MASSACHUSETTS WATER RESOURCES AUTHORITY

# Board of Directors Report

on

# Key Indicators of MWRA Performance

**For**

## Fourth Quarter FY2008

| Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|
| | | | |

Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer
September 17, 2008

# Board of Directors Report on Key Indicators of MWRA Performance for Fourth Quarter FY2008

## Table of Contents



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


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

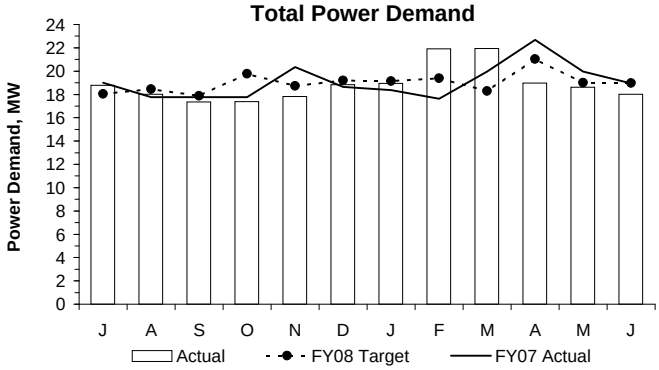
September 17, 2008

# OPERATIONS AND MAINTENANCE

# Deer Island Operations

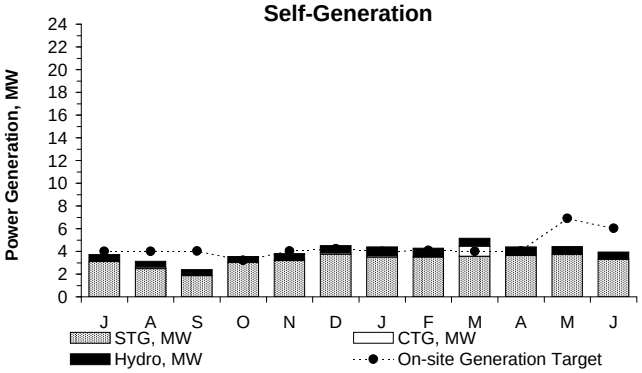
4th Quarter - FY08

### Total Power Demand



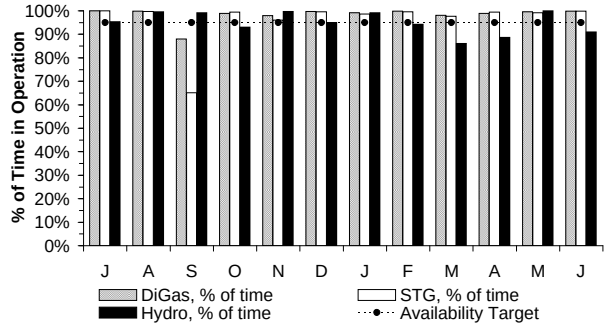

Total power demand for the 4th Quarter was slightly lower (-6%) than the FY08 target and lower (-9%) than in the same period in FY07, due to lower plant flows attributable to less-than-average rainfall.

### Self-Generation




Power generated on-site was 25% lower than the target. The target included anticipated operation of the CTGs during major storms and demand response events which historically have occurred during this quarter but did not this year. The average CTG generation target for the quarter was 1.7 MW, but actual average generation was 0.022 MW because the CTGs were only operated briefly on six (6) days for a total of 3.1 hours for maintenance/checkout purposes.The STG generated 10% higher than the target and the Hydro turbine systems' generation met its generation target for the quarter.

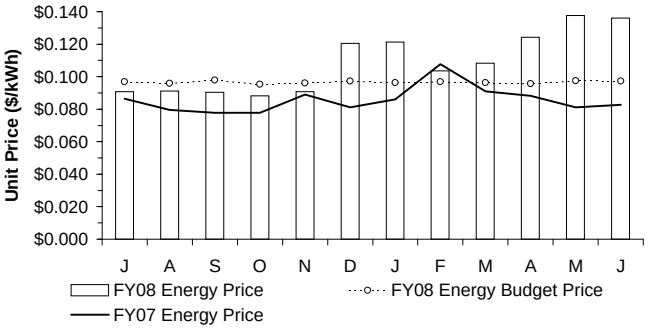
### Self-Generation Equipment On-Line




During the fourth quarter, the DiGas and STG systems exceeded their availability targets each month. In May, the Hydro turbine system exceeded its target. However in April and June, both hydro turbines were offline intermittently for repairs and scheduled maintenance. Contractors were on-site for two weeks in mid-June performing scheduled annual preventive maintenance on both hydro turbine systems.

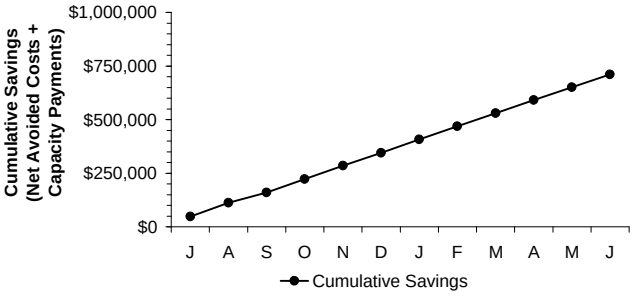
### Total Energy Pricing

**(includes spot energy price, ancillary costs, and NSTAR's transmission & distribution costs)**



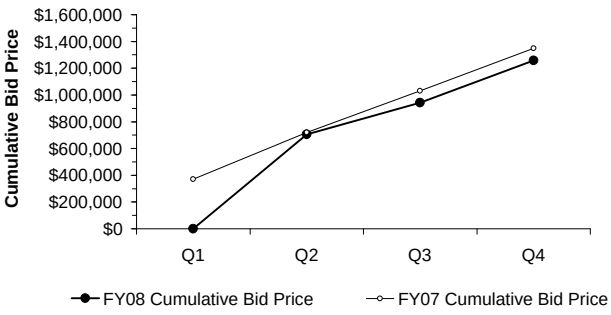

Under the current energy supply contract, all of DI's energy is purchased in real time. The total energy price in the 4th Quarter was 37% above the FY08 target for the quarter due to higher than budgeted spot energy prices and NSTAR T&D prices. The total energy price includes spot energy price, transmission & distribution charges, and ancillary charges. Please note the May and June total energy prices are estimates as the invoices have not been received.

### Load Response Program




Deer Island did not participate in any demand response events during the 4th Quarter of FY08; no events have been called in FY08. DI participates in the ISO-New England Load Response Programs. By agreeing to have its Combustion Turbine Generators available to run and thus relieve the New England energy grid of DI's load during times of high energy demand or high pricing, MWRA receives monthly Capacity Payments from ISO-NE. When it runs the CTGs at ISO-NE's request, DI receives energy payments from ISO-NE and also avoids NSTAR transmission and distribution charges. "Net Avoided Cost" is the avoided NSTAR payments offset by the cost of running the CTGs, and the energy payments from ISO-NE. Cumulative savings are the sum of Net Avoided Costs and montly Capacity Payments.

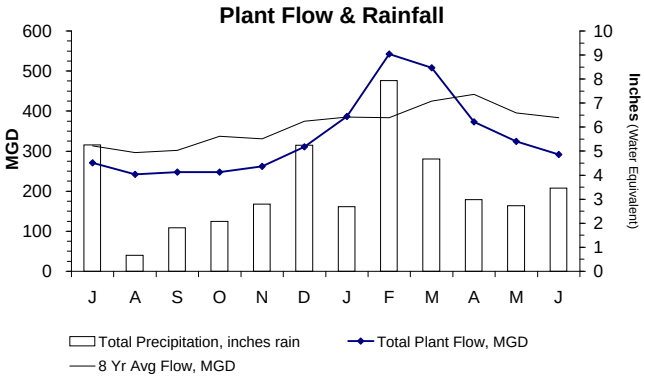
### MA Renewable Portfolio Standard



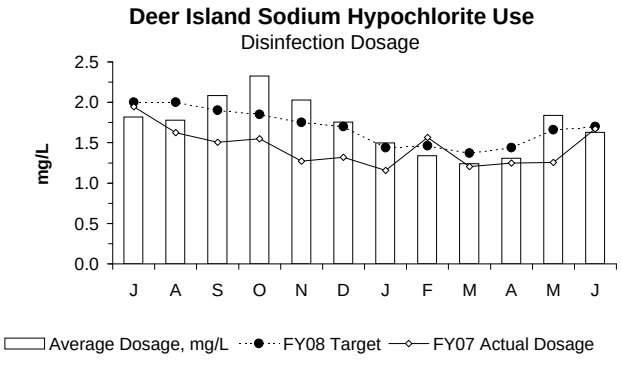

Bids were awarded in June during the 4th Quarter of FY08 for the sale of 6,306 REC's, for a total value of $315,300. No bids were received in April or May. Prices reflect the bids on the date that bids are accepted. The cumulative bid price reflects the total value of bids received to date. The cumulative total revenue received from the sale of these certificates in FY08 was $1,258,076.

# Deer Island Operations

4th Quarter - FY08




Total Plant Flow for the 4th Quarter was 19% lower than the 8-year average flow (329.9 mgd actual vs. 406.8 mgd expected) as precipitation was 26% less than the 8-yr average for the quarter (9.17 inches actual vs. 12.32 inches expected). Overall for FY08, Total Plant Flow was 8% lower than expected and 5% lower than the FY07 actual Total Plant Flow. However, overall precipitation for FY08 (42.33 inches) was very similar to both the 8-year average (42.41 inches) and to the FY07 actual (42.30 inches).



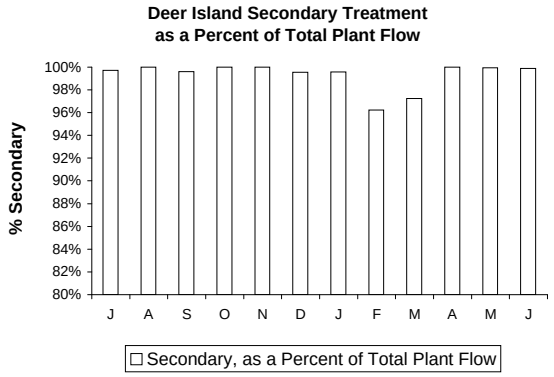

The disinfection dosing rate was consistent with the FY08 target for the 4th Quarter and was 14% higher than the FY07 actual dosage. The disinfection dosing rate for FY08 was within 2% of the overall FY08 target and was within 5% of the target during each quarter of FY08.

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

## Secondary Blending Events

| Month | Count of Blending Events | Count of Blending Events Due to Rain | Count of Blending Events Due to Non-Rain-Related Events | Secondary, as a Percent of Total Plant Flow | Total Hours Blended During Month |
|---|---|---|---|---|---|
| J | 1 | 1 | 0 | 99.7% | 3.20 |
| A | 0 | 0 | 0 | 100.0% | 0.00 |
| S | 1 | 1 | 0 | 99.6% | 4.91 |
| O | 0 | 0 | 0 | 100.0% | 0.0 |
| N | 1 | 1 | 0 | 100.0% | 2.17 |
| D | 3 | 2 | 1 | 99.6% | 5.73 |
| J | 1 | 1 | 0 | 99.6% | 6.30 |
| F | 10 | 10 | 0 | 96.2% | 89.66 |
| M | 5 | 5 | 0 | 97.2% | 64.41 |
| A | 1 | 1 | 0 | 100.0% | 2.44 |
| M | 1 | 1 | 0 | 99.9% | 1.93 |
| J | 3 | 3 | 0 | 99.9% | 4.97 |
| Total | 27 | 26 | 1 | 99.3% | 185.7 |

There were a total of five separate blending events on five days for a total of 9.4 hours during the 4th Quarter. All blending events during the 4th Quarter were due to heavy rain storms. The longest duration of continuous blending during the quarter occurred on June 27th when localized torrential rainstorms caused a blending event that lasted 2.54 hours and resulted in 7.13 mgal of blended flow.




