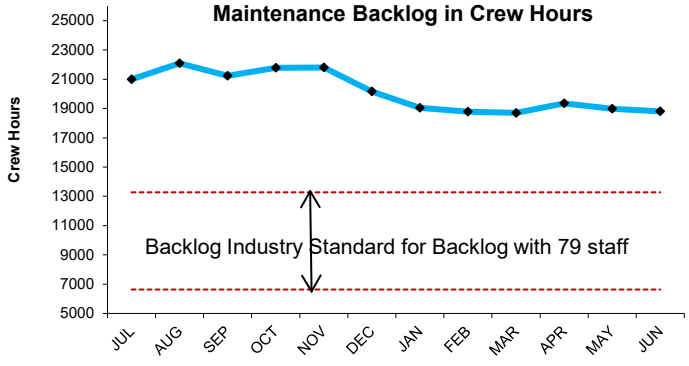
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



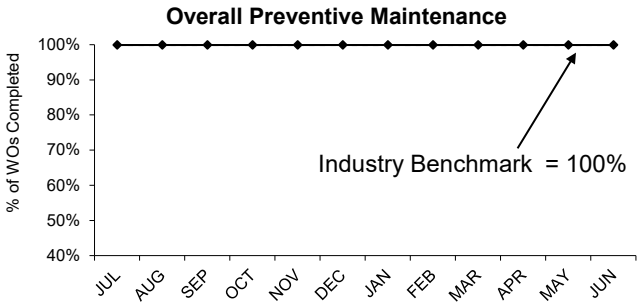
Operations staff averaged 288 hours per month of preventive maintenance during the 4th Quarter of FY21, an average of 14% of the total PM hours for the 4th Quarter, which is within the industry benchmark of 10% to 15%.



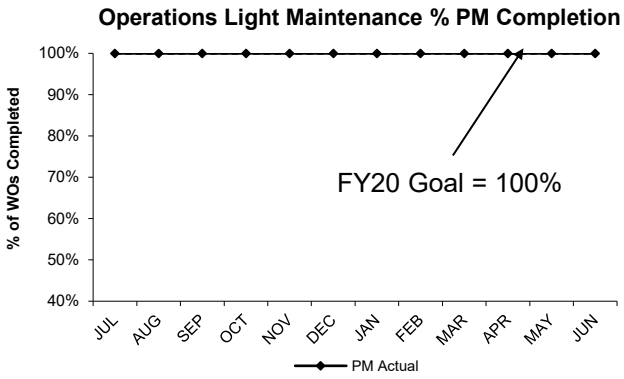
Operations' FY21 maintenance kitting goal has been set at 60% of all work orders to be kitted. Kitting is the staging of parts or material neccesary to complete maintenance work. In the 4th Quarter of FY21, 63% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



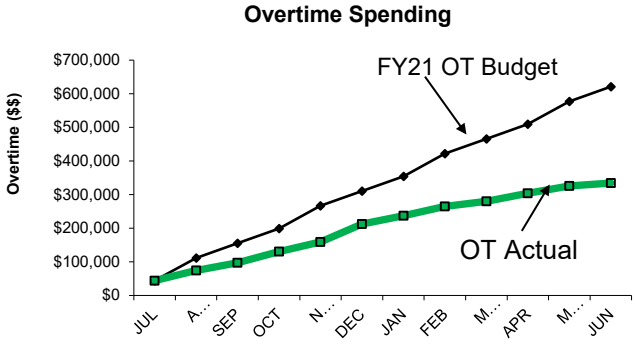
The 4th Quarter of FY21 backlog average is 19,050 hours. Management's goal is to continue to control overtime and try to get back within the industry benchmark of 6,636 to 13,275 hours. The increase is due to the previous reduction in staffing levels due to COVID19.



The Field Operations Department (FOD) preventive maintenance goal for FY21 is 100% of all PM work orders. Staff completed 100% of all PM work orders in the 4th Quarter of FY21.

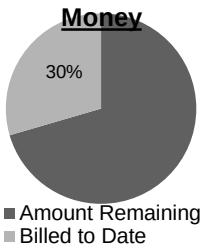


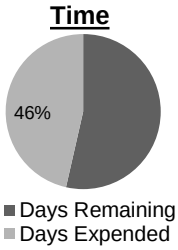
Wastewater Operations complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY21 PM goal is completion of 100% of all PM work orders assigned. Operations completed 100% of PM work orders in the 4th Quarter of FY21.



Maintenance overtime was $33,630 under budget on average, per month, for the 4th Quarter of FY21. Overtime was used for critical maintenance repairs and wet weather events. The overtime budget for FY21 was $621,114 and we were $287,756 under budget for the fiscal year.

Projects In Construction
4th Quarter – FY21





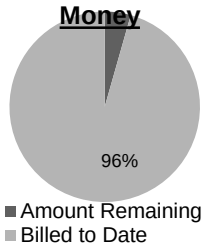
Permanent Metering Replacement and Installation

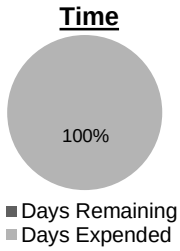
Project Summary: This project consists of the replacement of new installation of 174 flow meters in sewer manholes located throughout the MWRA service district.

Contract Amount: $3,286,114 *Contract Duration:* 450 Days

Notice to Proceed: 3-Dec-20 *Contract Completion:* 26-Feb-22

Status and Issues: As of June, the Contractor has installed 59 meters. The meter confirmations are up to date.





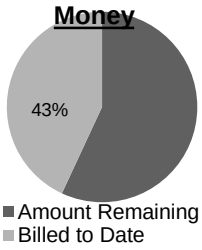
Chelsea Creek Headworks Upgrade

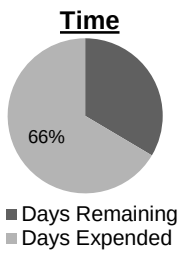
Project Summary: This project involves a major upgrade to the entire facility including: automation of screening collection & solids conveyance, replacement of the odor control, HVAC and electrical systems.

Contract Amount: $85,153,789.06 *Contract Duration:* 1,594 Days

Notice to Proceed: 22-Nov-16 *Contract Completion:* 4-Apr-21

Status and Issues: As of June, the Contractor installed firestopping throughout the Headworks, worked on caulking interior walls, they Installed caulking at the Channel 1 influent shaft covers in the Lounge and worked on caulking external doors, windows and louvers. In addition, they continued modernization of the freight elevator and worked on painting the elevator car support beams.





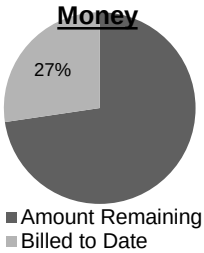
Dorchester Interceptor Sewer

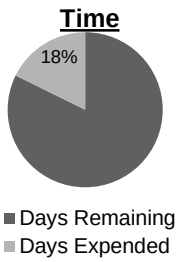
Project Summary: MWRA's Dorchester Interceptor conveys flows to MWRA's Columbus Park Connection and Headworks in South Boston

Contract Amount: $4,707,485 *Contract Duration:* 540 Days

Notice to Proceed: 6-Jul-20 *Contract Completion:* 29-Dec-21

Status and Issues: As of June, the Contractor completed water cured inversion No. 5 between SMH 172+90 and SMH 167+81; No. 4 between 172+90 to 179+72; No. 15 across Granite Ave SMH 130+93 to SMH 128+18. In addition, a 2 man, manhole rehabilitation crew was mobilized to repair leaks and epoxy coat SMH's through the DCR property on Adams Street.





Rehabilitation of WASM 3

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

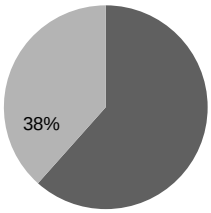
Contract Amount: $19,537,850.00 *Contract* Duration: 1,383 Days

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

Status and Issues: As of June, the Contractor set up an irrigation system to water the DCR property, after which they will continue to irrigate the hydroseed on the DCR property.

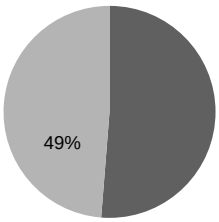
Projects In Construction
4th Quarter – FY21

Money



Amount Remaining
Billed to Date

Time



Days Remaining
Days Expended

Nut Island Odor Control and HVAC

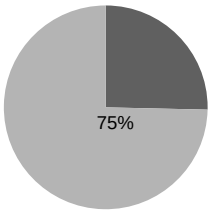
Project Summary: This project will provide upgrades to the odor control system, heating, ventilation and air conditioning system and other equipment.

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

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

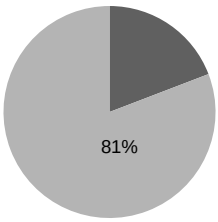
Status and Issues: As of June, the Contractor backfilled and compacted chemical feed pipes to chemical fill station. Formed, installed rebar, and placed concrete for equipment pad for new chemical fill station. Backfilled and compacted equipment pad and reset fence and fence posts plumb and level.

Money



Amount Remaining
Billed to Date

Time



Days Remaining
Days Expended

Chemical Tank Relining & Pipe Replacement

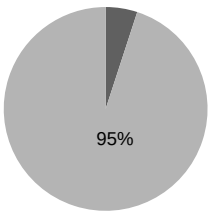
Project Summary: This project involves replacing the chlorobutyl rubber linings in 3 sodium hypochlorite and 2 sodium bisulfite storage tanks and assorted gravity thickener overflow piping at Deer Island.

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

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

Status and Issues: During June, the Contractor completed weld repairs of Sodium Hypochlorite Tank No. 2; inspected Sodium Bisulfite Tank No. 2 after lining removal. They performed nozzle and weld repairs and completed the installation of overflow pipe for Gravity Thickener No. 2.

Money



Amount Remaining
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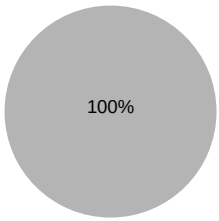


Days Remaining
Days Expended

Winthrop Terminal VFD and Motor

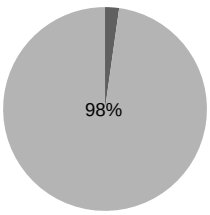
Project Summary: This project involves the replacement of 6, 600-HP motors, VFDs and associated electrical components in the Winthrop Terminal Facility.

Contract Amount: $11,950,754 *Contract Duration:* 1,549 Days

Notice to Proceed: 16-Jun-16 *Contract Completion:* 12-Sep-20

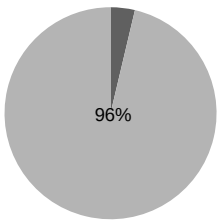
Status and Issues: As of June, the Contractor achieved substantial completion and began working on punchlist items.

Money



Amount Remaining
Billed to Date

Time



Days Remaining
Days Expended

Gravity Thickener Rehabilitation

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

Contract Amount: $19,979,541.22 *Contract Duration:* 1,190 Days

Notice to Proceed: 11-May-18 *Contract Completion:* 13-Aug-21

Status and Issues: As of June, the Contractor completed valve replacements in Gallery A5, below the DiStor and on top of the DiStor. The nitrogen purge and leaking coupling repair of DiStor 1 is on hold due to a 24" dewatering line in need of repair. DiStor 1 is full of water and needs to be drained through the 24" dewatering line.

CSO CONTROL PROGRAM

4th Quarter – FY21

All 35 projects in the CSO Long-Term Control Plan (LTCP) were complete as of December 2015 in compliance with milestones in the Federal District Court Order. MWRA is conducting a multi-year CSO post-construction monitoring program and performance assessment that will culminate in a report to EPA and DEP in December 2021 verifying whether the court-ordered LTCP levels of CSO control are attained. Of the $912.5 million budget in the FY21 CIP for the CSO Control Program, **approximately $5.8 million remain to be spent**, as described below.

Project/Item	Status as of June 30, 2021
BWSC Dorchester Interceptor Inflow Removal	This agreement with BWSC provided up to $3.76 million in MWRA financial assistance for reimbursement of the eligible costs of construction to remove inflow from the BWSC's Dorchester Interceptor system. BWSC awarded one construction contract for inflow removal in the amount of $1.58 million. **BWSC completed the contract work on June 30, 2021, when the financial assistance agreement ended. $2.18 million of remaining funds in the Dorchester agreement has been transferred into a new agreement by which BWSC will construct sewer separation and other CSO improvements in East Boston (see below).**
BWSC East Boston Sewer Separation and other CSO Improvements	**On April 14, 2021, the MWRA Board of Directors authorized the East Boston CSO financial assistance agreement in the amount of $2.18 million for a term of two years, from July 1, 2021 through June 30, 2023. BWSC and MWRA executed the agreement on June 10, 2021. BWSC has awarded East Boston Sewer Separation Contract 3 and is finalizing design of an upgraded connection to the MWRA system to lower CSO discharges at Outfall BOS014.**
City of Cambridge Memorandum of Understanding and Financial Assistance Agreement	The City of Cambridge attained substantial completion of its last MWRA CSO plan project in December 2015 in compliance with Schedule Seven. The $100.2 million MOU/FAA by which MWRA funded the eligible costs of the Cambridge-implemented CSO projects ended on June 30, 2018. MWRA recently completed final eligibility review of the Cambridge construction contracts and expects to issue a final eligibility certification **this summer**.
City of Somerville Financial Assistance Agreement	By this agreement, MWRA will provide up to $1.4 million upon construction award of City of Somerville's repair of its combined sewer trunk line upstream of the Somerville Marginal CSO Facility. Pursuant to the agreement, the repair work is intended to maintain the full in-system storage capacity of the trunk sewer to support CSO control. Somerville is finalizing design and expects to award the construction contract in the fall of 2021.
MWRA CSO Performance Assessment – Contract 7572	MWRA issued the Notice to Proceed with the contract for CSO Post-Construction Monitoring and Performance Assessment to AECOM Technical Services, Inc., in November 2017. The contract includes CSO inspections, overflow metering, hydraulic modeling, system performance assessments and water quality impact assessments, culminating in the submission of a report to EPA and DEP in December 2021 verifying whether the LTCP goals are attained. The current contract amount is $5.28 million **of which approximately $4.5 million has been spent**. On August 30, 2019, DEP issued five-year CSO variances to water quality standards for the Lower Charles River/Charles Basin and the Alewife Brook/Upper Mystic River effective through August 31, 2024. The variance conditions include receiving water quality modeling and CSO and stormwater sampling; the evaluation of certain additional CSO controls; other requirements intended to minimize CSO discharges, their impacts and public health risk; and preparation of updated CSO control plans for these waters. In compliance with the CSO variances, MWRA has implemented a subscriber-based system to notify the public of CSO discharges at its permitted outfalls within four hours of the start of discharge at each location, using meter readings. MWRA also reports estimated discharge volumes on its CSO notification web page. Cambridge and Somerville are also parties to the variances and have implemented notification systems for their own outfalls. · AECOM continues to make progress with CSO variance-required project evaluations and other site-specific investigations to mitigate CSO discharges at locations where LTCP goals are not yet attained. In these efforts, MWRA is maintaining close coordination with the CSO communities. CSO mitigation implemented in late 2020/early 2021 included: BWSC completed its East Boston sewer separation Contract 1, Chelsea raised the overflow weir at Outfall CHE004, Cambridge removed heavy sediments in the Outfall CAM401A system, and MWRA is designing a replacement for the interceptor connection at Outfall CHE008 - all expected to bring associated outfalls into attainment with LTCP discharge goals. In addition, Cambridge completed the partial sewer separation improvements that have reduced discharges from the Cottage Farm facility. **More recent work includes MWRA's ongoing design of a new interceptor connection at Chelsea's Outfall CHE008, replacement of a faulty tide gate in the Somerville Marginal Facility outfall, evaluations supporting a new interceptor connection upstream of the Somerville Marginal Facility, and evaluations to improve flow conveyance at Outfall BOS017 in Charlestown. BWSC continues with construction of East Boston sewer separation Contract 2, has awarded Contract 3, and also has commenced construction of South Boston sewer separation Contract 1 that will lower CSO discharges to Fort Point Channel.** · AECOM updated the MWRA hydraulic model to Q1-2021 system conditions in part to produce an updated Typical Year CSO performance assessment relative to the LTCP activation and volume goals. The updated assessment shows attainment of the goals at 70 of 86 discharge locations active in the late 1980's, including outfalls that have been closed. MWRA forecasts attainment at an additional six outfalls with scheduled completion after 2021 of recently recommended MWRA and community CSO improvements (many are mentioned above). At 10 discharge locations, MWRA and the CSO communities continue to identify and evaluate alternatives to further reduce discharges. · Utilizing receiving water quality models of the Lower Charles River and the Alewife Brook/Upper Mystic River AECOM completed and calibrated last fall, it performed water quality assessments of current river conditions and the impacts of remaining CSO and non-CSO (dry weather and stormwater) pollution sources. **MWRA distributed a draft Water Quality Assessment Report to EPA, DEP, the CSO communities, Charles River Watershed Association, and Mystic River Watershed Association and is addressing comments received.**

CIP Expenditures

4th Quarter – FY21

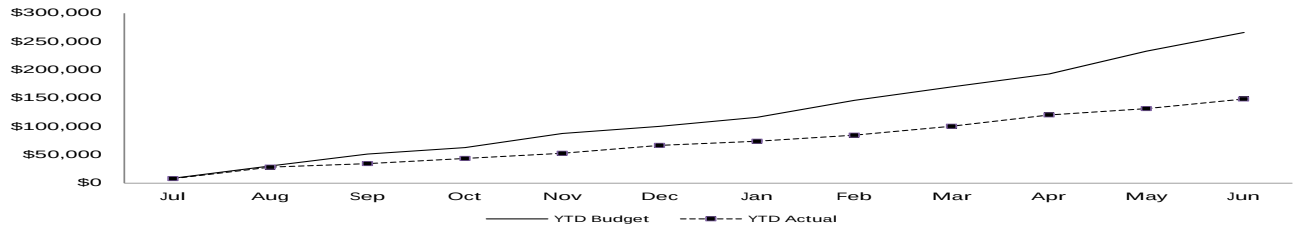
FY21 Capital Improvement Program Expenditure Variances through June by Program ($ in thousands)				
Program	FY21 Budget Through June	FY21 Actual Through June	Variance Amount	Variance Percent
Wastewater	$153,470	$98,560	($54,910)	-36%
Waterworks	$90,301	$45,592	($44,709)	-50%
Business and Operations Support	$22,003	$4,211	($17,792)	-81%
Total	$265,774	$148,363	($117,411)	-44%

Project underspending within Wastewater was due to updated schedules for the Prison Point CSO Rehabilitation, DI Primary & Secondary Clarifier Rehab, DI Motor Control Center and Switchgear Replacement Construction, and Remote Access Shaft Improvements, delay in award and software training for the Wastewater Metering contract, work was delayed, and time extension for the Chelsea Creek Headworks Upgrades, delays in equipment delivery, and Covid-19 shutdown for Nut Island Odor Control & HVAC Construction, updated final cost for Dorchester I/I Removal work, delay in award for Ward Street and Columbus Park Headworks Upgrades Design/CA, work anticipated in FY21 that was completed in FY20 for the Pellet Pipe Relocation and the Residuals Mechanical/Electrical/Dryer Drum Replacements, start-up delay for the Dorchester Interceptor Sewer, and timing of community repayments due to less than anticipated communities deferring their loan repayments for the I/I Local Financial Assistance program. This underspending was partially offset by contractor progress for the Winthrop Terminal Facility (WTF) VFD Replacement, and DI Gravity Thickener Rehab contracts. Project underspending in Waterworks was due to timing of community repayments due to less than anticipated communities deferring their loan repayments for the Water Loan program, updated schedules for Section 89 & 29 Replacement, CP-3 Sections 23, 24, and 47 Rehab, and CWTP SCADA Upgrades, timing of consultant work for the Tunnel Preliminary Design & MEPA Review, timing of final work and balancing credit change order for SEH Section 111 Construction 3, and delay in award and repair clamps issue for CP-1 Shafts 6, 8, and 9A. This underspending was partially offset by contractor progress for WASM 3 CP-1, Commonwealth Avenue Pumping Station Rehab, SEH Section 111 Construction 2, and consultant progress for Section 56 Repl./Saugus River Design/CA.

Budget vs. Actual CIP Expenditures

($ in thousands)

Total FY21 CIP Budget of $265,774



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 6/30/21	$228.0 million
Unused capacity under the debt cap:	$1.65 billion
Estimated date for exhausting construction fund without new borrowing:	Apr-22
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding: Commercial paper capacity / Revolving Loan	$128 million $350 million
Budgeted FY21 Cash Flow Expectancy*:	$203 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

4th Quarter – FY21

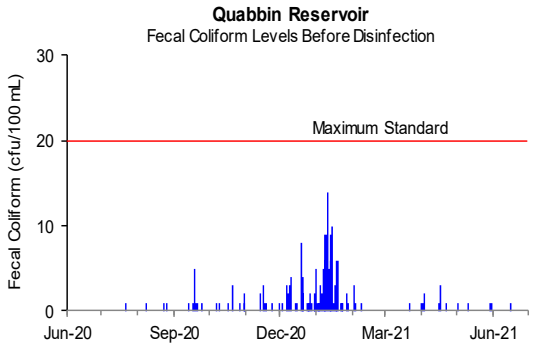
Source Water – Microbial Results

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

Sample Site: Quabbin Reservoir

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

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

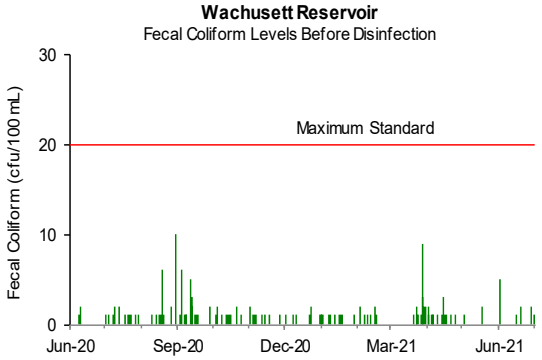


Sample Site: Wachusett Reservoir

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

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

All samples collected during the 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.**

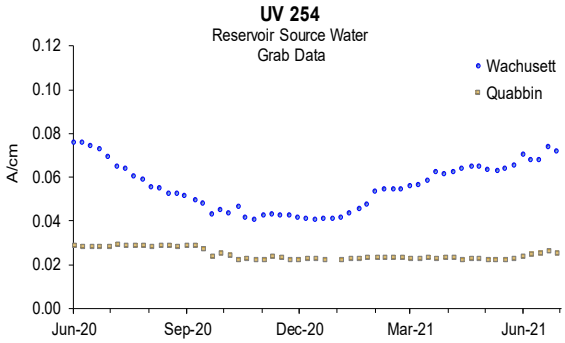


Source Water – UV Absorbance

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 0.066 A/cm for the quarter.



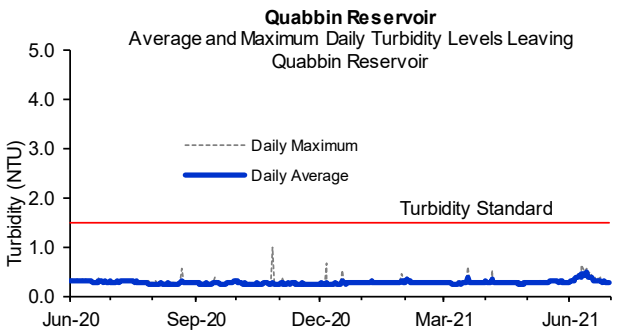
Source Water – Turbidity

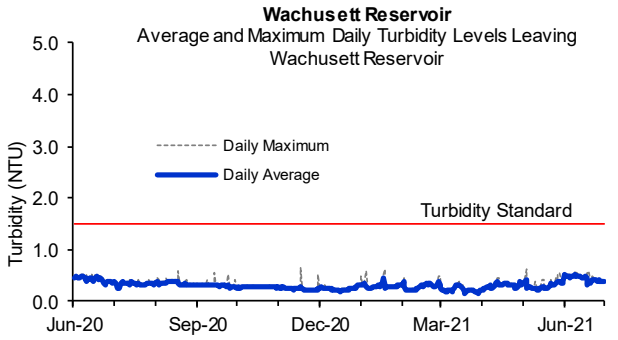
4th Quarter – FY21

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.



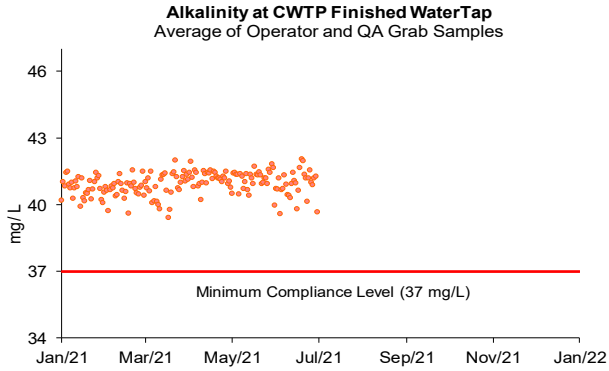


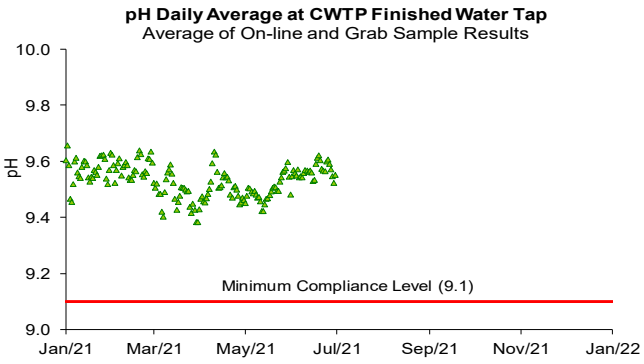
Treated Water – pH and Alkalinity Compliance

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 9.5 to 9.6 and alkalinity ranged from 40 to 42 mg/L. No sample results were below DEP limits for this quarter.





Treated Water – Disinfection Effectiveness

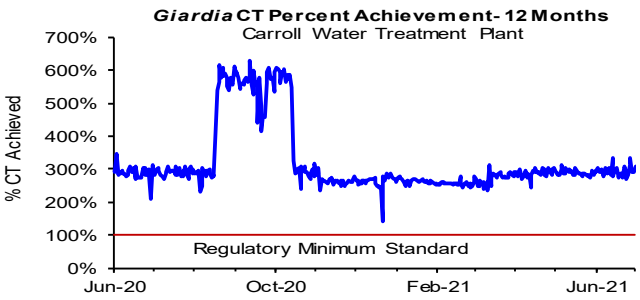
4th Quarter – FY21

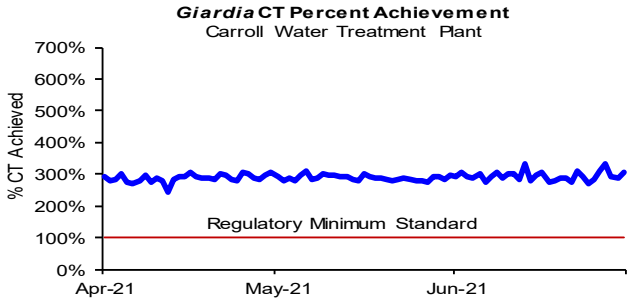
At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA calculates inactivation rates hourly and reports *Giardia* inactivation at maximum flow and *Cryptosporidium* inactivation at minimum UV dose. MWRA must meet 100% of required CT and IT.

CT achievement for *Giardia* assures CT achievement for viruses, which have a lower CT requirement. For *Cryptosporidium*, there is also an "off-spec" requirement. Off-spec water is water that has not reached the full required UV dose or if the UV reactor is operated outside its validated ranges. No more than 5% off-spec water is allowed in a month.

Wachusett Reservoir – MetroWest/Metro Boston Supply:

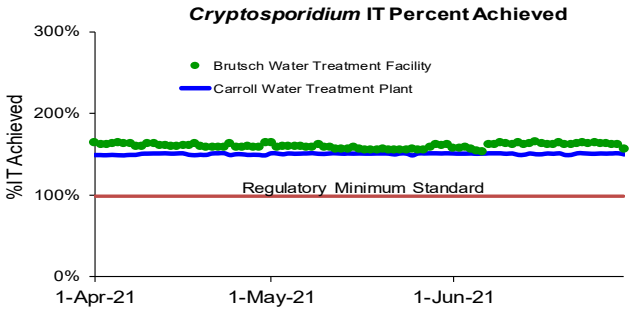
- Ozone dose at the CWTP varied between 1.9 to 2.8 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- *Cryptosporidium* IT was maintained above 100% for the quarter. Off-spec water was less than 5%.
- The ozone dose was proactively raised in 2020 from mid August to mid October in response to elevated reservoir total coliform levels. This is visible in the top left graph.
- The slight dip in Giardia CT Achievement on December 21, 2020 was due to Train B returning to service after undergoing winter maintenance. Giardia CT Achievement was met this day. This is visible in the top left graph.

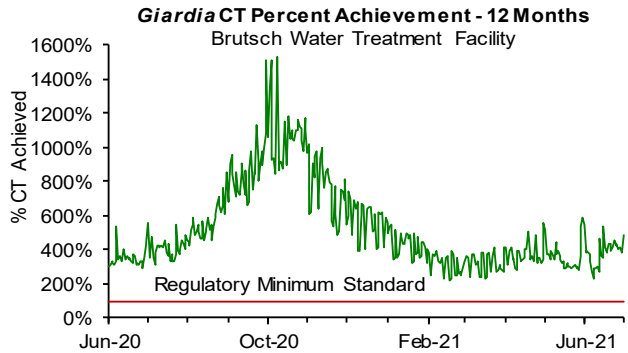


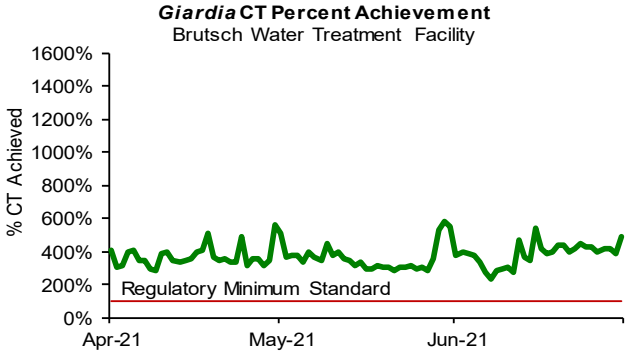


Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

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







Source Water - Algae

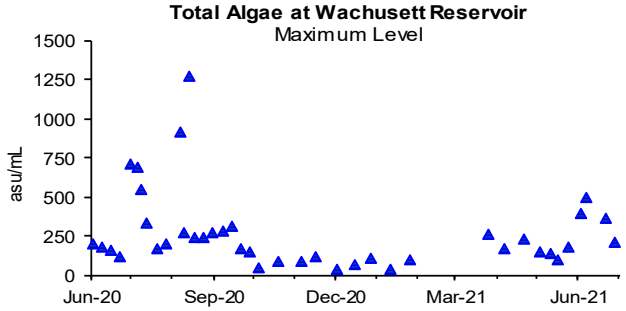
4th Quarter – FY21

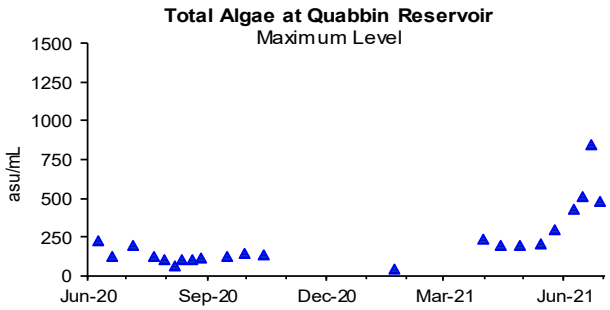
Algae levels in the Wachusett and Quabbin Reservoir are monitored by DCR and MWRA. These results, along with taste and odor complaints, are used to make decisions on source water treatment for algae control.

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 seven taste and odor complaints which may be related to algae reported from the local water departments.

In June, *Chrysosphaerella*, a taste and odor causing algae species, bloom occurred the Quabbin Reservoir. See the MWRA Press Release: https://www.mwra.com/01news/2021/061421-quabbinalgae.html.



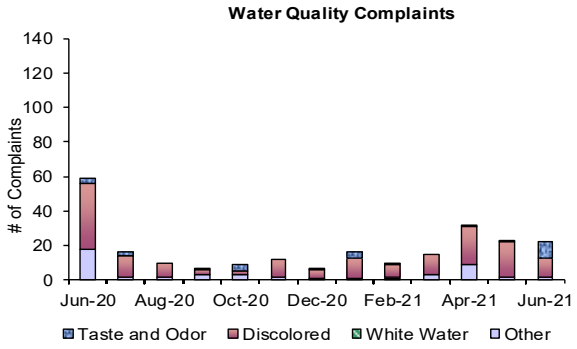


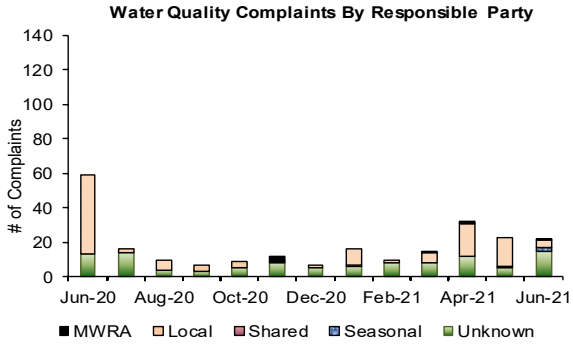
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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 77 complaints during the quarter compared to 85 complaints from 4th Quarter of FY20. Of these complaints, 53 were for "discolored water", 11 were for "taste and odor", and 13 were for "other". Of these complaints, 40 were local community issues, 2 were MWRA related, 1 was a shared MWRA/community issue, 2 were seasonal in nature, and 33 were unknown in origin.





Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

4th Quarter – FY21

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

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

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

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

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

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

Highlights

In the 4th Quarter, four of the 6,529 samples (0.06% system-wide) submitted to MWRA labs for analysis tested positive (South Hadley – May, Boston, Framingham, Peabody - June). One of the 1954 MWRA locations or Community/MWRA Shared samples (0.05%) tested positive for total coliform. No samples tested positive for *E.coli*. Only 0.1% of the Fully Served community samples had chlorine residuals lower than 0.2 mg/L for the quarter.

NOTES:

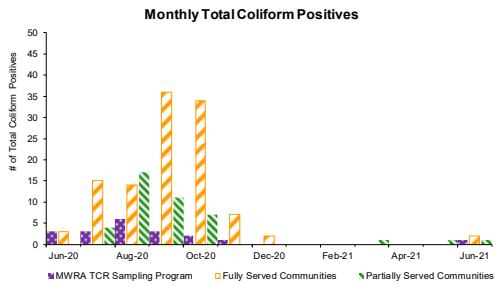
a) MWRA total coliform and chlorine residual results include data from community locations. In most cases these community results are indicative of MWRA water as it enters the community system; however, some are strongly influenced by local pipe conditions. Residuals in the MWRA system are typically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

e) Burlington sampling started June 2021.



			Total Coliform # Samples (b)	Total Coliform # (%) Positive	*E.coli* # Positive	Assessment Required
MWRA	a	MWRA Locations	399	1 (0.25%)	0	
		Shared Community/MWRA sites	1555	0 (0%)	0	
		Total: MWRA	1954	1 (0.05%)	0	No
Fully Served		ARLINGTON	169	0 (0%)	0	
		BELMONT	104	0 (0%)	0	
		BOSTON	783	1 (0.13%)	0	No
		BROOKLINE	223	0 (0%)	0	
		CHELSEA	169	0 (0%)	0	
		DEER ISLAND	52	0 (0%)	0	
		EVERETT	169	0 (0%)	0	
		FRAMINGHAM	240	1 (0.42%)	0	No
		LEXINGTON	118	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	276	0 (0%)	0	
		NORTHBOROUGH	48	0 (0%)	0	
		NORWOOD	99	0 (0%)	0	
		QUINCY	338	0 (0%)	0	
		READING	130	0 (0%)	0	
		REVERE	195	0 (0%)	0	
		SAUGUS	104	0 (0%)	0	
		SOMERVILLE	252	0 (0%)	0	
		SOUTHBOROUGH	30	0 (0%)	0	
		STONEHAM	91	0 (0%)	0	
		SWAMPSCOTT	57	0 (0%)	0	
		WALTHAM	216	0 (0%)	0	
		WATERTOWN	130	0 (0%)	0	
		WESTON	45	0 (0%)	0	
		WINTHROP	72	0 (0%)	0	
		Total: Fully Served	*5001*	*2 (0.04%)*		
Partially Served	c	BEDFORD	57	0 (0%)	0	
		BURLINGTON	24	0 (0%)	0	
		CANTON	90	0 (0%)	0	
		NEEDHAM	123	0 (0%)	0	
		PEABODY	209	1 (0.48%)	0	No
		WAKEFIELD	140	0 (0%)	0	
		WELLESLEY	114	0 (0%)	0	
		WILMINGTON	87	0 (0%)	0	
		WINCHESTER	91	0 (0%)	0	
		WOBURN	195	0 (0%)	0	
		Total: Partially Served	*1130*	*1 (0.09%)*		
CVA	d	MWRA CVA Locations	104	0 (0%)	0	
		CHICOPEE	186	0 (0%)	0	
		SOUTH HADLEY FD1	63	1 (1.59%)	0	No
		WILBRAHAM	45	0 (0%)	0	
		Total: CVA	*398*	*1 (0.25%)*		
		Total: Community Samples	*6529*	*4 (0.06%)*		

Chlorine Residuals in Fully Served Communities

	2020							2021					
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
% <0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1
% <0.2	0.4	0.5	0.4	1.0	1.1	1.4	0.4	0.2	0.1	0.0	0.0	0.0	0.2
% <0.5	1.5	2.2	2.9	4.1	5.1	3.7	2.5	1.9	0.8	0.2	0.3	0.2	0.6
% <1.0	4.3	6.5	8.4	10.7	12.2	9.3	5.3	3.6	2.5	1.5	2.0	1.0	2.1
% ≥1.0	95.7	93.6	91.6	89.4	87.8	90.7	94.7	96.5	97.6	98.5	98.0	99.0	97.9

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

4th Quarter – FY21

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

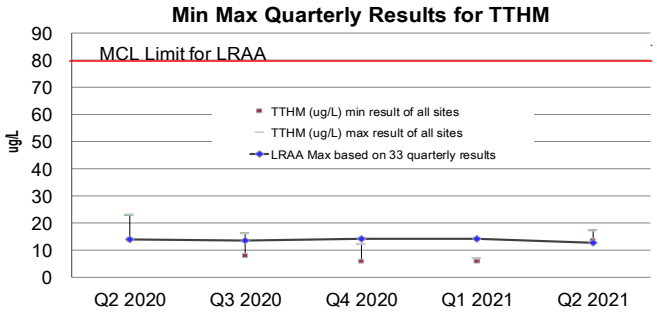
The locational running annual average calculated quarterly at each individual sampling location must be below the Total HAA5 or Total TTHM MCL standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

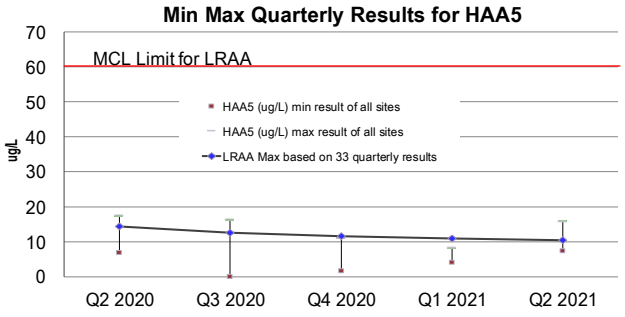
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines data for all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1). Each community is regulated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

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

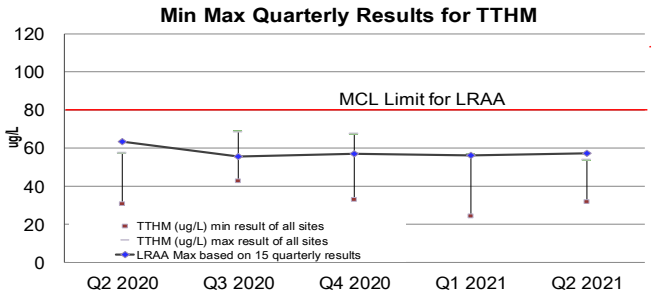
The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 14.7 ug/L; HAA5s = 10.5 ug/L. The current RAA for Bromate = 0.0 µg/L No LRAA exceedances or violations occurred this quarter for MetroBoston and any of the CVA communities. MWRA and the CVA communities continue to closely monitor and manage the disinfection process to minimize DBP production.

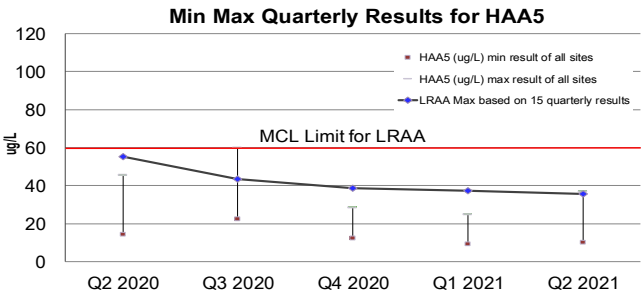
MetroBoston Disinfection By-Products





CVA Disinfection By-Products (Combined Results)





Water Supply and Source Water Management

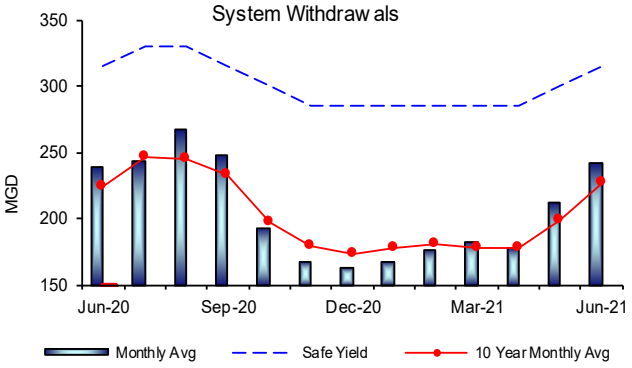
4th Quarter – FY21

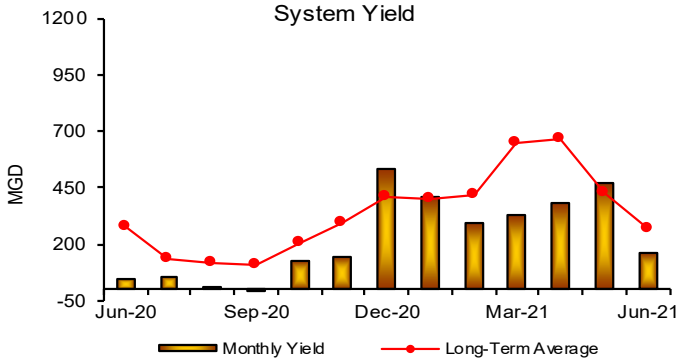
Background

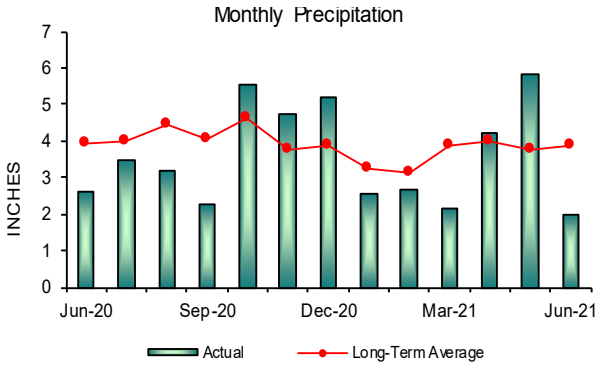
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir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

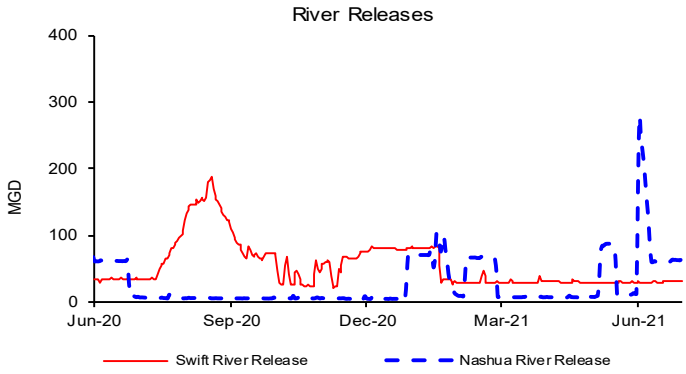
Outcome

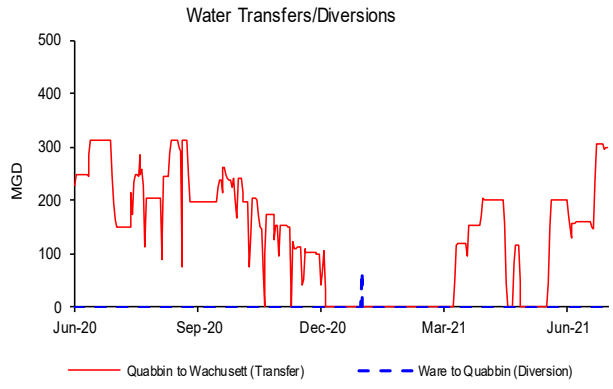
The volume of the Quabbin Reservoir was at 94.1% as of June 30, 2021; a 0.70 % increase for the quarter, which represents a gain of more than 2.7 billion gallons of storage and an increase in elevation of 0.37'. System withdrawal and precipitation for the quarter were above their long term averages. Yield for the quarter was below its long term quarterly average. Quabbin is in Normal Operating Range for this time of year.

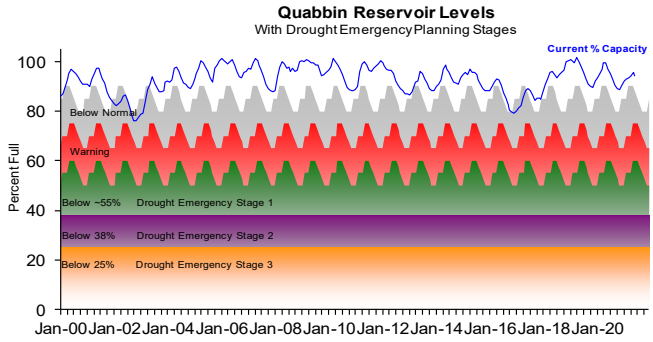












WASTEWATER QUALITY

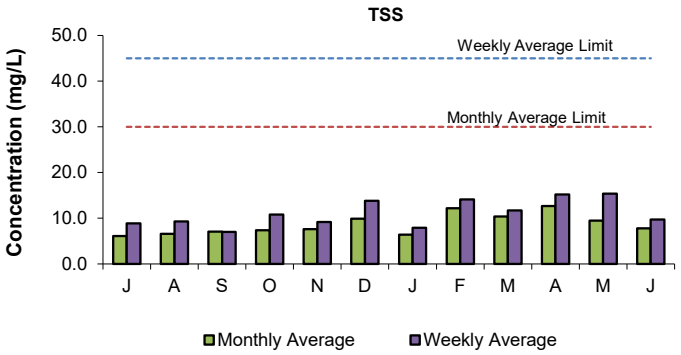
NPDES Permit Compliance: Deer Island Treatment Plant

4th Quarter - FY21

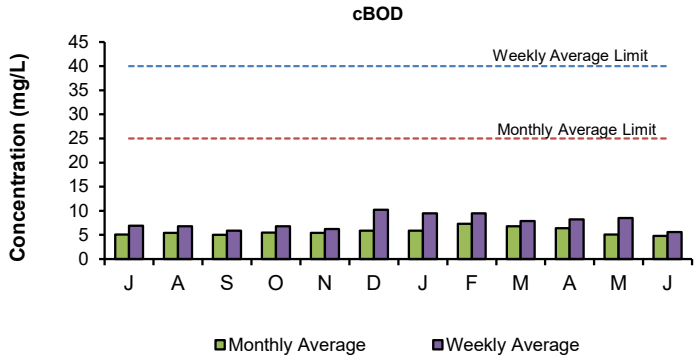
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*April*	*May*	*June*	*4th Quarter Violations*	*FY21 YTD Violations*
Dry Day Flow (365 Day Average):		mgd	436	260.4	257.8	262.0	0	0
cBOD:	Monthly Average	mg/L	25	6.4	5.1	4.8	0	0
	Weekly Average	mg/L	40	8.2	8.5	5.6	0	0
TSS:	Monthly Average	mg/L	30	12.7	9.5	7.8	0	0
	Weekly Average	mg/L	45	15.2	15.4	9.7	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	13.0	15.0	41.0	0	0
	Weekly Geometric Mean	col/100mL	14000	7.0	6.0	7.0	0	0
	% of Samples >14000	%	10	0.0	0.0	0.0	0	0
	Consecutive Samples >14000	#	3	0	0	0	0	0
pH:		SU	6.0-9.0	6.4-6.9	6.5-7.0	6.5-7	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	100	100	100	0	0
	Inland Silverside	%	≥1.5	100	100	100	0	0

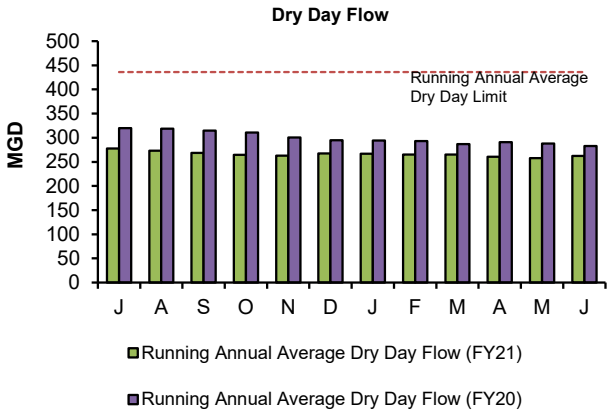
There have been no permit violations in FY21 to date at the Deer Island Treatment Plant (DITP).