Overall, 99.9% of the total plant flow to DITP was treated through secondary treatment during the 4th Quarter. The Maximum Secondary Capacity for the entire quarter was 700 MGD.

# Deer Island Operations & Maintenance Report

**Environmental/Pumping:**

Precipitation for the 4th Quarter of FY08 was much lower than the 8-year historical average for the quarter with a total of 9.17 inches of precipitation falling on 27 days.

The plant achieved a maximum average hourly flow rate for the quarter of 841.8 mgd on May 27th as a result of a sudden torrential downpour that produced 0.99 inches of precipitation during a relative short period of time. Plant flow just prior to the rain event was approximately 300 mgd and quickly increased to the peak plant flow within 1.5 hours after the start of the rain event. Pumping and treatment operations continued without incident throughout this storm event and throughout the entire 4th Quarter.

## Deer Island Operations & Maintenance Report (continued)

**Secondary Treatment:**
Annual turnaround maintenance was performed on Cryo Train 2 at the Cryogenic Oxygen Facility during the last two weeks of April. This turnaround maintenance is performed on roughly half of the components and systems in the facility and allows the remaining half of the facility to continue to operate and produce oxygen uninterrupted.

Mole sieve media adsorbent was changed out in all four mole sieve vessels at the Cryogenics Facility in June. Mole sieve media is used to remove moisture, carbon dioxide, and hydrocarbons from the process air stream prior to its introduction into the "cold box". These compounds need to be removed from the air stream to prevent downstream problems in the cold box and heat exchangers resulting in shutdowns in the cryogenics process. The new mole sieve media is 20% more absorbent than the old media. An additional layer of activated alumina was also added to the mole sieves as additional protection against moisture intrusion into the cold boxes.

**Disinfection:**
The internal linings of Sodium Hypochlorite Storage Tanks 2 and 4 are scheduled to be replaced this calendar year due to normal and expected deterioration in the lining as a result of age. The relining of Tank 2 is currently in progress; Tank 4 work will not begin until after the Tank 2 is nearing completion.

The two sodium hypochlorite mixers in both the East and in the West Disinfection Basins were repaired and replaced in May and June. These large mixers are used to provide thorough mixing of the treated wastewater with the sodium hypochlorite during the disinfection process.

**Odor Control:**
The activated carbon media in a total of five carbon adsorber units were changed out in May as part of routine maintenance to replace spent carbon. The carbon change out took place within three of the five odor control facilities and should result in improved treatment efficiency. Carbon was changed out in two adsorber units each in both the West Odor Control and East Odor Control facilities and in one adsorber unit in the Residuals Odor Control facility.

**Energy:**
The Deer Island photovoltaic (solar panel) project was commissioned in May and is going through final contract closeout. The 100-kW, roof-mounted system sited on the Residual/Odor Control Building has been producing power since commissioning.

## Clinton Wastewater Treatment Plant

**Soda Ash System Replacement Project:** Contractor (Methuen Construction) is nearly finished. The temporary feed system has been working satisfactorily throughout construction. Testing of the new system has begun and should be completed by the end of July.

**Digester Cleaning and Rehabilitation Project:** Work on this project has begun. Site visits by representatives of cleanout and equipment companies have begun. Construction is not likely to begin before spring FY09.

**Plant Upset:** The plant exhibited signs of an upset during the quarter. TRAC was alerted and began mobilizing samplers and investigators to address the problem. Illegal septage dumping was an early suspect. At about the same time, plant staff noticed spikes in flow from the Lancaster side of the system and reported their findings. The problem was addressed in a meeting with Lancaster Sewer District Commissioners. Pump station operations and problems were the cause and are being addressed.

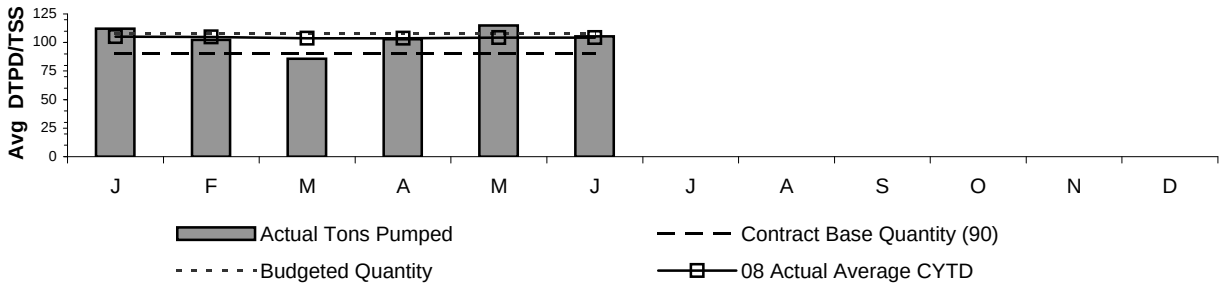
**Operations and Maintenance:** Staff completed all planned maintenance task orders during the 4th Quarter. Staff also performed a number of addtional maintenace tasks during the quarter, including: **Primary** - Resetting a tripped clutch on Primary Collector 2; serviced Primary Tank 2; lubricated the drive chain and sprocket; removed a blockage from the suction side of Primary Pump 2. **Gravity Thickener** - Unplugged the skimming trough and repaired a broken skimming arm Gravity Thickener 1. **Trickling Filter -** Cleaned the spray nozzles and lubricated the center column. **Dewatering Building -** Removed unused oils from oil storage room and eliminated old storage containers; replaced the upper and lower belts on Belt Filter Press 2; adjusted the packing on Thickened Sludge Pump ; and replaced the level control probes and control board on the polymer makeup system. **Chemical Building** - Replaced a flex coupling on Return Activated Slude P 2; flushed the soda ash dosing line; replaced a low pressure air blower for the contact chamber; replaced a gear drive box on the soda ash dispensing system; replaced the polymer tank's digital level gauge and replaced the probes on the polymer system. **Digester Building -** Replaced belts and purged the motor on the gas compressor; unclogged Recirculation Pump 1; and replaced a belt on Recirculation Pump 2.

# Deer Island Residuals

4th Quarter - FY08

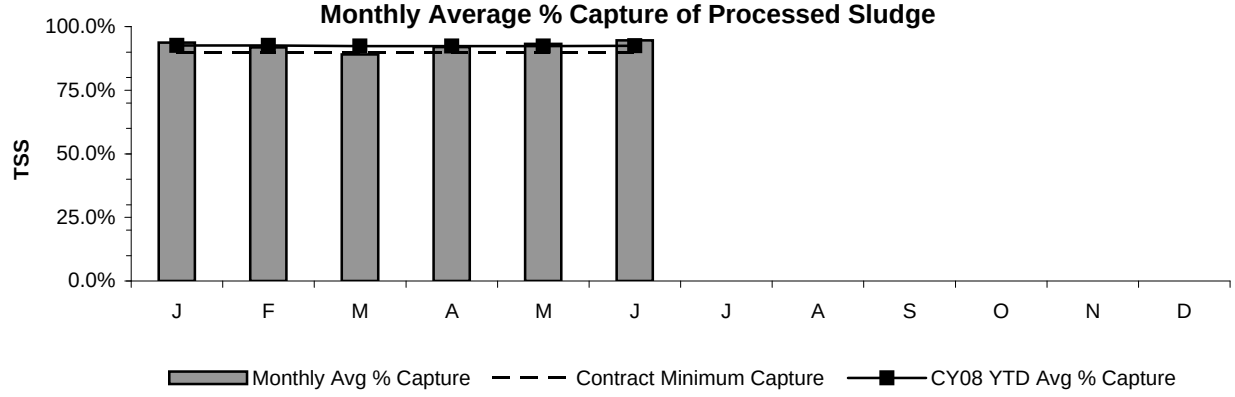
MWRA pays a fixed monthly amount for the calendar year to process up to 90 DTPD/TSS as an annual average. The monthly invoice is based on 90 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional payments are made on any quantity above the base amount. The base quantity of 90 DTPD/TSS was set for the 15-year term of the contract, even though, on average, MWRA processes more than 90 DTPD/TSS each year (FY08's budget was 108 DTPD/TSS).

## Sludge Pumped From Deer Island




The average total quantity of sludge pumped for the 4th Quarter was 108 DTPD, which was right in line with the FY08 budget. Sludge quantities can vary based on flow and changes in sludge inventory, as well as the performance of primary and secondary treatment. Upset conditions can also affect sludge quantities.

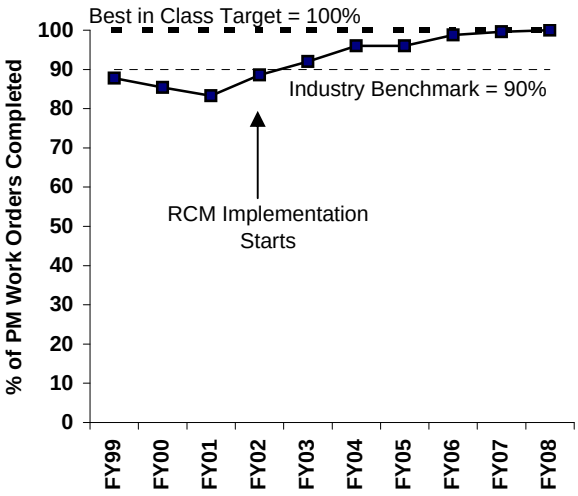
## Monthly Average % Capture of Processed Sludge




The daily average percentage of total suspened solids captured continued to be steady during the quarter and well within the contract range. The contract requires NEFCo to capture at least 90% of the solids delivered to the facility.

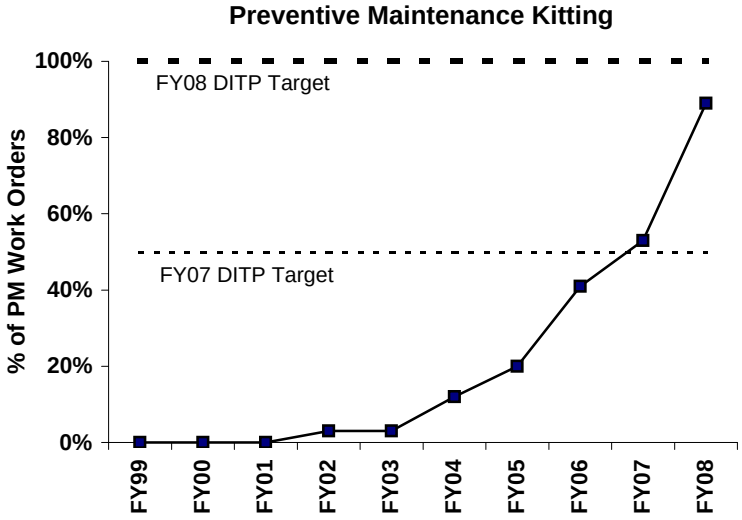
# Yearly Maintenance Metrics
## Proactive and Productivity Measures

### Preventive Maintenance



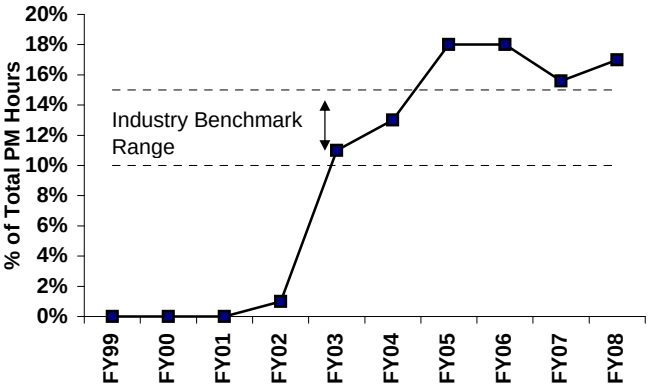

The industry benchmark is 90% PM completion. Upon reaching the 90% goal in FY02, the goal was raised to the best in class standard of 100% PM completion. Since then, the percent of PM work order completion has been on an upward trend. Reliability-Centered Maintenance (RCM) and Preventive Maintenance (PM) optimization efforts continue. In FY08, PM completion was 99.9%. This is an increase of 0.3% from FY07.