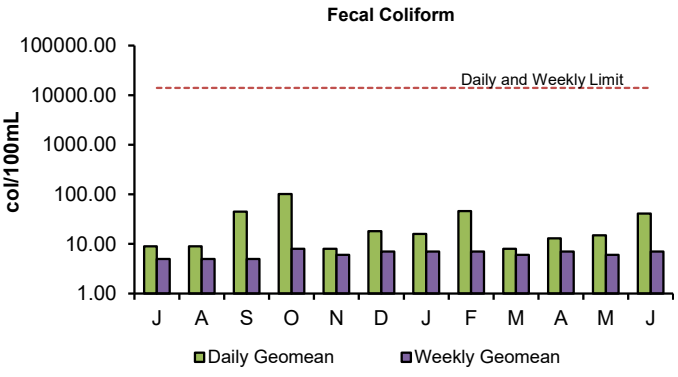
Total Suspended Solids (TSS) in the effluent is a measure of the amount of solids that remain suspended after treatment. All TSS measurements for the 4th Quarter were within permit limits.



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

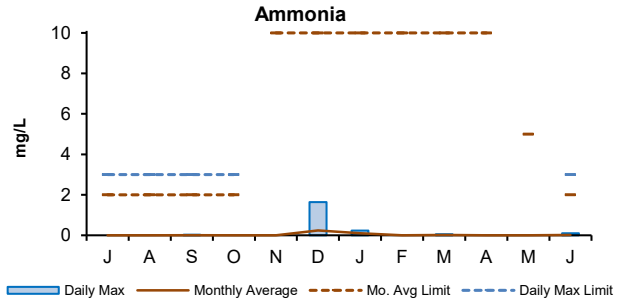
4th Quarter - FY21

NPDES Permit Limits

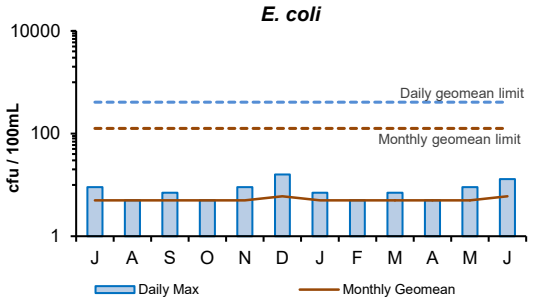
Effluent Characteristics		*Units*	*Limits*	*April*	*May*	*June*	*4th Quarter Violations*	*FY21 YTD Violations*
Flow:	12-month Rolling Average:	mgd	3.01	2.22	2.21	2.27	0	0
BOD:	Monthly Average:	mg/L	20	0.70	0.80	0.90	0	0
	Weekly Average:	mg/L	20	0.90	1.50	1.40	0	0
TSS:	Monthly Average:	mg/L	20	1.70	1.70	1.80	0	0
	Weekly Average:	mg/L	20	2.30	2.30	2.30	0	0
pH:		SU	6.5-8.3	7-7.6	7.1-7.7	7-7.6	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	9.40	9.00	8.60	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	5	5	6	0	0
	Daily Geometric Mean:	cfu/100mL	409	5	9	13	0	0
TCR:	Monthly Average:	ug/L	17.6	0.13	0.00	0.00	0	0
	Daily Maximum:	ug/L	30.4	4.00	0.00	0.00	0	0
Copper:	Monthly Average:	ug/L	11.6	8.94	8.57	7.66	0	0
	Daily Maximum:	ug/L	14.0	8.94	8.57	9.00	0	0
Total Ammonia Nitrogen: November 1st - March 31st	Monthly Average:	mg/L	10.0	0.00	0.00	0.02	0	0
	Daily Maximum:	mg/L	35.2	0.00	0.00	0.10	0	0
Total Phosphorus: November 1st - March 31st	Monthly Average:	ug/L	1000	49	40	48	0	0
	Daily Maximum:	ug/L	RPT	106	59	72	0	0
Acute Toxicity+:	Daily Minimum:	%	≥100	N/A	N/A	>100	0	0
Chronic Toxicity+:	Daily Minimum:	%	≥62.5	N/A	N/A	100	0	1

There has been one permit violation in FY21 at the Clinton Treatment Plant.
1st Quarter: There was one permit violation in the first quarter. The quarterly chronic toxicity result of 25% was below the minimum permit limit of 62.5%.
2nd Quarter: There were no permit violations in the 2nd Quarter.
3rd Quarter: There were no permit violations in the 3rd Quarter.
4th Quarter: There were no permit violations in the 4th Quarter.

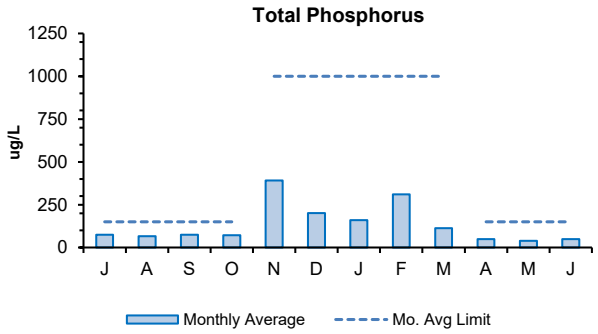
+ Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



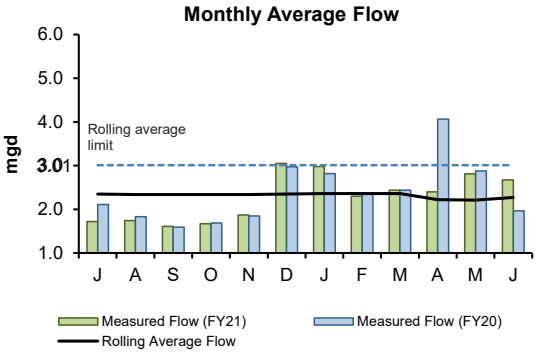
The 4th Quarter's monthly average and daily maximum concentrations of ammonia were below the permit limits. The monthly average and daily maximum limits for the 4th Quarter are 2.0 and 3.0 mg/L respectively. The permit limits are most stringent from June to October when warm weather conditions are most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



E. coli is an indicator for the possible presence of pathogens. There were no violations of permit limits in the 4th Quarter.The monthly and daily limits are 126 cfu/100 mL and 409 cfu/100 mL respectively.



Total phosphorus limits are most stringent during the growing season from April to October. The 4th Quarter's monthly average concentrations for total phosphorus were below permit limits.

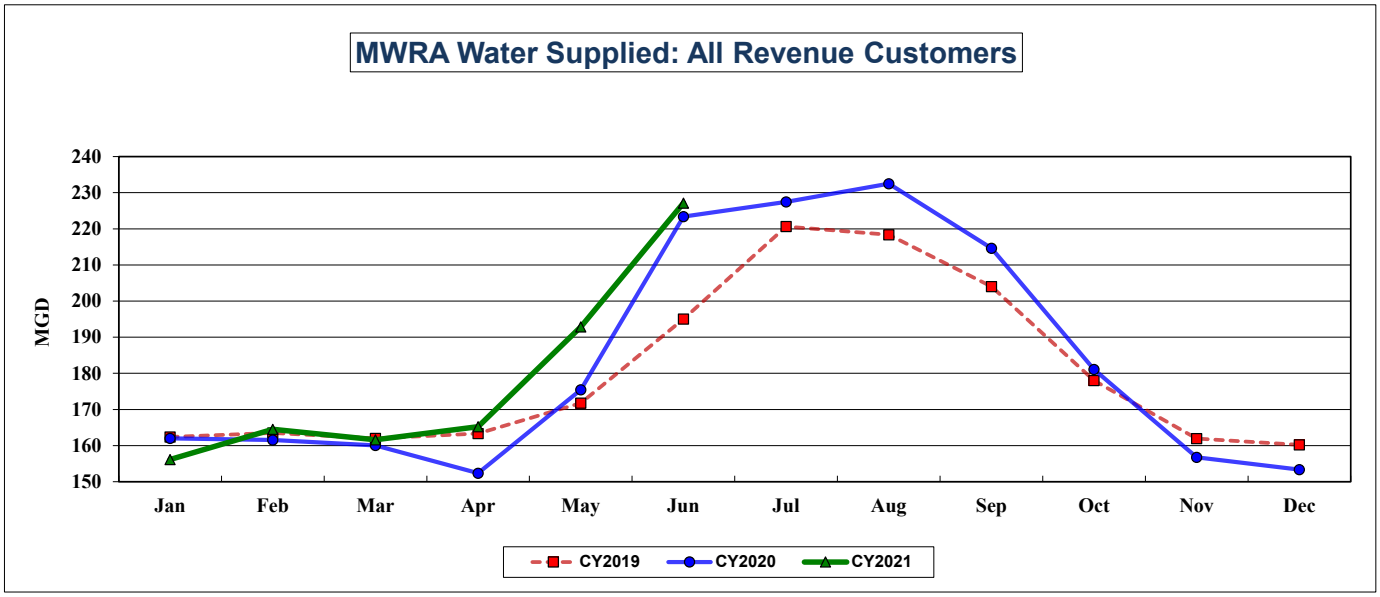


The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The 12-month rolling average flows during the 4th Quarter were below the permit limit.

COMMUNITY FLOWS AND PROGRAMS

Customer Water Use

4th Quarter - FY21



MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2019	162.367	163.492	161.984	163.350	171.773	195.025	220.621	218.376	203.996	177.998	161.941	160.207	169.662	180.220
CY2020	162.016	161.551	160.018	152.368	175.435	223.405	227.454	232.496	214.617	181.110	156.727	153.367	172.416	183.462
CY2021	156.148	164.513	161.615	165.219	192.854	227.139	0.000	0.000	0.000	0.000	0.000	0.000	177.935	177.935

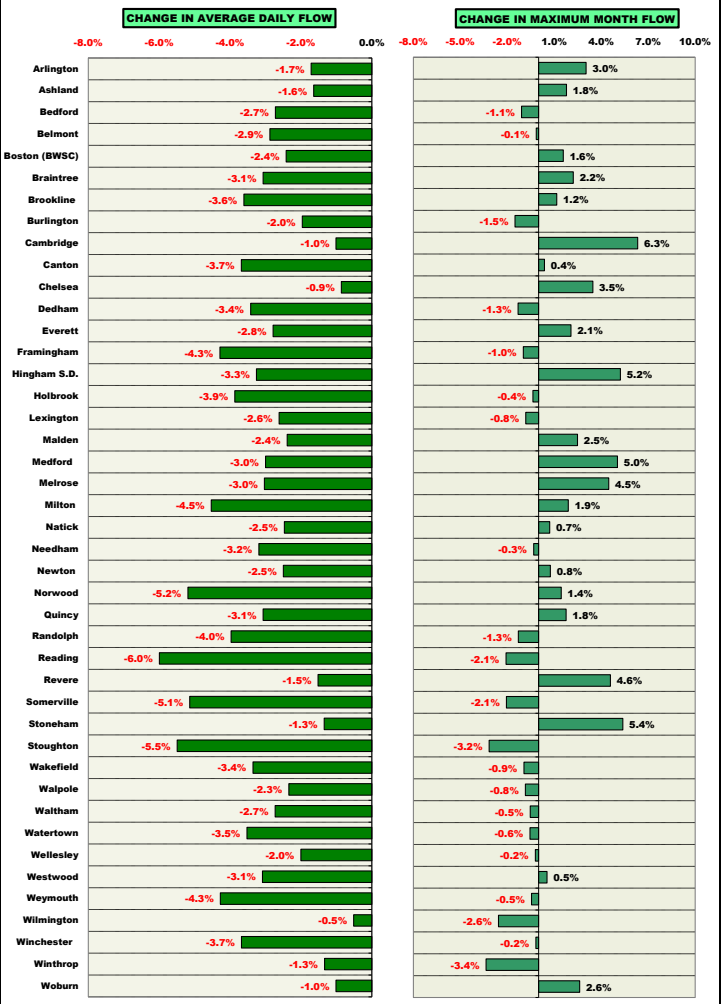
The June 2021 Community Water Use Report was recently distributed to communities served by the MWRA Metropolitan and Chicopee Valley waterworks systems. Each community's annual water use relative to the system as a whole is the primary factor in allocating the annual water rate revenue requirement to MWRA water communities. Calendar year 2021 water use will be used to allocate the FY2023 water utility rate revenue requirement.

MWRA customers used an average of 195.1 mgd in the 4th quarter (Apr-Jun 2021) of FY2021. This is an increase of 11.3 mgd or 6.2% compared to the 4th quarter of FY2020.

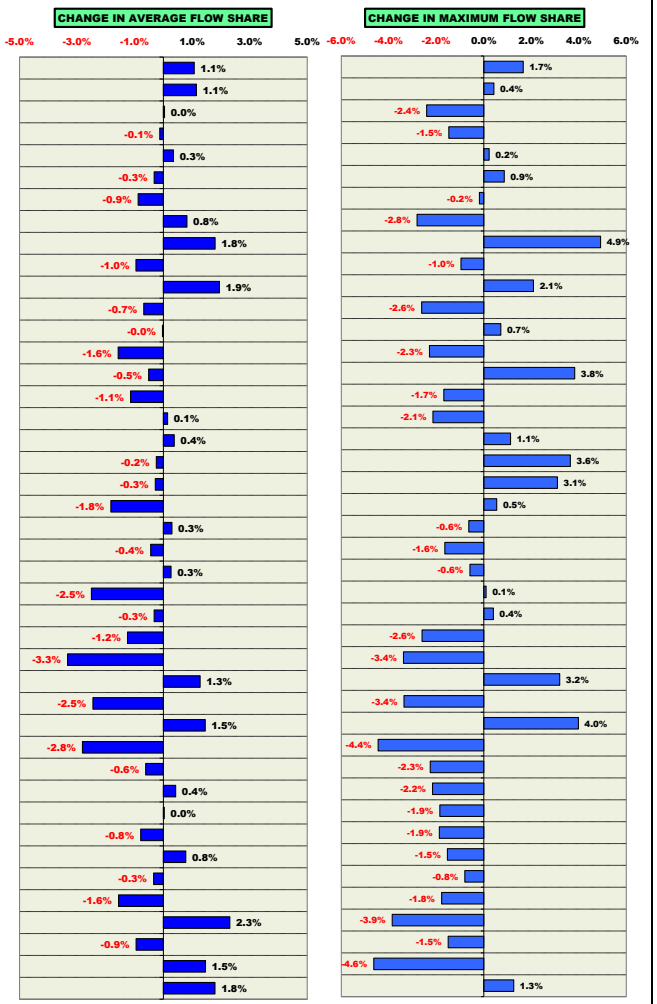
Community Wastewater Flows
4th Quarter - FY21

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

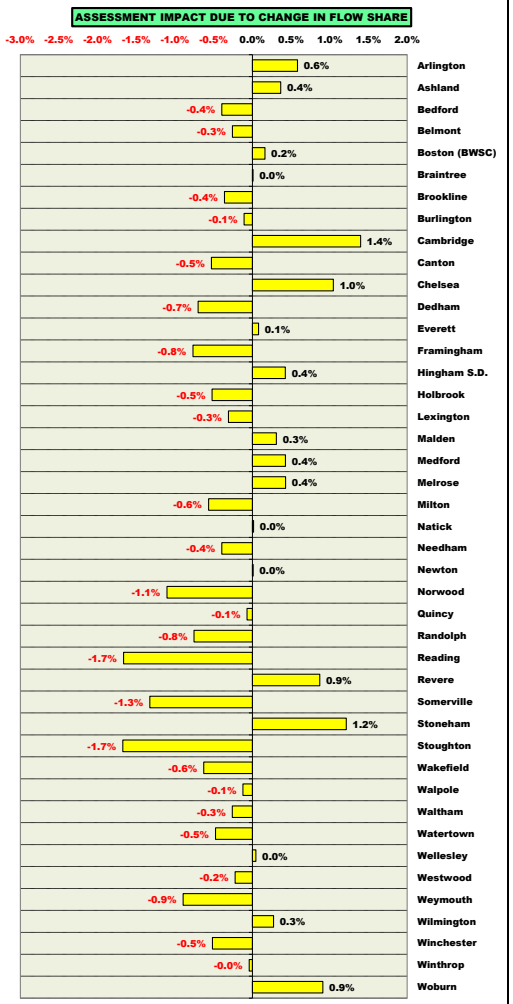
The flow components of FY2023 sewer assessments will be calculated using a 3-year average of CY2019 to CY2021 wastewater flows compared to FY2022 assessments that will use a 3-year average of CY2018 to CY2020 wastewater flows.



But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2019 to CY2021 flow share compared to CY2018 to CY2020 flow share, compared to all other communities in the system.



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



[1] MWRA uses a 3-year flow average to calculate sewer assessments. Three-year averaging 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 2018 and 2019, and January to March, and June to December 2020. April & May 2020 based on the average of three prior years, adjusted for 2020 water use. January to Decmber 2021 estimate based on the average of the three prior years.

[3] Flow data is preliminary and subject to change pending additional MWRA and community review.

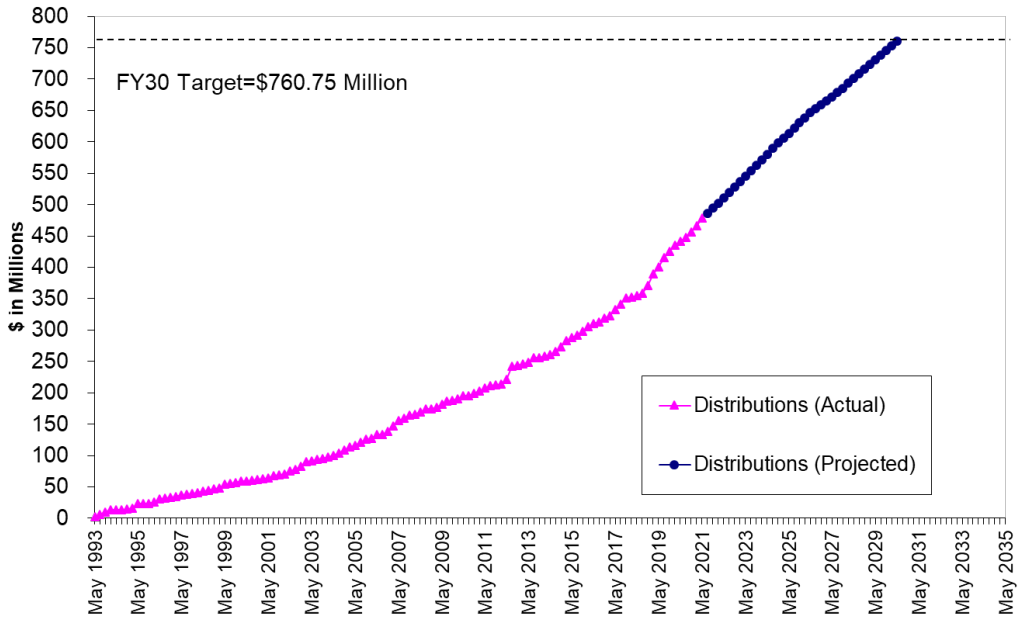
[4] Represents ONLY the impact on the total BASE assessment resulting from the changes in average and maximum wastewater FLOW SHARES.

Community Support Programs
4th Quarter – FY21

Infiltration/Inflow Local Financial Assistance Program

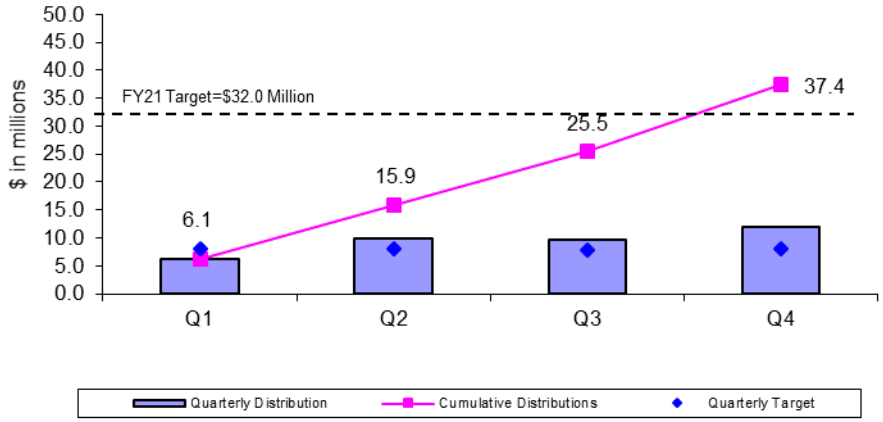
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides $760.75 million in grants and interest-free loans (average of about $20 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Eligible project costs include: sewer rehabilitation construction, pipeline replacement, removal of public and private inflow sources, I/I reduction planning, engineering design, engineering services during construction, etc. I/I Local Financial Assistance Program funds are allocated to member sewer communities based on their percent share of MWRA's wholesale sewer charge. Phase 1-8 funds (total $300.75 million) were distributed as 45% grants and 55% loans with interest-free loans repaid to MWRA over a five-year period. Phase 9 through 12 funds (total $360 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period. Phase 13 provides an additional $100 million in ten-year loan-only funds.

I/I Local Financial Assistance Program Distribution FY93-FY30



During the 4rd Quarter of FY21, $11.9 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Boston, Malden, Quincy and Watertown. Total grant/loan distribution for FY21 is $37.4 million. From FY93 through the 4th Quarter of FY21, all 43 member sewer communities have participated in the program and $478 million has been distributed to fund 629 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.

FY21 Quarterly Distributions of Sewer Grant/Loans

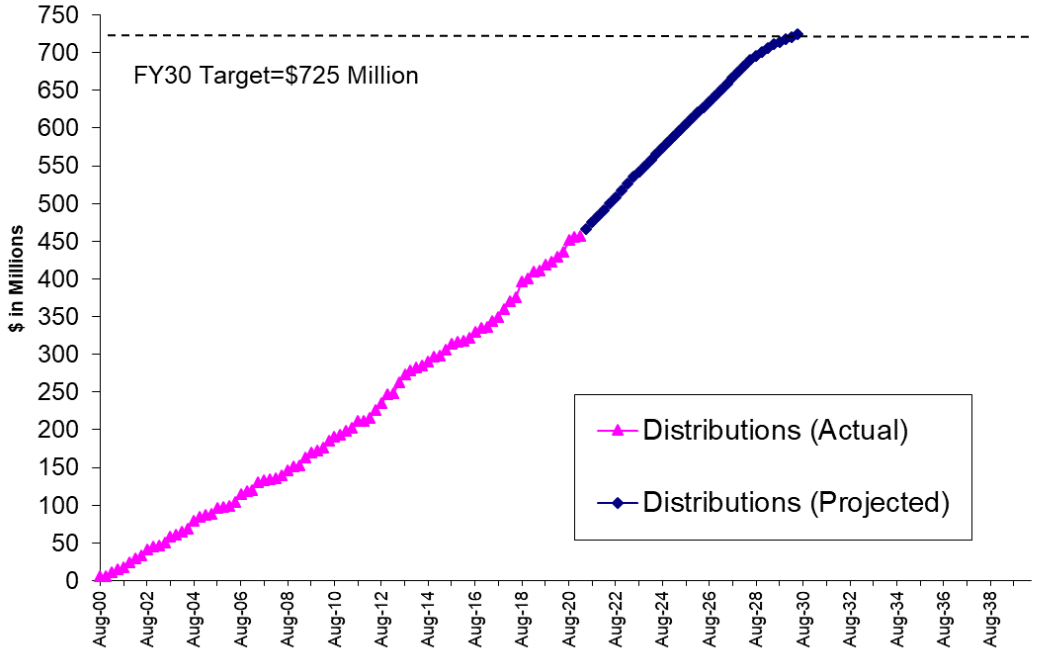


Community Support Programs
4th Quarter – FY21

Local Water System Assistance Program

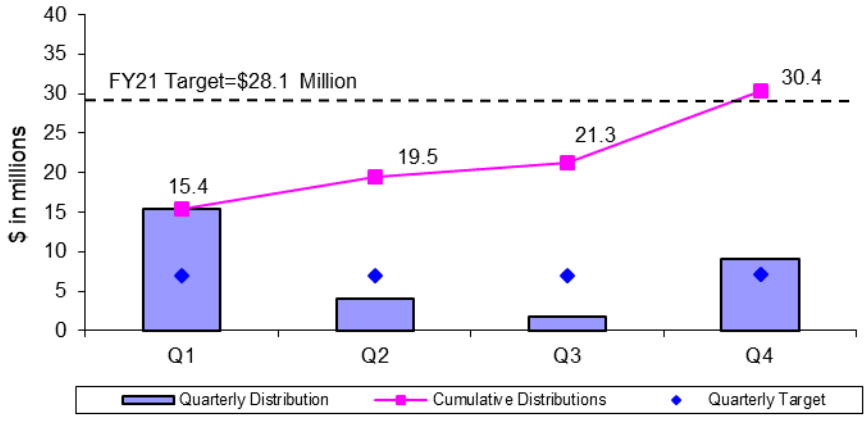
MWRA's Local Water System Assistance Programs (LWSAP) provides $725 million in interest-free loans (an average of about $24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have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

Local Water System Assistance Program Distribution FY01-FY30



During the 4th Quarter of FY21, $9.1 million in interest-free loans was distributed to fund local water projects in Arlington, Boston, Dedham Westwood Water District, Marblehead, Revere, and Watertown. Total loan distribution for FY21 is $30.4 million. From FY01 through the 4th Quarter of FY21, $467 million has been distributed to fund 486 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.

FY21 Quarterly Distributions of Water Loans



Community Support Programs

4th Quarter – FY21

Lead Service Line Replacement Loan Program

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

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

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

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

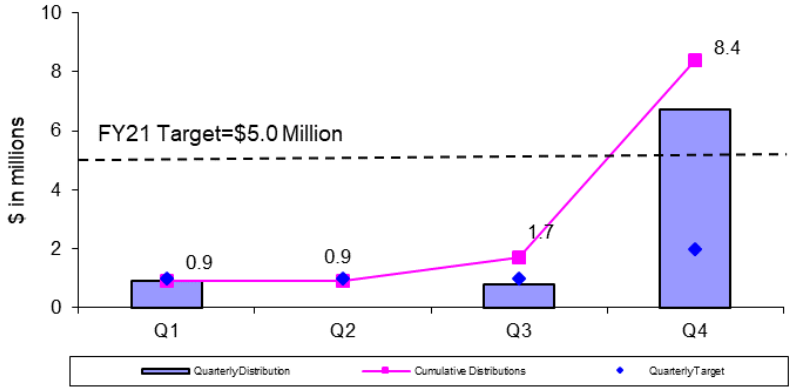
FY20 was the fourth year of the Lead Loan Program - MWRA made eight Lead Loans.

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

Summary of Lead Loans:

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	$25.2 Million

FY21 Quarterly Distributions of Lead Service Line Replacement Loans

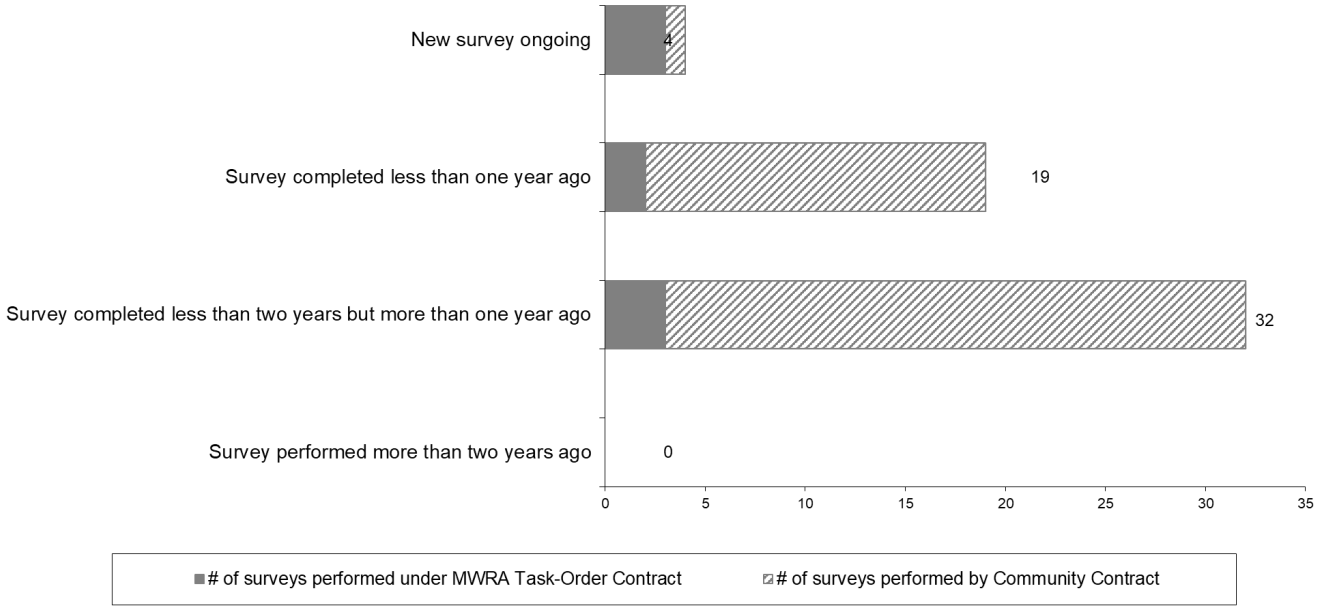


Community Support Programs

4th Quarter – FY21

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 FY21, all member water communities were in compliance with MWRA's Leak Detection Regulation.



Community Water Conservation Outreach

MWRA's Community Water Conservation Program helps to maintain average water demand below the regional water system's safe yield of 300 mgd. Current 5-year average water demand is less than 200 mgd. The local Water Conservation Program includes distribution of water conservation education brochures (indoor - outdoor bill-stuffers) and low-flow water fixtures and related materials (shower heads, faucet aerators, toilet leak detection dye tabs, and instructions), all at no cost to member communities or individual customers. The Program's annual budget is $25,000 for printing and purchase of materials. Annual distribution targets and totals are provided in the table below. Distributions of water conservation materials are made based on requests from member communities and individual customers.

	Annual Target	Q1	Q2	Q3	Q4	Annual Total
Educational Brochures	100,000	360	10,753	61,917	10,204	83,234
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	880	1,635	3,042	1,157	6,714
Toilet Leak Detection Dye Tablets	_____	293	352	5,008	285	5,938

BUSINESS SERVICES

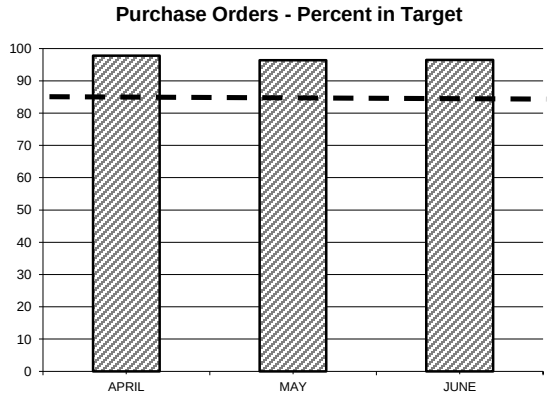
Procurement: Purchasing and Contracts

4th Quarter - FY21

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

Outcome: Processed 95% of purchase orders within target; Average Processing Time was 4.41 days vs. 4.57 days in Qtr 4 of FY20. Processed 76% (13 of 17) of contracts within target timeframes; Average Processing Time was 138 days vs. 193 days in Qtr 4 of FY20.

Purchasing



	No.	TARGET	PERCENT IN TARGET
$0 - $500	573	3 DAYS	92.8%
$500 - $2K	584	7 DAYS	95.1%
$2K - $5K	417	10 DAYS	96.8%
$5K - $10K	37	25 DAYS	91.8%
$10K - $25K	43	30 DAYS	88.3%
$25K - $50K	14	60 DAYS	85.7%
Over $50K	35	90 DAYS	91.4%

The Purchasing Unit processed 1703 purchase orders, 355 more than the 1348 processed in Qtr 4 of FY20 for a total value of $11,880,029 versus a dollar value of $10,674,862 in Qtr 4 of FY20.

Contracts, Change Orders and Amendments

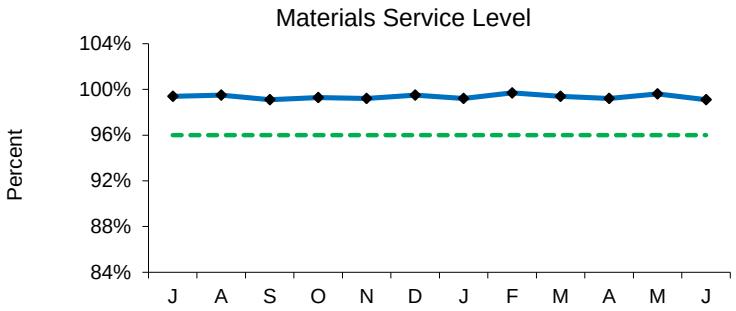
Procurement processed seventeen contracts with a value of $7,712,896 and six amendments with a value of $1,490,534. Eighteen change orders were executed during the period. The dollar value of all non-credit change orders during Q4 FY21 was $883,104 and the value of credit change orders was ($1,286,604).