### Preventive Maintenance Kitting



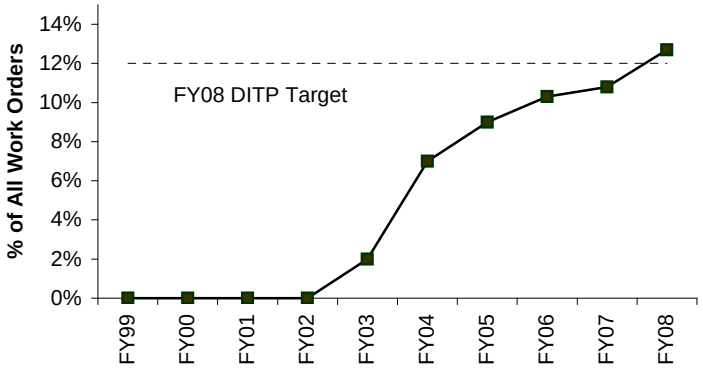

In an effort to increase wrench time, staff have been developing a process to "kit" all preventive maintenance work orders. Kitting is considered a best practice by maintenance and reliability professionals, and entails staging parts necessary to complete maintenance work. Kitting allows maintenance staff to spend more time "turning the wrench" rather than waiting for parts at the stockroom window. The process of kitting parts was developed in FY03; in FY04, all PM inventory items were loaded into Maximo so that parts for equipment could be assigned to work orders on a monthly basis. The percent of PM work orders completed has been on an upward trend since FY03. DITP reached 89% in FY08 by electronically kitting HVAC filters and lubrication items.

### Operations Light Maintenance




To improve maintenance program efficiency, Operations staff rather than Maintenance staff perform some light maintenance functions. Preventive maintenance work order hours completed by Operations has increased from less than 1% of total PM hours in January 2002 to the current mark of 17%. DI reached the industry benchmark range of 10-15% in April 2003 and has exceeded the goal through FY08. Approximately 671 hours per month of PM hours are completed by Operations staff. A decrease occurred in FY07 due to a PM optimization process that eliminated low value operator PM tasks.

### Predictive Maintenance

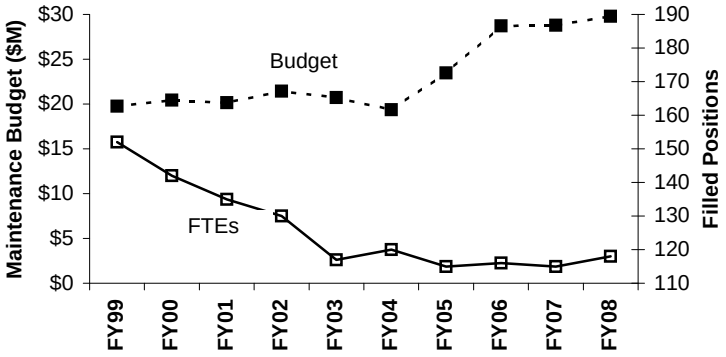



Predictive maintenance work orders have steadily increased from 0% in FY02 to 12.7% in FY08. An increase in predictive maintenance activities was achieved through the expansion of the existing lubrication, vibration, and acoustic ultrasonic analysis programs. DITP is starting to develop and implement the use of thermal imaging on equipment. The effort to continue to increase predictive maintenance work orders will continue in FY09.

# Yearly Maintenance Metrics

## Overall Maintenance Program Measures

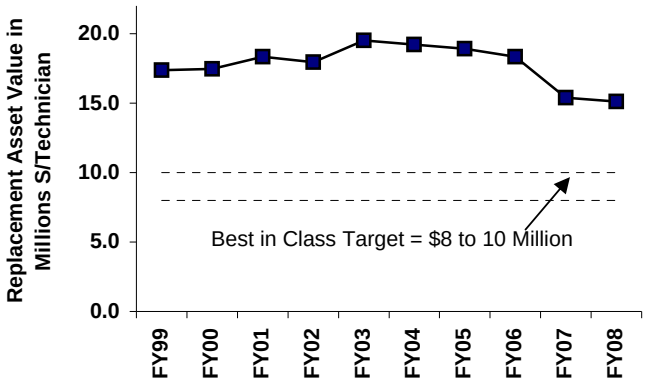
### Maintenance Budget and FTEs




The number of FTEs has steadily decreased over time through staff attrition. Maintenance has been successful in meeting its goals through implementation of numerous maintenance efficiencies including Operations staff performing light maintenance, cross-functional flexibility, and Reliability Centered Maintenance (RCM).

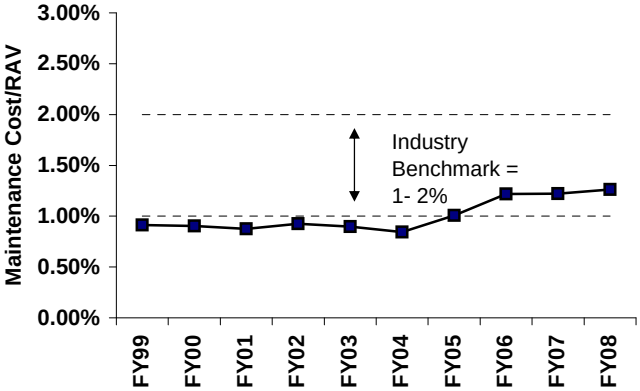
The maintenance budget has and will continue to increase in order to ensure proper maintenance of plant assets as they age, and, as necessary, replacement once they become obsolete. In FY08, overall spending was slightly higher than in FY07.

### Replacement Asset Value / Maintenance Technician



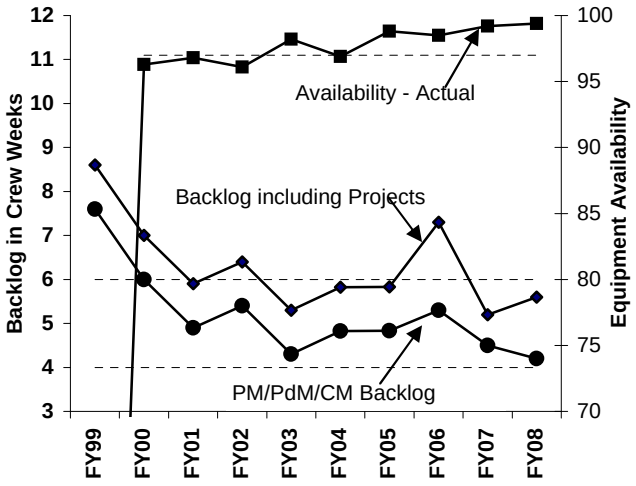

This metric is used to benchmark maintenance staffing. DITP has adopted a world-class target of $8-10 Million/Technician. DITP exceeds the target at this time. As the plant ages and additional maintenance is required, additional technicians will be required to provide adequate care for plant assets. In FY08, additional outside services supplemented maintenance staffing resulting in an slightly lower value.

### Maintenance Cost / Replacement Asset Value



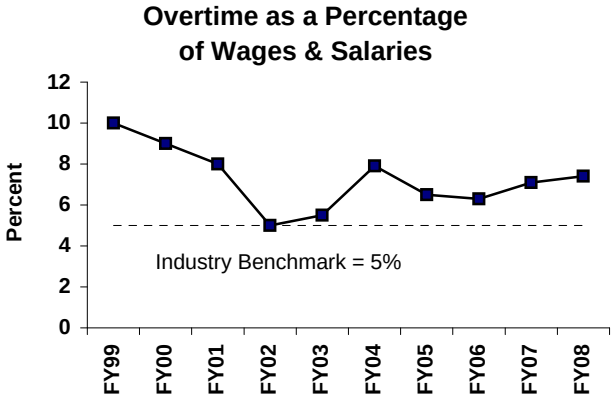

This metric is used to determine if annual maintenance spending is within the industry benchmark of between 1% to 2.0% of replacement asset value. The plant replacement asset value was calculated to be approximately $2.5 billion dollars. DITP's current maintenance spending is within the target range. Additional spending is expected to be required as the plant ages and additional equipment replacements are required.

### Backlog and Availability

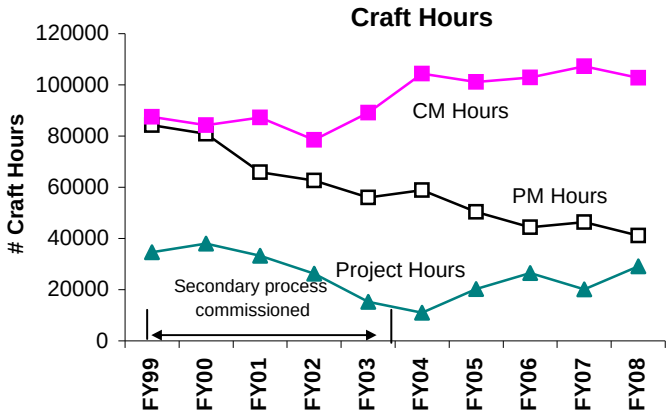



The industry benchmarks for equipment availability is 97% and for maintenance backlog is 4 to 6 weeks. The equipment availability goal has been met the last four years and was 99.4% for FY08, an increase of 0.2% from FY07. The total backlog average for FY08 was 6.0 weeks and at year end was 5.6 weeks. The overall backlog increased slightly in FY08 because of an increase in project hours, which is attributed to performing more project work in-house.

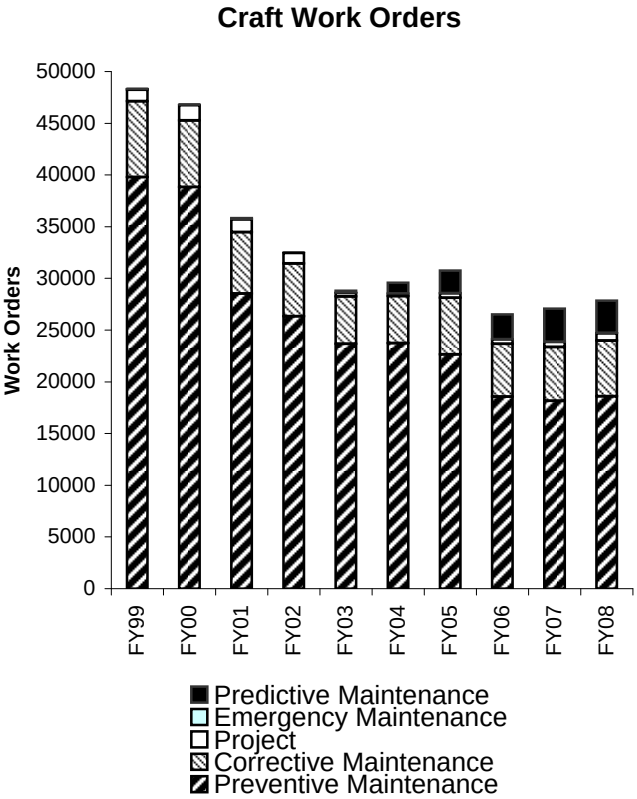
# Yearly Maintenance Metrics
## Overall Maintenance Program Measures




Overtime in FY03 to FY08 is over the industry benchmark due to the loss of staff from internal transfers and resignations, which resulted in short- term increases in the maintenance backlog. Additionally OT expenditures in FY08 were required to support high flow events.




Optimization of the preventive maintenance program through the transfer of some light maintenance tasks to Operations staff (17% of PM hours at the end of FY08), elimination of duplicate work orders, decreasing PM frequency due to equipment history and performance, completion of a PM Optimization effort in FY05, and RCM recommendations have resulted in a significant decrease (43,122 hours) of PM craft hours from FY99 to FY07. The CM hours decreased from FY07 to FY08 by 4,539 hours while the project hours increased by 8,952 hours. The increase in project hours is attributed to performing more project work in-house.