Four contracts were not processed within the target timeframes. The first contract was delayed due to delays by the contractor obtaining the required signatures to execute the contract based on the signatory's remote work situation and availability. Another contract was delayed due to the extension of the proposal due date to accommodate the bid document release schedule of the associated construction project (7117). A third contract was delayed due to changes to the RFQ/P requirements, timeline and costs in addition to delays in receiving insurance certificates and a MA Foreign Corp Certificate due to COVID-19 circumstances. The final contract was delayed due to administrative delays during the contract execution due to COVID-19 circumstances.

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

Materials Management

4th Quarter - FY21



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,612 (99.3%) of the 7,665 items requested in Q4 from the inventory locations for a total dollar value of $464,652.

Inventory Value - All Sites

Inventory goals focus on:

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

The FY21 goal is to reduce consumable inventory from the July '20 base level ($8.8 million) by 2.0% (approximately $176,369), to $8.6 million by June 30, 2021 (see chart below). This goal has been achieved. Consumable inventory reduction amounted to $230,553, a value of $54,184 over the goal.

Items added to inventory this quarter include:

- Deer Island – gauges, pressure transmitters, controllers, interface communication, actuators, temperature sensor assembly, and temperature metering pump and temperature modules for I&C; level transmitter for Residuals; pump for Power & Pump; safety harnesses, weed killer, eyewash station, lamps, filters and flush valves for entire plant.
- Chelsea – filters, hoses and sample probes for Safety; snow plow modules and harnesses, fuses, filters, fittings, brake pads and rotors and ignition coils for Fleet Service; conveyors, motor controllers and recorders for Work Coordination; bends for Pipeline; frames and covers for Water Operations & Maintenance; syringe filters for TRAC; padlock keys for FOD.
- Southboro – no items were added this quarter for Southboro.

Property Pass Program:

- Eleven audits were conducted during Q4.
- Scrap revenue received for Q4 amounted to $25,476. Year to date revenue received amounted to $64,958.
- Revenue received from online auctions held during Q4 amounted to $42,024. Year to date revenue received amounted to $284,470.

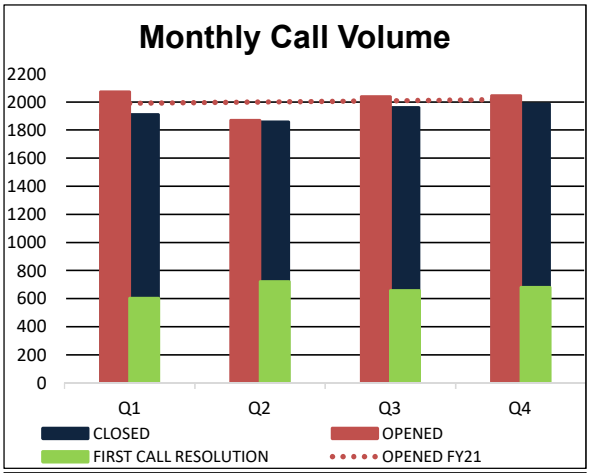
Items	Base Value July-20	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,818,459	8,587,906	-230,553
Spare Parts	8,797,946	9,160,439	362,493
Total	17,616,405	17,748,345	131,940

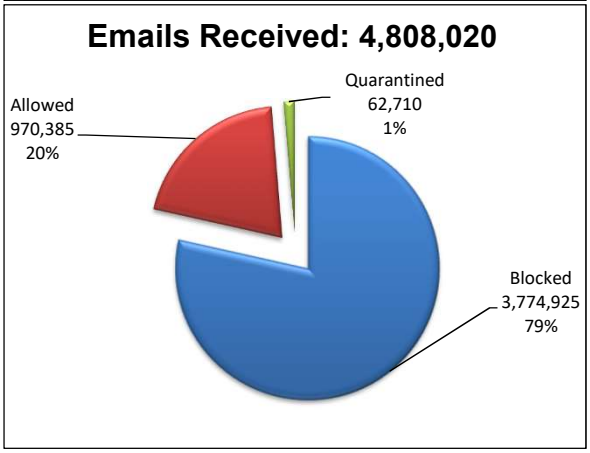
Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

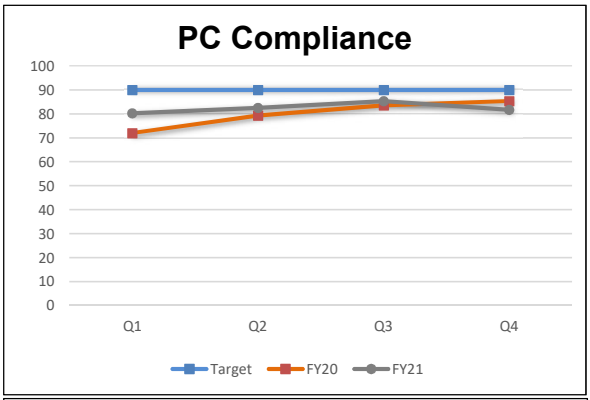
MIS Program

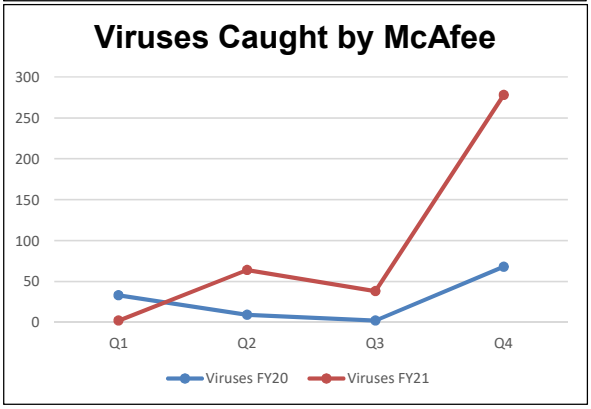
Fourth Quarter – FY21

Numbers & Statistics









Project Updates

Infrastructure & Security

AWIA Risk and Resiliency Assessment: Remediation work to resolve vulnerabilities continued. At the end of the quarter, 64% of the identified tasks were "Completed"; 3% were "In Progress"; and 33% were identified as longer term projects.

Cyber Security Awareness Training: 99% of the assigned 889 employees have completed their assignments. 46% of the additional 270 Water and Wastewater staff that do not use computers regularly have completed their training.

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

Aquarius: Application has been upgraded to NG (newest version) on a new SQL Server.

New SQL Server: Multiple new 2019 servers that support Tiscor, Lobby TRAC, Telog, and PI installed this quarter.

Deer Island: Upgraded internet circuit from an outdated T1 to a 50 MB.

Digital Signage: Pilot in Chelsea Maintenance building completed successfully. Staff scoping requirements for 7 new locations

Other Software & Custom Applications

COVID Self-Certification: Went live with web app and phone app that allows employees to self-certify they are COVID symptom-free prior to entering the workplace.

ECM/Electronic Document Management: Internal and vendor team kick off meetings held. Started looking at data migration requirements, finalized controlled vocabulary, and had multiple meetings with vendor on infrastructure, records management, and departmental files structures. Exploring standardization of documentation processes and folder hierarchies across Engineering, Construction, DI-TIC and DISC.

MWRA Website Replacement: Preliminary meetings with Procurement for project to upgrade the platform and modernize both the external website and Pipeline.

Learning Management System: Internal staff training complete. Began migration of existing course content into the LMS. Several course catalogs/learning paths (grouping of courses) along with outside license records have been added. Integration with LinkedIn established. Employee and historical data migration continues to be explored.

Visitor Management: Added an additional visitor group to account for unannounced visitors / deliveries. Received go-ahead from business sponsor to begin User Acceptance Testing after successful demo completed. UAT scripts and Job Aids completed.

PIMS Appeon PowerBuilder Upgrade: Installed new PIMS client on updated servers. User Acceptance Testing completed.

Library, Record Center, & Training

Library: Undertook 23 research requests (69 YTD), supplied 21 books for circulation (83 YTD), provided 19 articles (62 YTD), and 12 (145 YTD) standards. The MWRA Library Portal supported 704 end-user searches (2,686 YTD). Research topics include historic drawings of Marlborough, historic drawings of Farm Pond Gatehouse, Schenk's Dam Toe, EPA-Sen. Grassley letters.

Record Center (RC): The Record Center added 288 (745 YTD) new boxes, handled 584 (1,185 YTD) total boxes, and shredded 10 (42 YTD) 65 gallon bins of confidential documentation on-site. Analysis of scope for document scanning due to building consolidation underway. The RC manager attended 3 (9 YTD) RCB virtual meetings. The RC did 57 (72 YTD) physical box searches for requested information. Requested searches included Tunnel Redundancy information, Litigation, construction projects, HR related items, Walnut Hill and Metro West information.

Training: In Q4, 73 online IT lessons were taken (139 YTD), by 11 employees (33 YTD), spanning 152 hours (244 YTD).

Legal Matters

4th Quarter - FY21

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits:** Reviewed seventy-eight (78) 8(m) permits. Finalized Fens Gatehouse Direct Connect Permit 20 09 186DC – MWRA's Boston Marginal Conduit.

- **Real Property:** Reviewed property rights, title documents and outlined processes for acquisition of property interests to support MWRA's Tunnel Redundancy Department with the Metropolitan Water Tunnel Program. Reviewed CNY lease with respect to responsibility for damage related to water damage that occurred in Building 39 as a result a failed water tank on January 4, 2021 and drafted response to landlord. Drafted license related to Dorchester Interceptor Rehabilitation Contract 7279. Reviewed Chelsea Lease relative to option to purchase 2 Griffin Way property in Chelsea and reviewed property rights through chain of title documents and title certification for the 2 Griffin Way property. Reviewed requirements for deed restriction at MWRA's Chelsea Headworks. Reviewed MWRA's property rights in the area of 69 Clinton Road in Brookline and in the area of the former Green property, which is adjacent to DITP. Researched Payment in Lieu of Taxes and Applicability to Non-Watershed Property for MWRA. Researched eminent domain taking powers for MWRA and MBTA. Reviewed Wachusett Watershed Fee Acquisition, W-001229 for approximately 36.08 acres in Leominster and Sterling. Reviewed proposed realignment of water easement for MWRA's Northern Intermediate High Section 89 water main located in the area of 2 Hill Street, Woburn as it relates to housing development and MWRA Contract 7117 - Northern Intermediate High Section 89 Replacement Pipeline. Reviewed Sudbury Aqueduct property rights in area of 1058 and 1062 Beacon Street in Newton, MWRA's property rights in area of Norumbega covered storage property, MWRA's property rights in area of Cosgrove intake in Clinton, and easement rights related to proposed traffic lights near Griffin Way in Chelsea. Finalized license related to Dorchester Interceptor Rehabilitation Contract 7279. Reviewed property rights in area of 16 Courtney Road in West Roxbury related to complaint to quiet title, where MWRA is a named party, to determine the origin of a drainage easement. Researched MWRA's property rights in the areas of I90/I95; and reviewed title documents in Waltham, outlined acquisition process for property interest to support MWRA's Metropolitan Water Tunnel Program. Reviewed Chelsea lease and amendments; edited and finalized estoppel certificate. Drafted memorandum of understanding for Section 89 Waterline Replacement Project for MWRA Contract 7117. Reviewed property rights for 2 Hill Street, Woburn and MWRA's easement. Reviewed property rights along Eastern Avenue and Griffin Way, Chelsea for anticipated traffic light signal project. Researched and advised on eminent domain taking powers for MWRA. Drafted conveyance agreement for property disposition to City of Quincy for 2 Cleverly Court. Reviewed property rights for Nash Hill Telecommunication Tower. Reviewed House Bill 3770 and case law on project labor agreements.

- **Public Records Requests:** During the months of April, May and June, MWRA received and responded to one hundred eighty three (183) public records requests.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

Four demands for arbitration were filed.

A charge was filed at the Massachusetts Commission Against Discrimination alleging that the MWRA discriminated against an employee on the basis of national origin, race, and color, following his non-selection for a promotion.

Matters Concluded

Received an arbitrator's decision in favor of the MWRA following a hearing on a grievance alleging that it violated a collective bargaining agreement when grievant was suspended and demoted for safety violations and making misleading statements.

LITIGATION/CLAIMS

New lawsuits/claims: In re Mercedes-Benz Emissions Litigation,
United States District Court for the District of New Jersey;
16-cv-881 (KM) (ESK)
Law Division has been notified of a class action lawsuit that relates to "Bought or Leased Mercedes-Benz or Sprinter Blue TEC II Diesel Vehicles" that may be eligible for certain cash payments and/or an extended warranty. Six MWRA fleet vehicles qualify for inclusion in the settlement.

DiGregorio, et al. v. Griffin Way, LLC v. MWRA,
C.A. No. 2084-CV-02429-K
On May 18, 2021, MWRA was served with a Third Party Complaint in a personal injury action against Griffin Way, LLC, by a former employee of the MWRA Retirement Board arising out of a slip and fall in the lobby of MWRA's Chelsea facility in September 2019. Plaintiff alleges Griffin Way, as owner of the property, was negligent in failing to keep the property in a safe condition. The Third Party Complaint, in turn, seeks indemnity from MWRA as the tenant of the building. Plaintiff seeks medical and other expenses, as well as a loss of consortium claim by her husband.

Kilgannon v. Boston Water Sewer Commission, et als.,
21 MISC 000240 (MDV)
Plaintiff filed a Quiet Title Action in the Land Court against various parties seeking a declaration that a drainage easement referenced on a 1924 plan of real property owned by him at 16 Courtney Road in West Roxbury has been abandoned and, therefore, extinguished. Staff confirmed that MWRA maintains no assets or infrastructure in or around the location of the property. A Case Management Conference was held on June 4, 2021. All defendants, including MWRA, BWSC and DCR, either assented or did not object to judgment in Plaintiff's favor. The court ordered Plaintiff to file certain motions for appropriate disposition of the case by July 2, 2021.

Closed Cases: (Former employee) v. MWRA, C.A. No.19-CV-01847
A Stipulation of Dismissal was filed with the court on May 28, 2021. The matter is now closed.

MWRA v. NEL Corp., Dewberry, et al., Suffolk Superior Court C.A. No. 18-CV 01156-BLS1
A Stipulation of Dismissal was filed with the court on June 16, 2021. The matter is now closed.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of June 2021	As of Mar 2021	As of Dec 2021
Construction/Contract/Bid Protest (other than BHP)	0	1	1
Tort/Labor/Employment	3	4	3
Environmental/Regulatory/Other	3	2	2
Eminent Domain/Real Estate	1	0	0
Total	**7**	**7**	**6**
Other Litigation matters (restraining orders, etc.)	2	2	2
TOTAL – all pending lawsuits	**9**	**9**	**8**
Claims not in suit: 1. Granados MVA Claim	1	1	0
Bankruptcy	1	1	1
Wage Garnishment	2	2	2
TRAC/Adjudicatory Appeals	0	0	0
Subpoenas	0	0	0
TOTAL – ALL LITIGATION MATTERS	**13**	**13**	**11**

Significant Developments There are no new Significant Developments to report.
Closed Claims: There are no closed claims to report.

Subpoenas Wage During the Fourth Quarter of FY 2021, no subpoenas were received and no subpoenas were pending at the end of the Fourth Quarter FY 2021.

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

TRAC/MISC.

New Appeals: There are no new appeals in the 4th Quarter FY 2021.

Settlement by Agreement of Parties There are no Settlements by Agreement of Parties in the 4th Quarter FY 2021.

Stipulation of Dismissal No Joint Stipulation of Dismissals filed.

Notice of Dismissal Fine paid in full No Notices of Dismissal, Fine Paid in Full.

Tentative Decision There are no Tentative Decisions issued in the 4th Quarter FY 2021.
Final Decisions There are no Final Decisions issued in the 4th Quarter FY 2021.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
4th Quarter FY21

Highlights

During the 4th quarter FY21, Internal Audit (IA) completed a review of Compliance Status of Employees' Mandatory Confined Space Entry Training. IA noted several employees who require confined space entry training are overdue. IA provided several recommendations relating to identifying, tracking and reporting those employees who need required training. Support to staff on Return to Work Guidance continued through May as the Authority prepared for a hybrid work in office/work from home model. An internal review of water and wastewater licenses and certifications is progressing.

In addition, IA completed a true-up of 2020 operating expenses for the HEEC cable, reviewed the Fore River Railroad 2020 tax return, and completed preliminary reviews of 3 professional service contracts while 3 others are in process. IA issued 51 indirect cost rate letters to professional service consultants. Management advisory services included support on the MWRA's leases and recovery of overcharged office supplies is progressing.

Status of Recommendations

During FY21, 10 recommendations were closed.

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

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

Report Title (issue date)	Audit Recommendations		
	Open	Closed	Total
Fuel Use & Mileage Tracking (12/31/18)	3	5	8
Asset Tracking – Fleet Data Verification (8/21/19)	1	15	16
Fleet Services Non-Plated Equipment Inspections (3/30/20)	9	6	15
Overhead Crane Inspections (4/28/21)	11	0	11
Compliance Status of Employees' Mandatory Confined Space Entry Training (6/30/21)	8	0	8
Total Recommendations	*32*	*26*	*58*

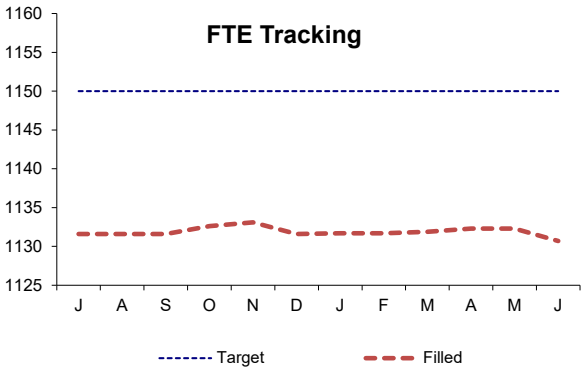
Cost Savings

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

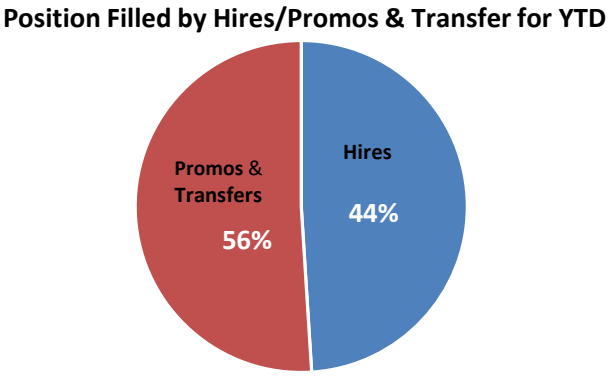
Cost Savings	FY17	FY18	FY19	FY20	FY21 Q4	TOTALS
Consultants	$272,431	$118,782	$262,384	$643,845	$563,525	$1,860,967
Contractors & Vendors	$3,037,712	$1,323,156	$3,152,884	$2,097,729	$1,547,223	$11,158,704
Internal Audits	$224,178	$204,202	$210,063	$212,517	$214,458	$1,065,418
Total	**$3,534,321**	**$1,646,140**	**$3,625,331**	**$2,954,091**	**$2,325,206**	**$14,085,089**

OTHER MANAGEMENT

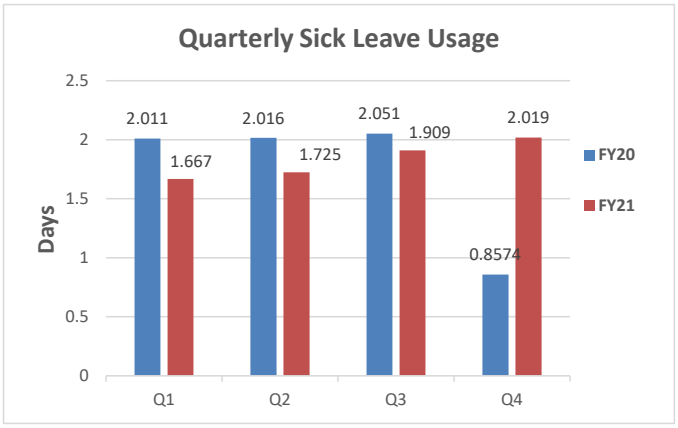
Workforce Management
4th Quarter - FY21



FY21 Target for FTE's = 1150
FTE's as of June 2021 = 1130.7
Tunnel Redundancy as of June 2021 = 10.0



	Pr/Trns	Hires	Total
FY19	112 (60%)	76 (40%)	188
FY20	84 (59%)	58 (41%)	142
FY21	81 (56%)	64(44%)	145

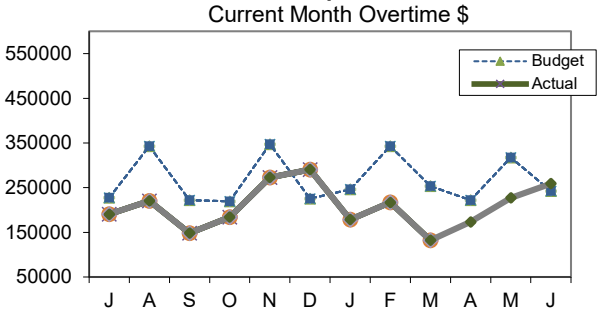


	Number of Employees	YTD (usage to date)	Annualized Total	Annual FMLA %	FY20
Admin	141	5.87	5.87	15.6%	6.48
Aff. Action	7	3.60	3.60	0.0%	6.42
Executive	4	4.17	4.17	0.0%	1.81
Finance	35	3.14	3.14	0.0%	4.09
Internal Audit	6	0.90	0.90	0.0%	5.08
Law	12	5.83	5.83	8.9%	6.71
OEP	5	1.33	1.33	0.0%	1.00
Operations	920	7.95	7.95	19.5%	7.27
Tunnel Redundancy	10	1.63	1.63	17.8%	4.93
Public Affairs	11	1.13	1.13	0.0%	7.96
MWRA Avg	**1151**	**7.32**	**7.32**	**18.6%**	**6.94**

Sick leave usage in 4th Quarter of FY21 is higher than usage in the 4th Quarter of FY20.

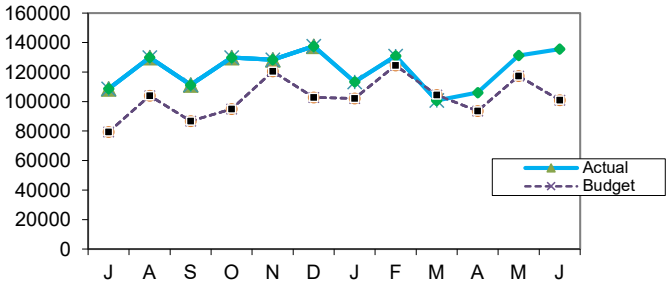
Percent of sick leave usage for FY21 attributable to Family and Medical Leave Act (FMLA) is 18.6%

Field Operations
Current Month Overtime $



Total Overtime for Field Operations for the fourth quarter of FY21 was $660k which is ($123k) under budget. Emergency overtime was $328k, which is ($77k) under budget. Rain Events totaled $232k and Emergency Maintenance was $46k and Emergency Operations was $2k. Coverage overtime was $214k which is $43k over budget, reflecting the quarter's shift coverage requirements. Planned overtime was $118k, which is ($86k) under budget with combined spending of $61k for all Maintenance, $26k for Planned Operations and $11k for Training.

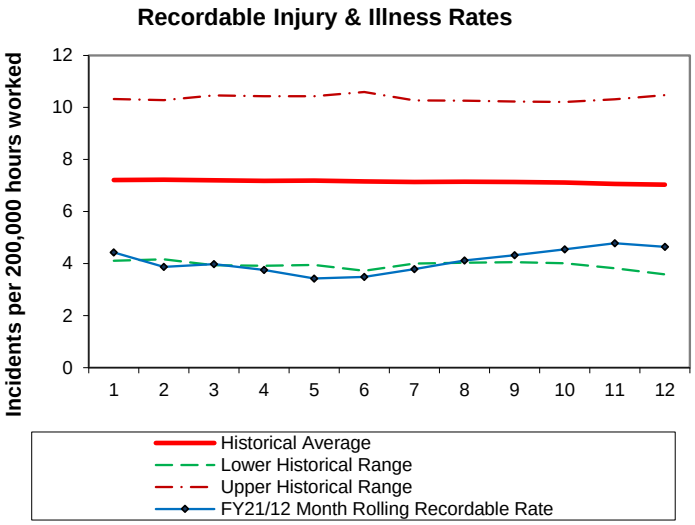
Deer Island Treatment Plant
Current Month Overtime $

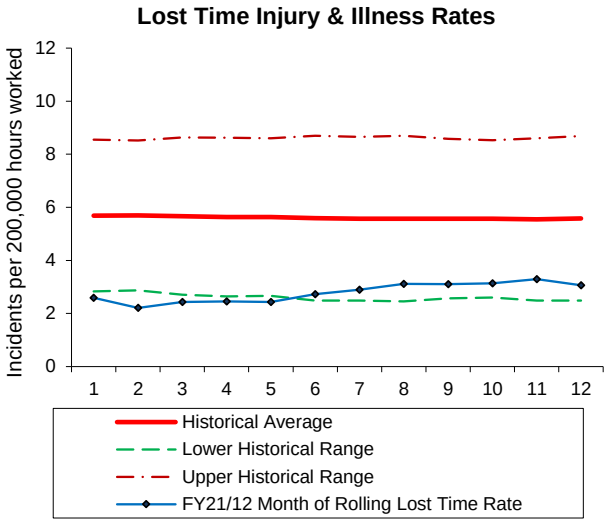


Deer Island's total overtime expenditure for the fourth quarter was $373K, which was $61K or 19.6% over budget. In the fourth quarter, Deer Island experienced higher than anticipated shift coverage of $60K and planned/unplanned of $24K. This was offset by lower than anticipated storm coverage of ($23K). YTD Deer Island's overtime spending is $1.3M, which is $198K or 17.5% over budget due to higher than anticipated shift coverage of $195K; and planned/unplanned overtime of $12K. This is offset by lower storm coverage of $9K. During October, Eversource conducted 4 days of annual maintenance on the HEEC cable which accounted for $27K of the overspending for the year. COVID-19 related OT has accounted for $74K of the overspending for the fiscal year.

Workplace Safety

4th Quarter - FY21





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 FY21. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively.

4 With Changes in state law, in February 1, 2019, MWRA began record keeping and reporting according to Federal OSHA standards for injury and illness record keeping. Strictly adhering to the federal OSHA reporting regulation has caused an increase in recorded injuries and illnesses. This increase is causing both the Recordable injury and illness Rate and the Lost TIme Injury and Illness rate to trend higher than in past years but does not necessarily mean there is an increase in injuries or illnesses. OSHA injuries and illnesses, and lost time are recorded differently than the Massachusetts Workers' Compensation standards and could result in an increase in the OSHA rate while the Workers' Compensation claims are decreasing. Over time, the rise on the charts should stabilize as new data replaces the older data..

WORKERS COMPENSATION HIGHLIGHTS

	4th Quarter Information		
	New	Closed	Open Claims
Lost Time	7	12	59
Medical Only	12	16	19
Report Only	3	3	
	QYTD		FYTD
Regular Duty Returns	7		17
Light Duty Returns	0		0
Indemnity payments as of June 30 2021 included in open claims listed			19

COMMENTS:

Regular Duty Returns

Apr	0	Employees returned to full duty/no restrictions
May	3	Employees returned to full duty/no restrictions
June	4	Employees returned to full duty/no restrictions

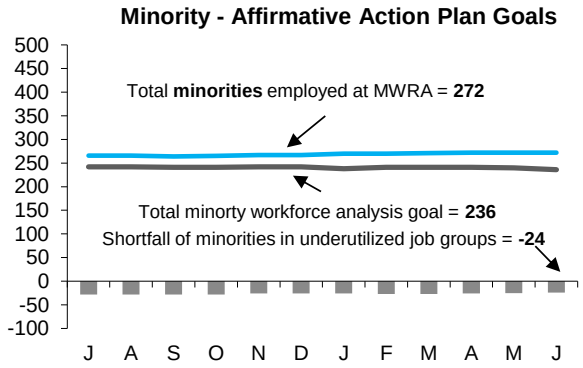
Light Duty Returns

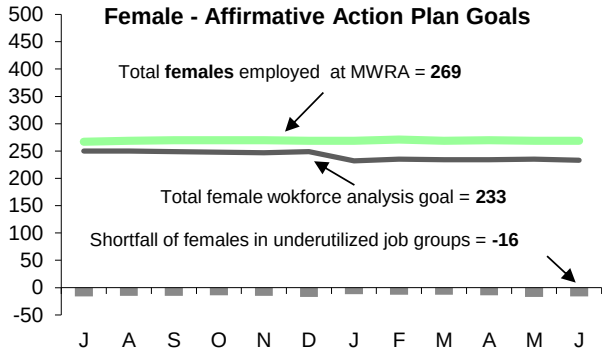
Apr N/A
May N/A
June N/A

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

MWRA Job Group Representation

4th Quarter - FY21





Highlights:

At the end of Q4 FY21, 5 job groups or a total of 24 positions are underutilized by minorities as compared to 5 job groups for a total of 29 positions at the end of Q4 FY20; for females 5 job groups or a total of 16 positions are underutilized by females as compared to 8 job groups or a total of 17 positions at the end of Q4 FY21. During Q4, 4 minorities and 4 females were hired. During this same period 1 minority and 2 females were terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 6/30/2021	Minorities as of 6/30/2021	Achievement Level	Minority Over or Under Underutilized	Females As of 6/30/2021	Achievement Level	Female Over or Under Underutilized
Administrator A	24	3	1	2	12	6	6
Administrator B	24	1	7	-6	7	5	2
Clerical A	30	10	6	4	27	23	4
Clerical B	23	8	6	2	3	7	-4
Engineer A	82	25	18	7	18	20	-2
Engineer B	60	20	16	4	13	9	4
Craft A	115	15	21	-6	0	4	-4
Craft B	139	21	19	2	3	3	0
Laborer	71	22	16	6	5	3	2
Management A	92	22	28	-6	34	19	15
Management B	43	11	9	2	9	10	-1
Operator A	67	5	9	-4	3	2	1
Operator B	68	21	9	12	3	1	2
Professional A	27	4	6	-2	17	12	5
Professional B	174	51	41	10	85	74	11
Para Professional	49	15	10	5	22	22	0
Technical A	57	16	13	3	7	12	-5
Technical B	6	2	1	1	1	1	0
Total	**1151**	**272**	**236**	**60/-24**	**269**	**233**	**52/-16**

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/ Transfers	AACU Ref. External	Position Status
Administrative B	Director, SCADA, Metering &Monitoring	1	Int./Ext.	1	0	Promo = WM
Administrative B	Director, Western Operations & Maint.	1	Int.	1	0	Promo = WM
Craft A	Sewer Maintenance Supervisor	1	Int.	1	0	Promo = WM
Craft A	M&O Specialist	1	Int./Ext.	1	0	Transfer = WM
Craft A	Specialty Valve Foreman	1	Int.	1	0	Promo = WM
Craft A	Unit Supervisor	1	Int.	1	0	Promo = WM
Craft A	WSS Foreman	1	Int.	1	0	Transfer = WM
Engineer A	Program Manager	1	Int./Ext.	1	0	Promo = WF
Engineer A	Program Manager, Electrical (Chelsea)	1	Int.	1	0	Promo = M
Engineer A	Program Manager, SCADA (Tech)	1	Int./Ext.	1	0	Promo = AM
Engineer A	Senior Engineer	1	Int./Ext.	0	0	NH = WM
Engineer A	Senior Engineer	1	Int./Ext.	1	0	Promo = WF
Management A	Manager, Operations (Wastewater)	1	Int./Ext.	0	0	NH = WM
Operators A	Director, Environmental & Reg Affairs	1	Int.	1	0	Promo = WF

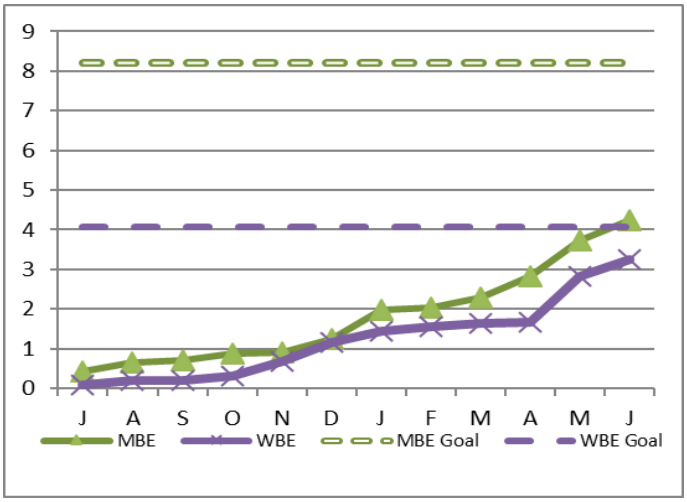
MBE/WBE Expenditures

4th Quarter - FY21

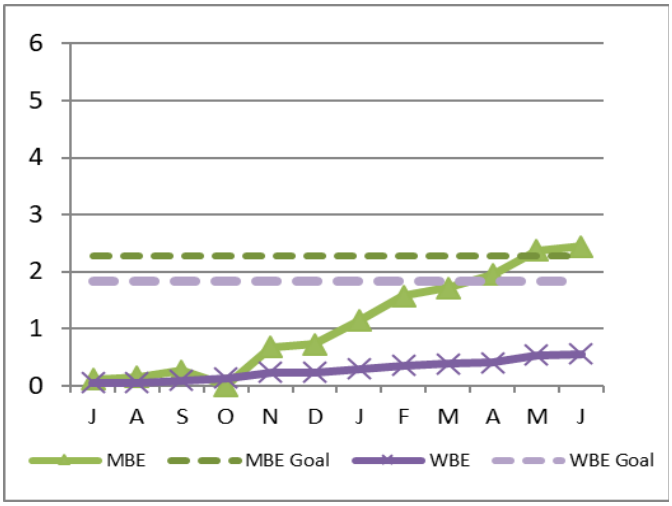
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY21 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they have no MBE/WBE spending goals.