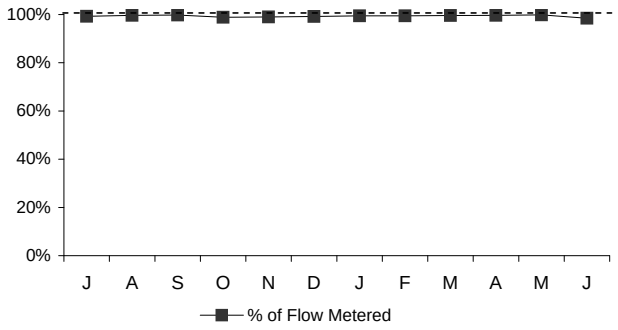



There were 27,847 work orders in FY08, an increase of 776 or 3%, of which 439 were preventive maintenance work orders. The five-year inspections for secondary process equipment also made up a significant percentage of the increase. The number of emergency maintenance work orders grew from 4 to 32.

# Operations Division Metering
## 4th Quarter - FY08

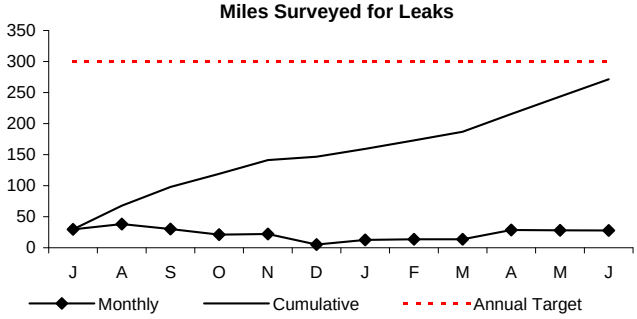
## WATER METERS

**Percent of Total Revenue Water Deliveries Calculated Using Meters**




The target for revenue water deliveries calculated using meters is 100%. During the 4th Quarter, meter actuals accounted for 99.4% of flow; only 0.6% of total revenue water deliveries were estimated. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and/or capital construction projects. The following is the breakdown of estimations:
In-house/Capital Construction Projects - 0.06%
Instrumentation Failure -0.58%

**Miles Surveyed for Leaks**



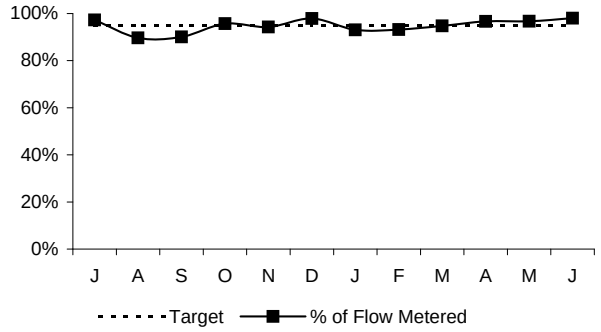

The total number of miles surveyed for leaks during the 4th Quarter was 84.63; the final total for FY08 was 271.41 miles, just below the target of 300.

| Month | J | A | S | O | N | D | J | F | M | A | M | J |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leaks Detected | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leaks Repaired | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Backlog | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Avg. Lag Time (days) | 0 | 8 | 34 | 34 | 29 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 |

The leak backlog for the quarter and for FY08 was zero. The Pipeline Program's goal is to repair all leaks found during the fiscal year.

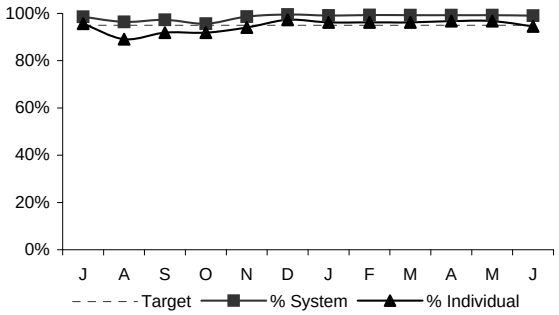
## WASTEWATER METERS

**Percent of Total Wastewater Transport Calculated Using Meters**




The target for revenue wastewater transport calculated using meters is 95%. Estimates are generated for meters missing data due to instrument failure and/or erratic meter behavior. Estimates are produced using data from previous time periods with similar flow conditions. During the 4th Quarter, only 2.85% of the total flow was estimated.

**% METER UPTIME**




For the 4th Quarter, out of a possible 561,696 data points, only 4,213 points were missed resulting in a system-wide up time of 99.25%. Staff continue to work with meter system vendors to improve performance and reduce estimates. Of the 183 revenue meters installed, on average seven experienced down time greater than the 5% target (four were removed temporarily for community maintenance access), resulting in an average of 96.0% individual meter uptime. For the 4th Quarter, down time for an individual meter is defined by any individual meter having less than 2,766 data points.

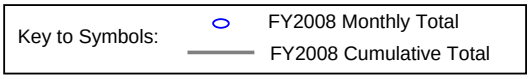
# Water Distribution System Valves
## 4th Quarter - FY08

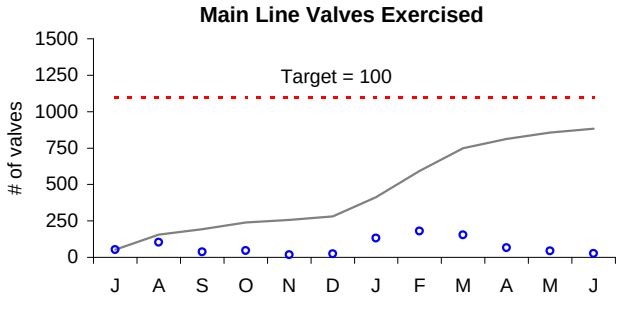
### Background

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.

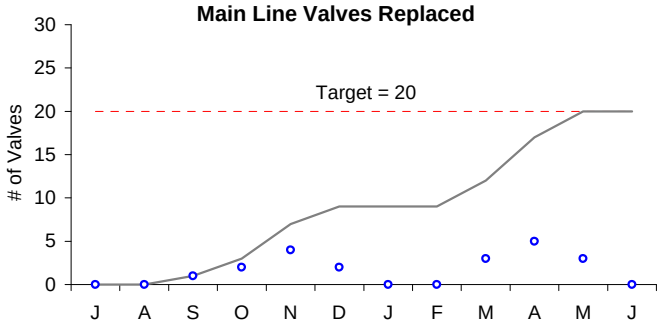
Main line valve exercising has been down somewhat this fiscal year because of the need to assign valve staff to other higher-priority projects. Valve staff have spent time rebuilding two control valves (Oak Hill Control Valve and Shaft 9 PRV ); working on major flushing projects to re-activate long-isolated segments of the Spot Pond East and West Supply Mains on Beacon St. in Brookline to the Shaft 7B PRV Vault at Chestnut Hill; and flushing Sections 4, 5, 6, 11 and 12 NLS Mains in Somerville and Medford to switch supply to Somerville Meters 33 and 91 from the Shaft 8 NLS PRV supply source to the Shaft 9A NLS PRV supply source. Staff also have been required to provide extensive support on other major valve replacement projects on NHS Sections 13, 48 and 70, as well as other CIP projects.

| Type of Valve | Inventory # | Operable Percentage | |
|---|---|---|---|
| | | FY08 to Date | FY08 Targets |
| Main Line Valves | 1,265 | 86.3% | 84% |
| Blow-Off Valves | 1,132 | 90.6% | 94% |
| Air Release Valves | 1,324 | 91.7% | 86% |
| Control Valves | 51 | 94.0% | 92% |

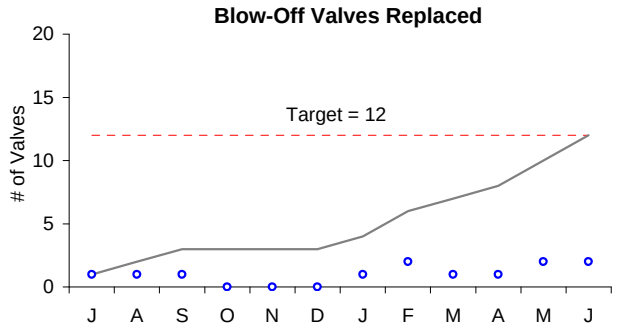


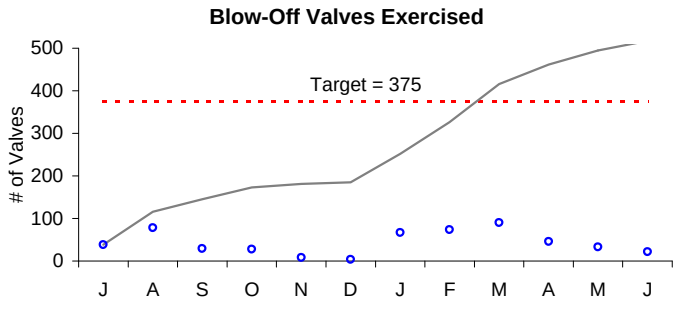

During the 4th Quarter, staff exercised 135 main line valves, which brought the final total for the fiscal year to 883.




During the 4th Quarter, eight main line valves were replaced bringing the final total for the fiscal year to 20.




Staff replaced five blow-off valve during the 4th Quarter. The final total for FY08 was 12.




Staff exercised 101 blow-off valves this quarter, which brings the total for the fiscal year to 517.

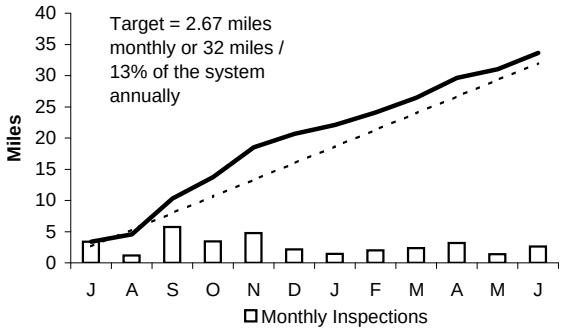
# Wastewater Pipeline and Structure Inspections and Maintenance

## 4th Quarter - FY08

YTD Actual ——
Target - - - - - - - - -

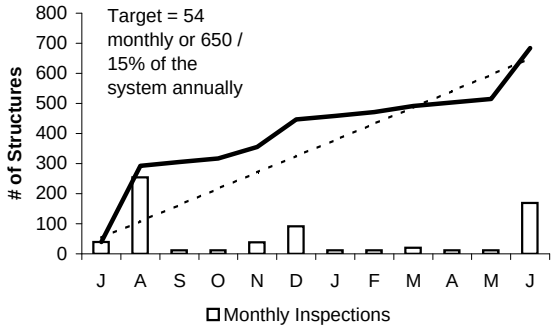
## Inspections

### Pipeline Inspections



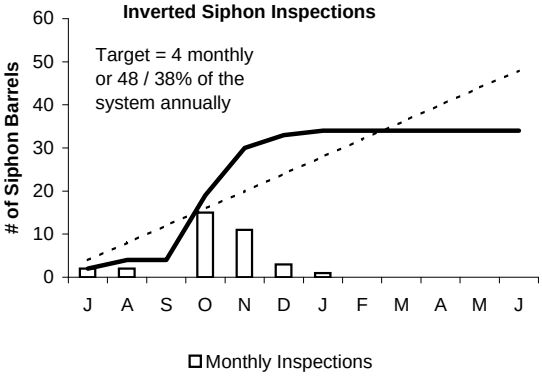

Staff internally inspected 7.2 miles of MWRA sewer pipeline in this quarter. Staff also inspected 1.34 miles of community pipeline as part of the Community Assistance Program.

### Structure Inspections




Staff inspected 193 structures during the 4th Quarter, including the 12 CSO structures.

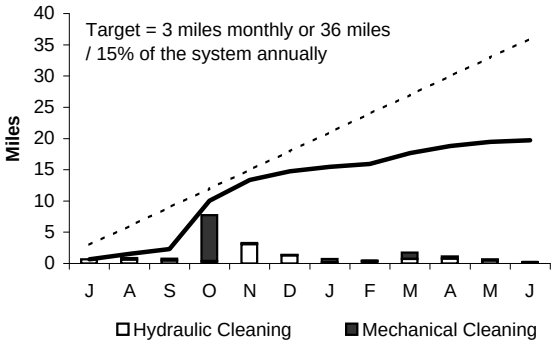
### Inverted Siphon Inspections




No siphon barrels were inspected this quarter; the total for the fiscal year was 34.

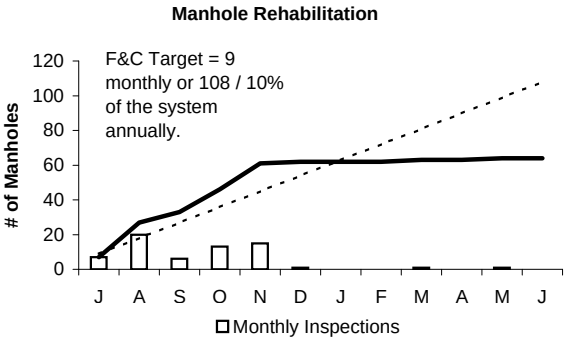
## Maintenance

### Pipeline Cleaning



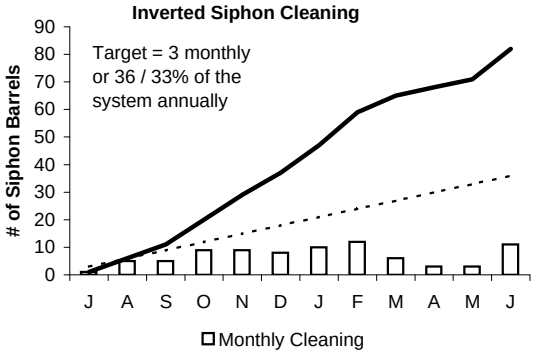

Staff cleaned 2.08 miles of MWRA's sewer system and removed 146.5 cubic yards of grit and debris during the 4th Quarter. In addition, staff cleaned .60 miles of community pipeline as part of the Community Assistance Program.

### Manhole Rehabilitation




As part of the Manhole Rehabilitation Program, staff replaced one manhole frame and cover this quarter; no manholes were rehabilitated although one head house was resealed. Masons were assigned to Facility Maintenance for this quarter.

### Inverted Siphon Cleaning

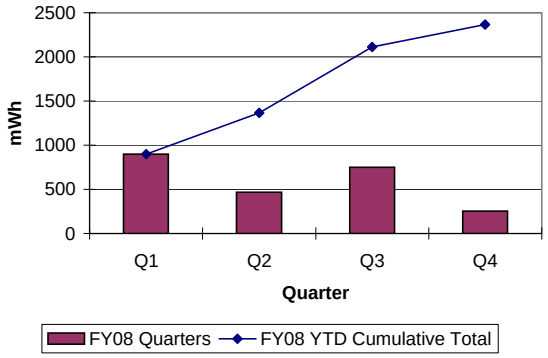



Staff cleaned 17 siphon barrels during the 4th quarter bringing the total for the fiscal year to 82.

# Field Operations Hydroelectric Generation Quarterly Report

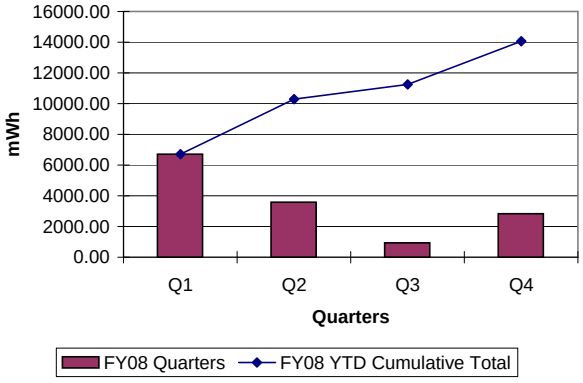
**4th Quarter - FY08**

**Quarterly Totals for Hydro Production at Cosgrove Hydroelectric Generation Facility**




In the 4th Quarter, the Cosgrove Hydroelectric Station generated a net of 252 mWh, with revenue of $20,097. Generation was down compared to the same quarter last year because PCB abatement work at Cosgrove, which began in late April and lasted through June, shut the station down. However, generation in the 2nd and 3rd Quarters of FY08 was higher than in previous years because staff kept some flow going through Cosgrove during the winter months when the Carroll Water Treatment Plant was at half-plant operation. Therefore, the final total revenue generated at the station in FY08 - $147,846 - was only 27% lower than in FY07.

**Quarterly Hydro Production at the Oakdale Hydroelectric Generation Facility**




In the 4th Quarter, Oakdale Station's hydroelectric plant generated 2,829 mWh, resulting in $270,078 in revenue. Generation this quarter was 26% higher than during the same quarter in FY07. Overall, generation in FY08 was 28% higher than in FY07, mainly due to the fact that it was drier during the first two quarters of FY08 than the previous year. Therefore, more water had to be transferred from the Quabbin to the Wachusett. The total revenue generated in FY08 at Oakdale was $1,093,794. (Oakdale's operating protocol dictates that power is generated when water is transferred from Quabbin to Wachusett unless conditions result in flows that are in excess of generating capability.)

## Energy Program Highlights

MWRA Wind Power Consultant: Black & Veatch continues to work on the Nut Island turbine, including interconnection issues and permitting.

Loring Road Hydroelectric Generation Feasibility Study: Design work began in the 4th Quarter.

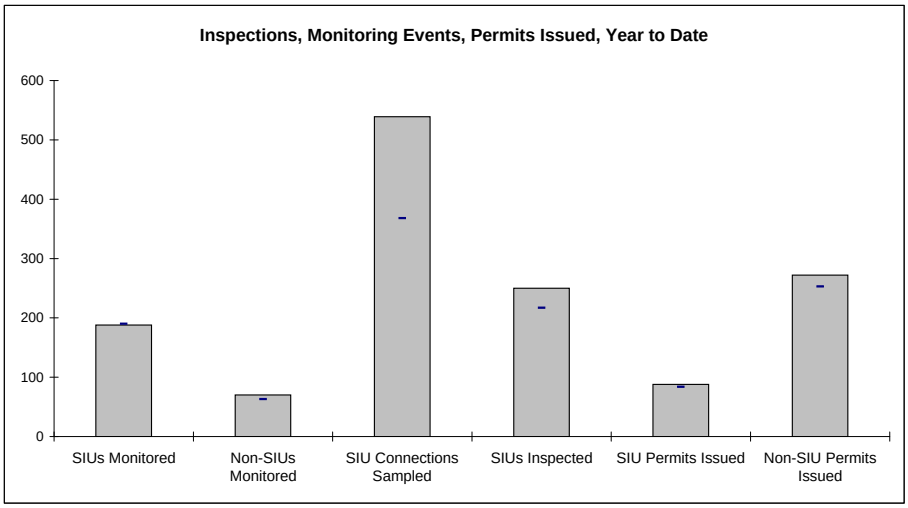
CWTP Energy Audit: National Grid (NGRID) and its contractor continued the audit. Staff expect final recommendations in the 1st Quarter of FY09.

CWTP Lighting Audit: Staff continue with implementation of recommendations.

Chelsea Facility Energy Audit: A final audit report was submitted to MWRA in June that details the easy-to-implement energy savings options and those that require further study. Staff will work with NSTAR and its contractor during the 1st Quarter of FY09 to determine which recommendations to implement and how to proceed with the options for further study. NSTAR is the energy provider for the Chelsea Facility and will provide automatic rebates for up to 50% of any energy-saving measure implemented as a result of the audit.

# Toxic Reduction and Control

4th Quarter - FY08




EPA Required SIU Monitoring Events
for FY08: 190
YTD : **188** *

Required Non-SIU Monitoring Events
for FY08: 63
YTD : **70**

SIU Connections to be Sampled
For FY08: 368
YTD: **539**

EPA Required SIU Inspections
for FY08: 217
YTD: **250**

SIU Permits due to Expire
In FY08: 84
YTD: **88**

Non-SIU Permits due to Expire
for FY08: 253
YTD: **272**

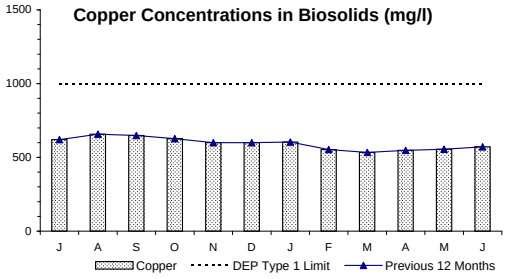
Significant Industrial Users (SIUs) are MWRA's highest priority industries due to their flow, type of industry, and/or their potential to violate limits. SIUs are defined by EPA and require a greater amount of oversight. EPA requires that all SIUs *with flow* be monitored at least once during the fiscal 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.

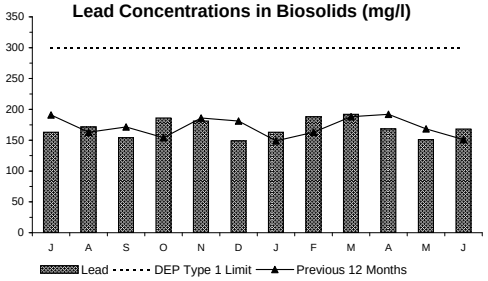
The annual goal is set at the beginning of the fiscal year but it can fluctuate due to the actual number of SIUs at any given time. During the course of the year, some SIUs do not discharge and cannot be monitored. In FY08, all SIUs that had a discharge were sampled except for those that shut down operations before they could be scheduled. *There were a net of two SIUs that met this scenario in FY08. TRAC's monitoring plan requires one additional sampling event for 40% of the SIUs and two additional sampling events for 10% of the SIUs. TRAC also monitors one-third of the non-SIUs each year.

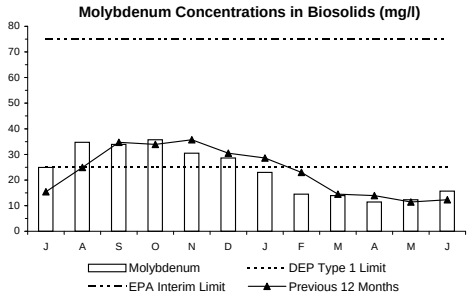
SIU and Non-SIU permits are issued with durations of two to five years, depending on the category of industry, varying the number of permits that expire in a given year.

| Number of Days to Issue a Permit | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0 to 120 | | 121 to 180 | | 181 or more | | Total Permits Issued | |
| | SIU | Non-SIU | SIU | Non-SIU | SIU | Non-SIU | SIU | Non-SIU |
| Jul | 0 | 6 | 0 | 1 | 0 | 2 | 0 | 9 |
| Aug | 3 | 8 * | 1 | 2 | 0 | 1 | 4 | 11 |
| Sep | 6 | 9 | 0 | 2 | 0 | 1 | 6 | 12 |
| Oct | 8 | 20 | 2 | 4 | 0 | 1 | 10 | 25 |
| Nov | 5 | 20 | 1 | 2 | 6 | 4 | 12 | 26 |
| Dec | 6 | 33 | 1 | 0 | 0 | 0 | 7 | 33 |
| Jan | 12 | 53 | 2 | 4 | 1 | 4 | 15 | 61 |
| Feb | 4 | 17 | 0 | 1 | 0 | 1 | 4 | 19 |
| Mar | 2 | 11 | 1 | 1 | 0 | 1 | 3 | 13 |
| Apr | 8 | 19 | 1 | 0 | 1 | 6 | 10 | 25 |
| May | 12 | 17 | 0 | 0 | 0 | 7 | 12 | 24 |
| Jun | 5 | 12 | 0 | 2 | 0 | 3 | 5 | 17 |
| % YTD | 81% | 82% | 10% | 7% | 9% | 11% | 88 | 275 |

EPA requires MWRA to issue or renew 90% of SIU permits within 120 days of receipt of the application or the permit expiration date - whichever is later. EPA also requires the remaining 10% of SIU permits to be issued within 180 days.
* TRAC also issued 318 Group Permits to printers and photoprocessors in August 2007.




Copper, lead, and molybdenum are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. Cooling tower usage typically causes a seasonal spike in molybdenum concentrations due to the blowdown on large AC systems that use corrosion inhibitors containing molybdenum. Levels drop again following the end of the cooling season. The hotter the season, the higher the spike. TRAC has an ongoing program to persuade cooling tower operators to switch to phosphate-based corrosion inhibitors. TRAC will continue its voluntary molybdenum reduction program, which has decreased influent loads significantly since 1995.

# Field Operations Highlights
## 4th Quarter - FY08

**Western Water Operations & Maintenance**

- Carroll Water Treatment Plant (CWTP): Staff upgraded the actuators on all eight of the influent channel sluice gates at the CWTP. The upgrade included an optical feedback unit to improve flow control through the plant. Staff performed medium- and high-voltage switching to support the electrical maintenance contractors. The contractors completed the annual 69-kV preventative maintenance in the substation and 13.8-kV preventative maintenance within the treatment plant. In addition, staff completed piping modifications to the sodium bisulfite system, installed new uninterruptible power supplies to back up the programmable logic controllers for SCADA, completed modifications to the water sample tap at the Cedar Hill Pumping Station and replaced the seal on the Plant Water Pump 1.

- Oakdale Power Station: Staff supported the contractor with switching and isolation of equipment as it performed preventative maintenance in the 66-kV substation. In addition, staff made repairs to the basket strainer on the cooling water system for the hydro turbine and replaced the motor that controls the hydro turbine governor's set point. On June 4, staff placed the hydro turbine on-line to start the Quabbin transfer and establish the Wachusett Reservoir interflow.

- Sudbury Reservoir Gatehouse: Staff completed an underwater inspection of Sluice Gate 7 with the remotely-operated camera. Staff exercised the valves that isolate the Sudbury Reservoir from the Weston Aqueduct. Staff also established flow to the Weston Reservoir from the Sudbury Reservoir as a test.

- Wachusett Dam: Staff supported the crest gate contractor with the tie in of the 13.8-kV electrical conduits. Staff witnessed the dry test of the new crest gate. Staff also installed a new access gate at the Grove Street entrance to the Lower Gatehouse.

- Wachusett Aqueduct: Staff freed up the bolts on the pressure relief structure of the Wachusett Aqueduct Extension. The pressure relief structure has three caps with 78, three-inch-diameter bolts each.

**Metro Water Operations & Maintenance**

- Dig Safe Pilot Program: The Dig Safe Pilot Program continues to function successfully. The pilot program is currently focused on Dig Safe notifications within the City of Chelsea for MWRA water pipelines. MWRA received 78 notices in the 4th Quarter, 20 of which were of an emergency nature; a total of nine mark-outs were required from the 78 notices.

- Phase 2 Pump Station Rehabilitation Contract: Work continues at Belmont, Brattle Court, and Hyde Park Pump Stations. One pump is available for normal operation at the Brattle Station. Spring Street and Newton Street Stations are both fully available and in service to supply water in conjunction with Brattle Court and Hyde Park, respectively. A pressure reducing valve or PRV that supplies water from the Northern Extra High Service Area to the Intermediate High Service Area is in service while the Belmont Pump Station is out of service for construction. The Arlington Covered Reservoir continues to provide the water storage in the Intermediate High Service Area during this period.

- Valve and Blow-Off Replacements: Water Pipeline met its fiscal year goals for valve replacements and blow-off retrofits.

**Wastewater Operations & Maintenance**

- Headworks: SCADA Contract CP-2 has commenced and work is ongoing at the Ward Street and Chelsea Creek Headworks.

- Pumping: The new Braintree/Weymouth Pump Station has been tuned over to MWRA by the contractor. The facility is being operated by from the Operations Control Center in Chelsea. This new facility will convey wastewater flows from Braintree and Weymouth to Deer Island.

*Technical Inspection*

- Staff inspected 7.2 miles of MWRA interceptors and 193 structures this quarter. Staff also inspected 1.34 miles of community pipeline as part of the Community Assistance Program.

**Wastewater Operations & Maintenance (Continued)**

*Wastewater Pipeline*

- Pipeline staff maintained 2.08 miles of MWRA interceptors and removed 146.5 yards of debris in the 4th Quarter. Staff also replaced one manhole frame and cover, re-sealed one head house and cleaned 17 siphon barrels. Staff cleaned .60 miles of community pipeline this quarter.

**TRAC**

- Framingham Extension Sewer (FES) Project: Monitoring staff resumed annual FES municipal sampling at 15 sites in April. The sampling will be performed monthly through November. In June, staff resumed sampling at six sites along the FES and downstream interceptors to evaluate sulfide, sulfate and BOD levels. This sampling will take place one week per month starting ending in the third week of November 2008.

- Clinton Wastewater Treatment Plant: Staff responded to an apparent plant upset condition and conducted sampling of the Clinton and Lancaster influent lines separately to determine if there was any toxic loading discharges that could affect the operation of the plant. Lancaster influent appeared to be a potential source, so sampling continued through June to narrow the possible sources. Meanwhile, Inspections staff contacted permitted sewer users in the Clinton Sewer Service Area to review operations and possible problem discharges. No users with MWRA permits were identified as sources. Staff conducted surveillance of various septage haulers in the area to see if illegal dumping of was occurring; no illegal dumping was found. Staff are evaluating sampling data and will summarize findings.

- Penalties: TRAC issued 12 Penalty Assessment Notices (PANs), totaling $6,450, to companies that failed to submit their annual G1 Compliance Reports or their annual silver sample results (or both) as required by the Group Permit for Photo Processing and Printing Operations (G1 Group Permit). The due date for filing the Compliance Reports and silver samples was March 31, 2008. The penalties range from $150 to $1,000.

- PAN Issued to Massachusetts General Hospital (MGH): On June 24, TRAC issued a $48,400 PAN to MGH resulting from its discharge of excessive levels of mercury into MWRA's sanitary sewer system in violation of MWRA's prohibition on the discharge of mercury. The PAN followed an earlier (July 18, 2006) Notice/Order to MGH for mercury. MWRA also issued a Supplemental Order to Comply along with the penalty. MGH has appealed the PAN to an Adjudicatory Hearing.

- PIMS Progress: The PIMS Project Team completed its Conference Room Pilot (CRP), and System Acceptance Testing and User Training. The consultant, IPS, is making final changes in response to the CRP Sessions, System Acceptance Testing and User Training, in preparation for Go-Live, which is planned for early to mid-August.

- Compliance/Enforcement - Settlement Agreement with Duralectra, Inc.: TRAC and Duralectra, Inc. entered into a Settlement Agreement, effective May 9, 2008 to resolve all issues related to the January 11, 2007 PAN issued for violations of Duralectra's Permit and MWRA regulations. The Settlement Agreement requires Duralectra to pay a $50,000 administrative penalty and pay stipulated penalties for a period of two years.

**Metro Equipment and Facility Maintenance**

*Equipment Maintenance Program*

- Pump Re-building: Mechanics replaced the rotating assembly on Pump 1 at the Newton Street Pump Station. Mechanics and Plumbers also replaced a pump at Cottage Farm; the old pump was returned back to the shop for restoration and to be used as a spare.

- Prison Point: Mechanics replaced the hydraulic motor and transmission on the dry weather flow screen. The original unit was more than 20 years old and was leaking fluid. Staff located a replacement for a fraction of the cost for a new unit.

- Nut Island Headworks: Mechanics disassembled Screen Shuttle Conveyor 2 and cleared an obstruction. Mechanical and Electrical staff worked together to repair Horizontal Grit Conveyor 1, which required a new motor. In addition, many rollers and bearings were replaced to ensure smooth and reliable operation.

- Chelsea Headworks: Mechanical staff began a major overhaul of the four collections channels. Collector chains were worn beyond repair. Approximately 2,200 feet of the chain

**Metro Equipment and Facility Maintenance (Continued)**

was removed and. While in the grit channels using confined space safety procedures, crews also replaced approximately 640 “shoes” (that guide the collectors along the rail). This phase of the overhaul will add significant operational reliability and reduce breakdowns.

- Hingham Pump Station: Mechanical staff installed a new 10-inch, 4.9-mgd Fairbanks Morse Pump and replaced the old unit installed in the early 1990s.

- Chelsea Facility Buildings: Plumbing crews replaced all flushometers in both the Administration and Maintenance Buildings; approximately 40 low-flow units were replaced during an off-shift. The new style units have replaceable parts, which will enable quicker repairs with reduced maintenance costs.

- Brattle Court Water Pumping Station: Staff repaired an automatic transfer switch, which transfers power to the generator in the event of a power loss.

- Alewife Brook Wastewater Pumping Station: Screen 2 was completely overhauled including new chain, upper shaft, bearings and bent rakes. Installation of “energy efficient “ lighting completed. Staff removed, rebuilt and reinstalled Pump Motor 3.

- Nut Island Headworks: Staff installed a split air conditioning system for the control room to allow better control of air temperature throughout the facility.

- Ward Street Headworks: Staff installed two new eyewash stations outside and replaced six eyewash stations inside.

*Grounds/Custodial Maintenance*

- Fence Work: Repairs were made to fences at Hough’s Neck Pump Station, Caruso Pump Station, Alewife Pump Station, and Delauri Station, Fells and Shaft 7. Additional fencing was installed at the new mezzanine storage in Chelsea for added security. Signs were installed at the Fells Reservoir.

- Grounds Work: Crews mowed and performed general lawn maintenance at several sites including Chelsea Headworks, DeLauri Pump Station, Cottage Farm, Prison Point, Fells Reservoir, Loring Road/South Gatehouse, Shaft 7, 7C, 7D. Shaft 9, 9A, Hayes Pump Station, Gillis Pump Station, Commercial Remote, Fox Point, and Squantum Pump Station. Crews also performed special projects at Nut Island - roto-tilling and seeding the wildflower bed, placing brick pavers at the flagpole island, and clearing brush at the front entrance overlooking the water. Improvements at Nut Island include removal of concrete at the entrance of the building and rebuilding to accommodate a drinking fountain. Handicapped parking spaces are being provided on the apron of the pier as well as a new gate to keep public vehicle traffic off the length of the pier.

*Facility Maintenance*

- Carpentry Work: Facility Specialists built a shed near the pier to store fertilizer product from the Pelletizing Plant and downspouts were replaced at the Alewife Brook Pump Station.

- Painting: The Dudley Road Pump Station interior was completely painted to protect against moisture and condensation on the new piping and pumps.

- Chelsea Administration Relocation Project: Carpentry staff constructed two new offices in the Administration Building as part of the relocation of the Payroll Unit. Staff also converted a conference room into office space and outfitted the old security offices to a new conference room.

- Masonry Work: Facility Specialists are still working on demolition and wing wall modifications at the Nut Island Fire Pump Building. The crew is lowering the walls and placing caps on the remaining knee walls using the existing bluestone. The brick face on the shaft structure walls at the Cottage Farm Facility is being re-pointed. The walls are located up on the high end of the grounds which are often exposed to prevailing winds.

**Metro Equipment and Facility Maintenance (Continued)**

- Intermediate Pump Station Lightening Protection Repairs: Staff reinstalled lightening rods that had become detached from the roof.
- Water Crossing Signs: Grounds Crews are installing new eight-foot by four-foot water crossing signs that were produced in-house at significantly less cost than purchasing new ones. This is the first attempt at in-house sign making this large. The signs have been treated with a new graffiti-resistant coating.
- Graffiti Removal: Graffiti was removed at Nut Island by accessing the roof. Work is being performed to deter future access to the roof.

**Operations Support**

*Emergency Planning*

- Staff continue to procure mobile analytical equipment and water quality sensors as authorized by a recent Department of Homeland Security Grant. A new round of grant funding was announced in May and staff submitted a grant application in June.
- A severe hurricane drill was conducted in April; the exercise involved field deployment of critical maintenance equipment and a transfer to the back-up Emergency Operations Center at the CWTP.

*Operations Engineering*

- In April and May, staff continued to implement the Operations Plan for the scheduled shutdown and internal inspection of the Norumbega Tanks cells. The series of individual cell inspections was completed in late April and all site work was completed in May. Maintenance of tank hatch intrusion detection was completed concurrently.
- In May, staff implemented Operations Plans and began start-up testing of the rehabilitated Belmont Pump Station. Staff expect performance testing to extend into July. Hyde Park and Brattle Court Phase 1 work will require similar start-up work in the fall.

*SCADA*

- Staff have been participating in the ongoing construction of SCADA improvements to wastewater pumping stations and CSOs as part of the first Wastewater SCADA construction contract. Through the 4th Quarter, controls have been successfully upgraded at all Contract 1 field sites (pump stations and CSOs) to the point that site functions are now controllable from the OCC. Closeout and addressing of punch list items is nearing completion.
- The second construction contract (SCADA improvements at Headworks) began in February. Staff coordinated field activities as work began in April in Chelsea and Ward Street Headworks, and will continue into the fall.

*Wastewater Metering*

- During the spring, new flow testing information identified further calendar 2007 flow edits necessary at some field sites. These minor 2007 flow edits were made concurrent with CEB adoption in June. These included a number of site-specific issues that resulted from spring field work and represented an accumulation of corrections found after publication of the CEB.
- Staff continued to work aggressively on reducing the erratic velocity issues at some meter sites. A temporary flow testing contractor provided further flow tests at some problem sites through the 3rd and 4th Quarters as a check of installed meter flows. A new contract for temporary flow testing is being prepared for June to provide further flow tests at some problem sites and to review selected un-metered drainage area contributions as part of quality assurance on the flow methodology.

*Water Quality Assurance*

- In April, staff participated in overseeing the scheduled diver entry to Norumbega Tanks for water quality monitoring purposes. Staff monitored the sanitary aspects of the operation and provided extra water quality sampling with no issues found.

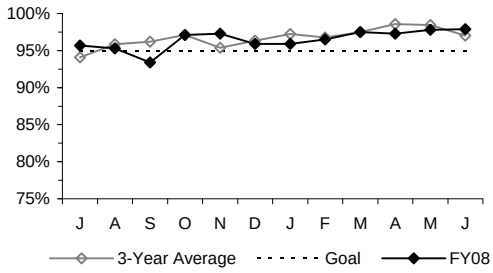
- In May, staff continued seasonal preparations for warm-weather operation including planning of summer CWTP monitoring activities and assessment of measures taken as part of the expert panel recommendations. Relocation of the chlorine feed point occurred in June and staff continue to monitor the effects.

- In June, staff began installation of S::CAN Spectrolysers at the CWTP as a pilot test of a new on-line organics monitoring technology.

# Laboratory Services

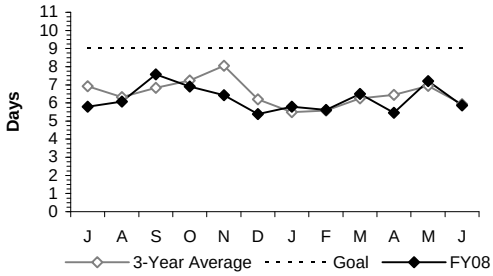
4th Quarter - FY08

**Percent On-Time Results**



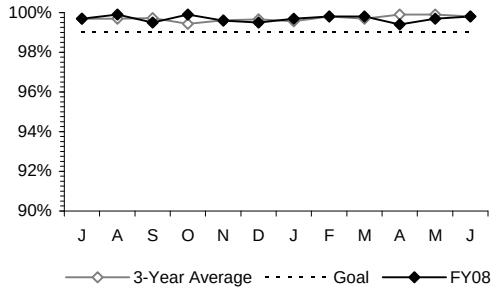

The Lab's Percent On-Time measurement was above the 95% goal for each month during the 4th Quarter.

**Turnaround Time**



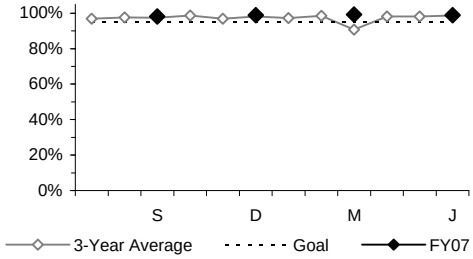

During the 4th Quarter, Turnaround Time was faster than the 9-day goal for each month.

**Percent Valid Tests**



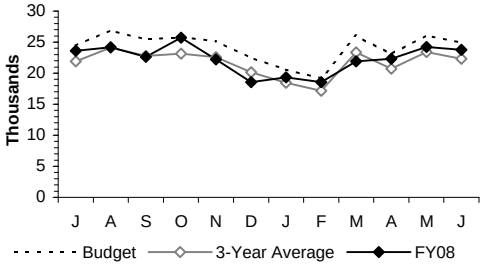

The Lab's Percent Valid Tests measurement stayed above the 99% goal for each month during the quarter.

**Quarterly Compliance Rating**



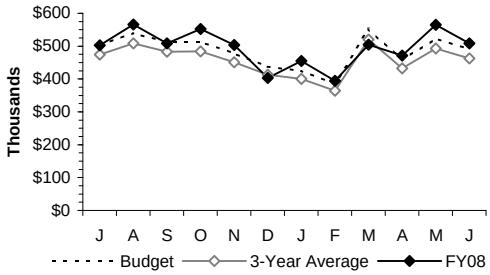

A quarterly compliance audit for DEP certification audit readiness found good compliance with standards.

**Tests Completed**




The Tests Completed measurement was slightly below the seasonally-adjusted budget goal for each month of the quarter.

**Value of Services Rendered**




Value of Services Rendered was above the seasonally-adjusted budget projection for each month of the quarter.

**Highlights:** DLS's contract lab found no detectable amounts of 31 pharmaceuticals, hormones, or estrogen-disrupting chemicals in MWRA's finished drinking water. The Acid Rain Monitoring Program expressed appreciation to The Quabbin Lab for another successful year of voluntary analysis. Laura Ducott and ENQUAD presented a poster paper at the American Society for Microbiology meeting.

**LIMS:** Lab staff continue to work on configuring the lab analyses part of new LIMS. Implementation of the new LIMS is expected to take place by the end of 2008. Staff met with DEP regarding submitting drinking water results electronically using the new LIMS.

**Security:** Discussed inter-agency coordination issues as part of the expert panel discussion at a regional homeland security summit hosted by EPA NE Region. Participated in agency-wide hurricane preparedness drill and MWRA Emergency Services Unit sampling drill at the Fells Tank. Coordinated installation of instruments intended for contamination response.

**Quality Assurance:** A two-day routine certification audit at the Central Lab by DEP found only minor items for correction before the audit report is finalized. Submitted applications to become certified for other testing categories that DEP has recently added to its program.

**Clinton:** Tested a large number of samples to investigate possible waste that might affect plant performance.

**DITP:** Performed rush testing of "pink" influent from the North system.

**ENQUAD:** Relocated DLS's two sampling boats to Winthrop's new town marina. Tested additional samples from Boston Harbor and Massachusetts Bay in response to the Red Tide outbreak.

**FOD/TRAC:** Assisted MIS and TRAC with testing the data transfer interface between the current LIMS and PIMS. Performed rush testing of samples collected at an area where water was surfacing near the Squantum Force Main and a local drinking water line.

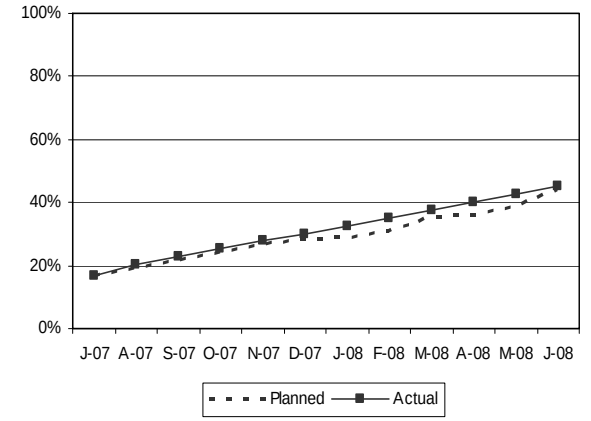
**FOD/Water Quality Assurance:** Tested a number of CWTP "profiling" samples for bacteria and nutrients to assist process control. This work will continue through the summer. Submitted final data for the March Lead and Copper Rule sampling. Tested customer complaint samples from Medford, Newton, Somerville and Waltham. Tested tank inspection samples.

**Outside Customers:** Began Initial Distribution System Evaluation testing of disinfection by-product samples for Chicopee, South Hadley and Wilbraham. Provided the Charles River Swim Club with two days of testing for its annual swim on 6/14. Started annual beach testing for DCR, Revere, and Winthrop.

# CONSTRUCTION PROGRAMS

# Projects In Construction - 1
# June 2008
**(Progress Percentages based on Construction Expenditures)**

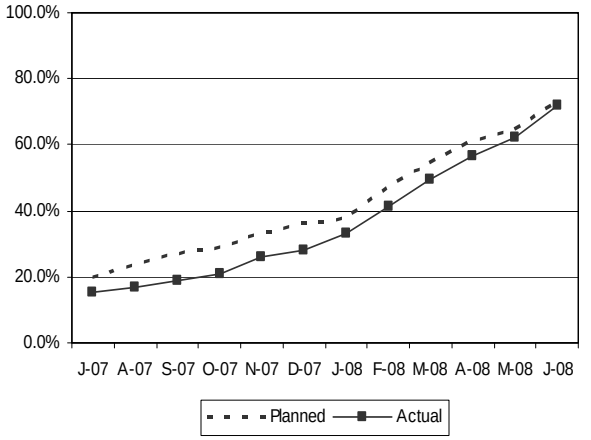
**Blue Hills Covered Storage Design Build Project**
**Progress - June 2008**




***Project Summary:*** This project includes of a 20 million gallon covered storage facility at the Blue Hills Reservation, providing sufficient distribution storage to the communities of MWRA's Southern High Storage Area.

***Status and Issues:*** During June, the contractor continued forming, installing rebar and placing concrete for the walls in Tank 1 & 2. In Tank 2 the contractor continued installing the interior base slab rebar and forming interior slab bulkheads. In the Phase I area of the core wall, the contractor continued placing backfill concrete and began forming and installing rebar for the core wall foundation. The contractor started excavating, cleaning bed rock and installing backfill concrete in the Phase II area of the core wall in preparation for the foundation grouting. Work continued on building the southern slope and paths for the proposed pond. Delivery and installation of plants (west of Dam) began, while the contractor continued screening material to be used for the Zone 1 fill at the dam.

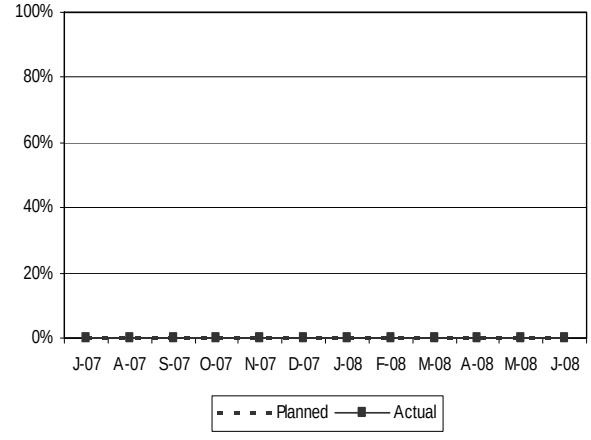
**North Dorchester Bay CSO Tunnel/Shafts**
**Progress - June 2008**




***Project Summary:*** Construction of 10,872 LF of 17-ft diameter segment lined storage tunnel with 7 diversion structure/drop shafts and associated sewer and drainage separation pipework.

***Status and Issues:*** During June, the contractor mined 1,804 lf from Sta 62+44 near I street along Day Blvd to Sta 80+48 near Columbia Park. The contractor mined at an average rate of 86 lf/day. At -083 installation of pipelines continued and reached 50% completion in the area between I-K Street. At -085 the contractor continued Hydraulic Control Vault fitout and installing interconnecting hydraulic, power, communication and control utilities. At -086 the contractor completed installation of drainage upgrades between Moakley Park and Gavin Way. Work also continued on the Hydraulic Control Vault fitout and installing interconnecting hydraulic, power, communication and control utilities. At -087 work was completed on the NStar electric duct bank that will provide power to the work area.

**East Boston Branch Relief Sewer**
**Progress - June 2008**

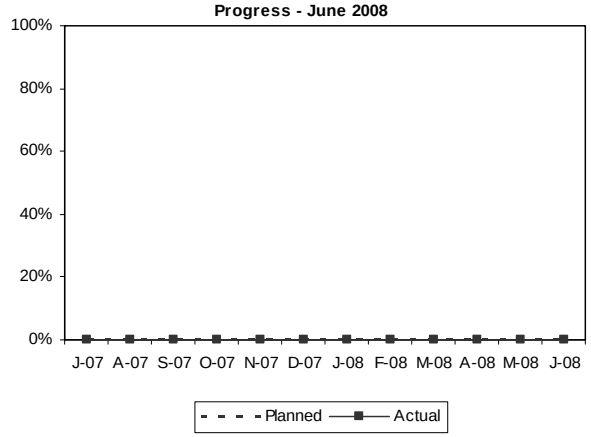



***Project Summary:*** Construction of 14,500 feet of replacement sewers primarily by microtunneling.

***Status and Issues:*** The construction bid was advertised on May 10 and the bid opening was extended to July 9th, with an anticipated award at the July 16th board meeting. This is a court ordered project and with notice to proceed schedule of June 30. Construction duration will be for 24 months and the latest engineering estimate is $55.1 million.

# Projects In Construction - 2
# June 2008
**(Progress Percentages based on Construction Expenditures)**

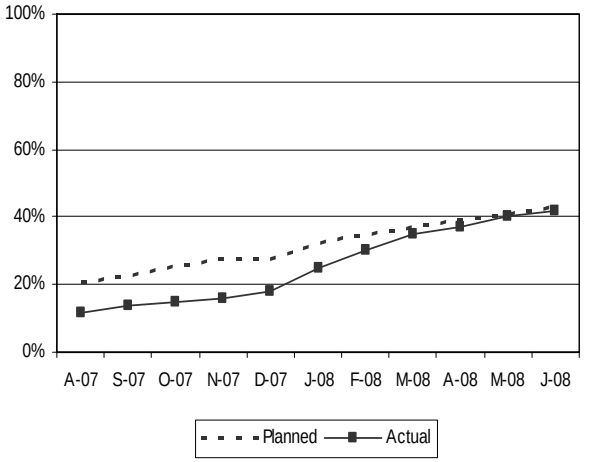
**Cottage Farm/Brookline Connection and Inflow Controls**
**Progress - June 2008**




***Project Summary:*** Construction will activate the existing 45" Brookline Connection, modify and build an interconnection between two existing overflow chambers, replace sluice gates, and provide remote monitoring of flows to optimize the operation of the Cottage Farm CSO.

***Status and Issues:*** The contract was awarded at the June 4th board meeting to D&C Construction in the amount of $1,976,000. The award letter was sent on June 9th, the preconstruction meeting was held on June 26th and the Notice To Proceed was issued with an effective date of June 30th, in accordance with the court ordered schedule.

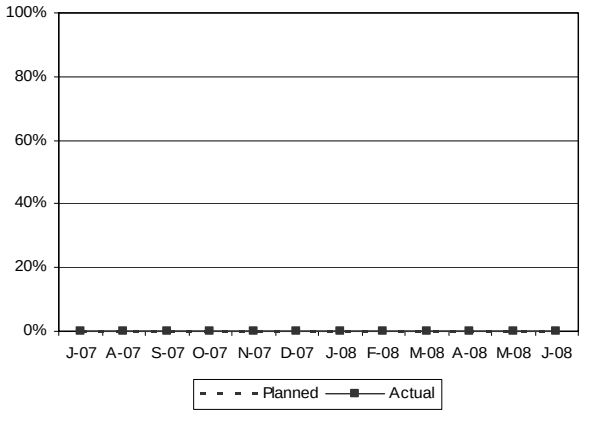
**Rehabilitation of Water Pumping Stations**
**Progress - June 2008**




***Project Summary:*** This work provides rehabilitation of a series of water pump stations. At the present time, Brattle Court and Hyde Park are the focus of work.

***Status and Issues:*** At Brattle Court, the contractor continued conduit installation within the operating floor and generator room. Work was completed on the primary and secondary power duct bank. Pressure testing was completed on both the interior and exterior of Section 28. Delivery was received and installation completed on the new PLC panel. In the generator room, installation began on framing acoustical panels. The air release vault was set on Brattle Street and the roadway was repaved. At Hyde Park, the contractor continued installation of the primary power duct bank and new floor drains and piping. The generator was placed on the concrete pad and light fixtures were replaced in the generator room. At Belmont the contractor completed masonry re-pointing work, erection of new block wall in the basement, and framing and for the bathroom walls. The 30-day startup check and testing was completed. The coupling on Pump 22 was replaced, work began on preparation for paving the driveway and roadway, all windows were replaced and work began on installation of acoustical panels.

**Hultman Aqueduct Interconnections Project**
**Progress - June 2008**




***Project Summary:*** This project includes rehabilitation construction to the Hultman Aqueduct to provide redundancy to the MetroWest Tunnel from Southborough to Weston by adding five new MetroWest/Hultman interconnections, two surge relief structures, 13.5 miles of internal rehabilitation and 15 miles of external access work.

***Status and Issues:*** Construction specifications were submitted to Procurement and comments received on June 17th. Program manager is addressing questions for resubmission. The current schedule calls for a notice to proceed date in June. This will be a four year construction contract with a latest engineering estimate of $52.7 million.

# CSO Update
## 4th Quarter - FY08

**North Dorchester Bay Tunnel and Related Facilities**: During the fourth quarter, the contractor mined 3,536 feet of the North Dorchester Bay storage tunnel, bringing the total length of tunnel mined and lined by the end of the quarter to 8,136 feet. [As of July 21, 2008, the contractor achieved 9,598 feet (89%) of the proposed 10,832-foot tunnel.] The contractor had suspended operation of the tunnel boring machine (TBM) from April 16 to May 19 to allow the manufacturer of the pre-cast concrete liner segments to catch up with the accelerated progress of the TBM and replenish the depleted reserve of tunnel segments on-site. The shutdown also allowed the contractor to perform needed maintenance work on the TBM. The contractor resumed mining on May 19. The tunnel mining operation is expected to be completed in August 2008.

The contractor also completed construction of the emergency access shaft at Ticknor Street, approximately the midpoint of the proposed tunnel, and the emergency shaft is now operational. In addition, the contractor completed restoration work at Moakley Park in the areas of the completed CSO and stormwater diversion structures at outfalls BOS085 and BOS086, completed trench excavation and cable installation for an NStar duct bank near outfall BOS087, and completed the connection of a new storm drain to existing separate stormwater drainage at Logan Way, upstream of outfall BOS086. The new drain and connection will facilitate the separate diversion of stormwater and CSO into the tunnel at this outfall. Over the next quarter, the tunnel contractor plans to begin CSO and stormwater diversion work at outfall BOS083.

The design consultant for the tunnel related facilities (i.e. dewatering pump station, force main, and remote odor control facility) submitted the Final Geotechnical Report and the Draft CSO Outfall Sedimentation Study in April 2008 and held a technical meeting with MWRA staff to review the outfall sedimentation findings to date. The study is intended to address the long-term reliability of the existing CSO outfalls to operate in only extreme (and rare) storm events once the storage tunnel is brought on-line. The design consultant has submitted applications for MWRA to obtain construction permits. Engineering and Procurement staff are reviewing the 100% design plans and construction specifications and plan to advertise the construction contract in November 2008.

**East Boston Branch Sewer Relief:** On May 10, 2008, MWRA advertised the largest of the three construction contracts for this project, Contract 6257, which involves construction of approximately 2.5 miles of 36-, 48- and 66-inch combined sewers in East Boston. Construction will be performed primarily by microtunneling and will take place on Chelsea, East Eagle, Condor, Border, Marginal, Orleans, Gove, Bremen and Porter Streets. Contract 6257 is the second contract of the East Boston Branch Sewer Relief project to enter construction. Contract 6840, which involved rehabilitation of approximately 6,000 feet of existing East Boston Branch Sewer, was completed in 2005. Contract 6841, which is scheduled to be advertised and bid later this year and constructed in 2009, will replace approximately 5,000 feet of existing East Boston Branch Sewer by pipebursting. Together, these three contracts comprise the East Boston Branch Sewer Relief project recommended in the 1997 Final CSO Facilities Plan/EIR. Implementation of the project will significantly reduce the frequency and volume of combined sewer overflows from Outfalls BOS003-014 in East Boston by replacing the 113-year-old East Boston Branch Sewer with either larger replacement or rehabilitated pipelines.

Due to requests from contractors and specialty subcontractors, MWRA extended the bid opening date for Contract 6257 and received bids on July 9, 2008. The Board of Directors awarded the contract to Barletta Heavy Division, Inc. for the low bid amount of $59,900,000, (about $4 million less than the Engineer's Estimate) and contract term of 2 years. Staff expect to issue the Notice to Proceed with the contract by the end of July 2008, one month later than the respective milestone in Schedule Seven.

Staff have completed review of the 50% design plans and construction specifications for Contract 6841, the last of three construction contracts to complete the project. Staff expect to receive the 100% plans and specifications in August 2008 and issue the notice to proceed with construction by December 2008.

**Brookline Connection and Cottage Farm Overflow Chamber Interconnection and Gate Controls:** On June 4, 2008, MWRA's Board of Directors awarded the construction contract for this project to D&C Construction Company, Inc. for the low bid amount of $1,976,000 (about $484,000 less than the Engineer's Estimate) and contract term of 1,217 days. The Notice to Proceed was issued on June 30, 2008, in compliance with Schedule Seven. MWRA has obtained all necessary construction permits and land access agreements other than those which are the contractor's responsibility pursuant to the terms of the construction contract. This project is intended to reduce treated CSO discharges from the Cottage Farm CSO Facility to the Charles River Basin by increasing the conveyance of related wet weather flows to MWRA's Ward Street Headworks and Deer Island Wastewater Treatment Plant. The project involves

modifications to existing MWRA facilities on both the Cambridge side and the Boston/Brookline side of the Charles River. These modifications will improve the conveyance capacities of the two MWRA sewers already in service that carry flows across the Charles River and bring into service a previously unutilized 54-inch diameter sewer (the "Brookline Connection") constructed nearly 40 years ago by MWRA's predecessor, the Metropolitan District Commission.

**Charles River Interceptor Gate Controls and Additional Interceptor Connections:**
In January 2008, MWRA issued the notice to proceed with the contract for hydraulic study and design services to optimize the hydraulic performance of the MWRA interceptor sewers along the Charles River Basin and minimize overflows to the Cottage Farm facility and other CSO outfalls