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

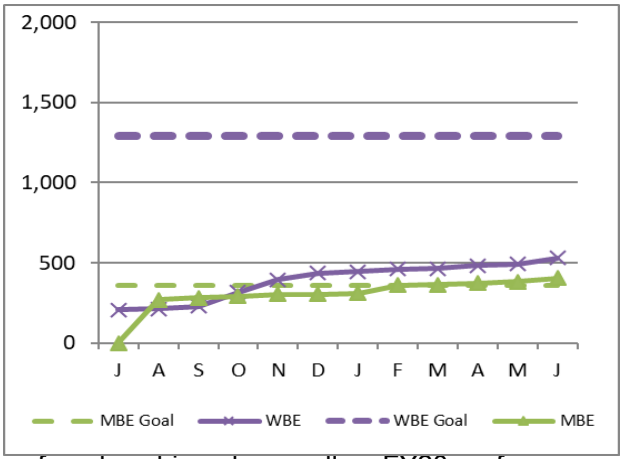
Construction



Professional Services



Goods/Services



FY21 spending and percentage of goals achieved, as well as FY20 performance are as follows:

MBE					WBE			
FY21 YTD		**FY20**			**FY21 YTD**		**FY20**	
Amount	**Percent**	**Amount**	**Percent**		**Amount**	**Percent**	**Amount**	**Percent**
4,234,355	51.6%	3,641,145	45.6%	Construction	3,238,772	79.3%	2,446,388	61.7%
2,439,855	107.0%	2,322,007	111.9%	Prof Svcs	554,298	30.3%	942,850	56.6%
403,728	113.2%	340,656	94.1%	Goods/Svcs	528,645	40.9%	993,375	81.3%
7,077,938	65.3%	6,303,808	60.5%	**Totals**	4,321,715	60.0%	4,382,613	63.9%

FY21 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

MWRA FY21 CEB Expenses

4th Quarter – FY21

As of June 2021, total expenses are $778.4 million, $13.0 million or 1.6% lower than budget, and total revenue is $793.1 million, $1.8 million or 0.1% over budget, for a net variance of $14.7 million.

Direct Expenses are $239.5 million, $12.7 million or 5.0% under budget.

1

- **Wages & Salaries** are under budget by $3.1 million or 2.7%. Regular pay is $3.0 million under budget, due to lower head count, and timing of backfilling positions. YTD through June, the average Full Time Equivalent (FTE) positions was 1,140, twenty-three fewer than the 1,163 FTE's budgeted.
- **Utilities** are $2.3 million under budget or 9.6%, driven by Diesel Fuel, which is $1.3 million under budget, as Deer Island has not yet topped off its tanks. In addition, under spending for Electricity of $987k of which $664k is from Deer Island and $105k is from Water Operations, both due to favorable pricing and lower demand. Lower flows at Deer Island (7.2% under budget) contributed to lower electricity demand. Water Operations is under budget primarily due to lower rates and quantity.
- **Maintenance** expenses are $2.0 million under budget or 6.0%, primarily due to the timing of projects.
- **Other Services** are $1.3 million under budget or 5.3%, primarily due to under spending for Sludge Pelletization of $1.1 million due to lower YTD quantities, Grit Screen Removal of $149k also due to lower YTD quantities, partially offset by higher spending of $175k for Other Services.
- **Professional Services** are $1.0 million under budget or 11.9%, primarily due to under spending for Computer Systems Consultants of $1.0 million due to timing of several MIS projects and Engineering Services of $453k, partially offset by overspending on Lab Testing and Analysis of $439k, which is driven by the Biobot engagement.
- **Fringe Benefits** are $708k under budget or 3.2%, primarily due to Health Insurance of $589k due to lower headcount.
- **Worker's Compensation** expenses are $634k under budget or 25.6%, primarily due to Compensation payments reflecting fewer accidents and reduced severity of those accidents.
- **Overtime** expenses are $604k under budget or 12.0%, primarily due to reduced need for emergency and planned overtime for maintenance in Field Operations, partially offset by higher spending on DI for shift coverage including Covid-19 coverage and unplanned maintenance including HEEC maintenance.
- **Indirect Expenses** are $58.9 million, $1.7 million over budget or 2.9%. The HEEC cable costs totaled $10.2 million through June, $3.0 million above budget as revised costs for the new HEEC Cable. Watershed Reimbursements were $577k under budget reflecting lower operating costs and combined with Pension Expense which was $1.0 million below budget combined to partially offset HEEC overspending. The pension contribution requirement was revised in response to the most recent actuarial valuation report's funding schedule which reduced pension expense by $1.0 million for FY21.

Capital Finance Expenses totaled $480.0 million and was $1.9 million or 0.4% below budget after the impact of the spring defeasance. Surplus was a result of lower than budget variable interest expense of $9.9 million due to lower interest rates combined with lower SRF spending of $9.2 million due to bond issue timing, lower Water Pipeline CP of $5.1 million due to lower than budgeted interest rates, offset by higher Senior Debt of $22.3 million, as a result of defeasance expenditures of $25.6 million.

Revenue and Income –

Total Revenue and Income is $793.1 million, $1.8 million over budget. Other Revenue of $8.6 million was over budget by $2.5 million, reflecting receipt of $1.3 million from the Commonwealth for Debt Service Assistance. Also, higher energy revenue of $505k, income from the disposal of equipment of $317k, and miscellaneous revenue of $231k. This revenue gain was reduced by lower investment income. Investment income totaled $4.2 million, $926k million under budget due to lower than budgeted interest rates (0.47% vs 0.68%) slightly offset by higher than budgeted average balances.

	Jun 2021 Year-to-Date			
	Period 12 YTD Budget	Period 12 YTD Actual	Period 12 YTD Variance	%
EXPENSES				
WAGES AND SALARIES	$ 112,919,298	$ 109,857,067	$ (3,062,231)	-2.7%
OVERTIME	5,019,295	4,415,142	(604,153)	-12.0%
FRINGE BENEFITS	22,402,224	21,694,636	(707,588)	-3.2%
WORKERS' COMPENSATION	2,476,655	1,842,853	(633,802)	-25.6%
CHEMICALS	12,091,255	11,652,051	(439,204)	-3.6%
ENERGY AND UTILITIES	24,200,847	21,887,023	(2,313,824)	-9.6%
MAINTENANCE	32,618,569	30,660,795	(1,957,774)	-6.0%
TRAINING AND MEETINGS	405,264	150,787	(254,477)	-62.8%
PROFESSIONAL SERVICES	8,377,283	7,377,648	(999,635)	-11.9%
OTHER MATERIALS	6,706,916	6,272,620	(434,296)	-6.5%
OTHER SERVICES	24,983,777	23,656,946	(1,326,831)	-5.3%
TOTAL DIRECT EXPENSES	**$ 252,201,383**	**$ 239,467,568**	**$ (12,733,817)**	**-5.0%**
INSURANCE	$ 3,059,218	$ 3,361,487	$ 302,269	9.9%
WATERSHED/PILOT	26,422,138	25,844,695	(577,443)	-2.2%
HEEC PAYMENT	7,215,200	10,189,727	2,974,527	41.2%
MITIGATION	1,692,344	1,652,058	(40,286)	-2.4%
ADDITIONS TO RESERVES	1,815,077	1,815,077	-	0.0%
RETIREMENT FUND	11,000,000	10,000,000	(1,000,000)	-9.1%
POST EMPLOYEE BENEFITS	6,065,490	6,065,490	-	0.0%
TOTAL INDIRECT EXPENSES	**$ 57,269,467**	**$ 58,928,534**	**$ 1,659,067**	**2.9%**
STATE REVOLVING FUND	$ 97,811,162	$ 88,657,488	$ (9,153,674)	-9.4%
SENIOR DEBT	258,730,904	281,064,031	22,333,127	8.6%
DEBT SERVICE ASSISTANCE	-	-	-	---
CURRENT REVENUE/CAPITAL	16,200,000	16,200,000	-	0.0%
SUBORDINATE MWRA DEBT	96,339,598	96,339,598	-	0.0%
LOCAL WATER PIPELINE CP	5,686,864	545,023	(5,141,841)	-90.4%
CAPITAL LEASE	3,217,060	3,217,060	-	0.0%
VARIABLE DEBT	-	(9,915,154)	(9,915,154)	---
DEFEASANCE ACCOUNT	-	-	-	---
DEBT PREPAYMENT	3,900,000	3,900,000	-	0.0%
TOTAL CAPITAL FINANCE EXPENSE	**$ 481,885,588**	**$ 480,008,046**	**$ (1,877,542)**	**-0.4%**
TOTAL EXPENSES	**$ 791,356,438**	**$ 778,404,148**	**$ (12,952,292)**	**-1.6%**
REVENUE & INCOME				
RATE REVENUE	$ 769,385,000	$ 769,385,000	$ -	0.0%
OTHER USER CHARGES	9,208,367	9,443,294	234,927	2.6%
OTHER REVENUE	6,095,403	8,578,511	2,483,108	40.7%
RATE STABILIZATION	1,500,000	1,500,000	-	0.0%
INVESTMENT INCOME	5,167,668	4,242,037	(925,631)	-17.9%
TOTAL REVENUE & INCOME	**$ 791,356,438**	**$ 793,148,842**	**$ 1,792,404**	**0.1%**

Cost of Debt
4th Quarter – FY21

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 ($3.40 billion)	3.39%
Variable Debt ($330.7million)	0.49%
SRF Debt ($894.1 million)	1.60%
Weighted Average Debt Cost ($4.63 billion)	2.84%

Most Recent Senior Fixed Debt Issue
August 2020

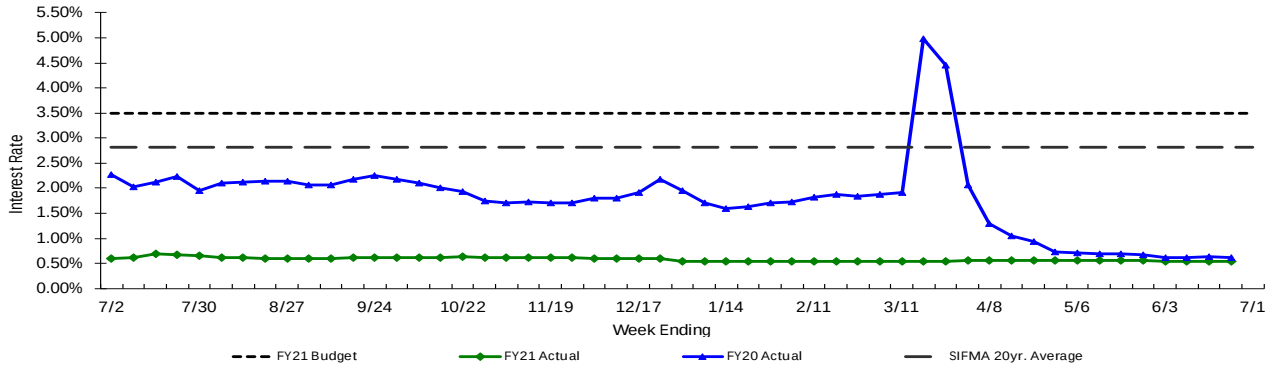
2020 Series B ($160.0 million)	2.33 %

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

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

Weekly Average Variable Interest Rates vs. Budget

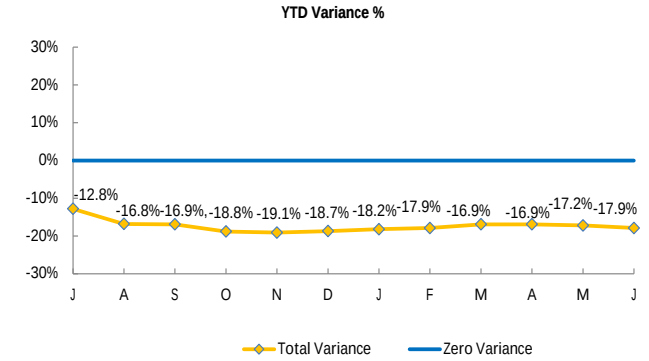
MWRA currently has ten variable rate debt issues with $596.6 million outstanding, excluding commercial paper. Of the ten outstanding series, four have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In June, the SIFMA rate was 0.03% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate risk as compared to fixed rate debt.



Investment Income

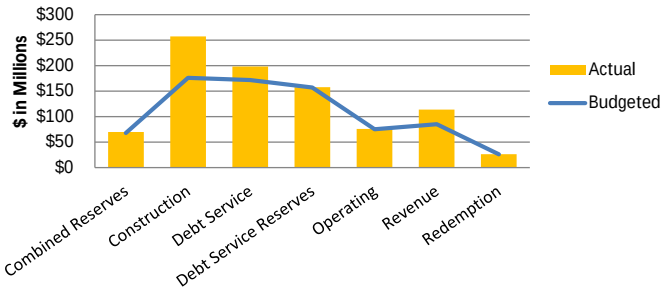
4th Quarter – FY21

Year To Date



	YTD BUDGET VARIANCE ($000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	$24	($301)	(277)	-33.3%
Construction	$203	($183)	19	4.4%
Debt Service	$67	($144)	(78)	-18.1%
Debt Service Reserves	$7	($458)	(451)	-18.3%
Operating	$3	$37	40	11.3%
Revenue	$104	($139)	(35)	-11.4%
Redemption	$1	($145)	(145)	-43.4%
Total Variance	$407	($1,333)	($926)	-17.9%

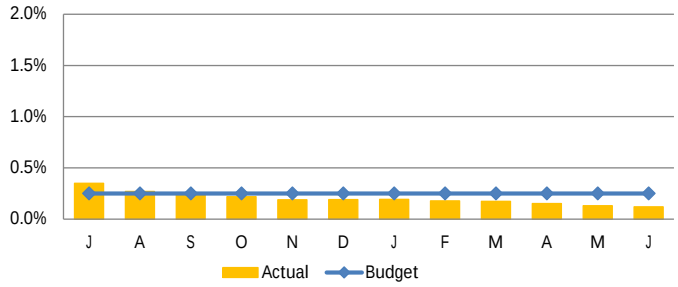
YTD Average Balances Budgeted vs. Actual



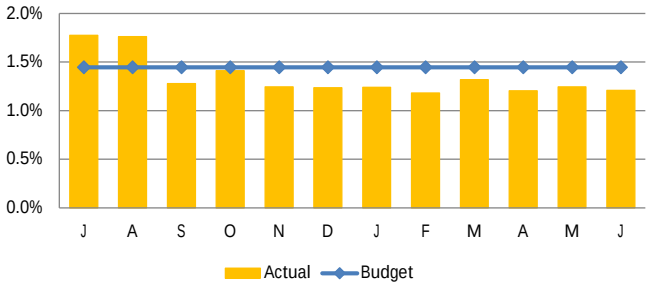
YTD Average Interest Rate Budgeted vs. Actual

Monthly

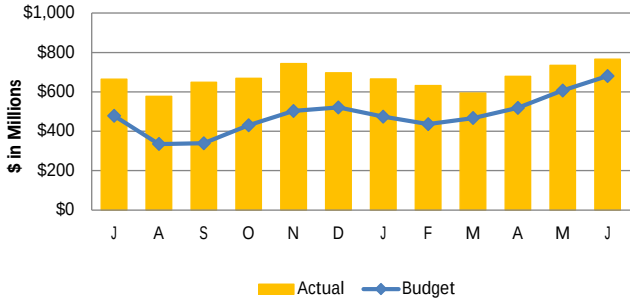
Short -Term Interest Rates



Long -Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances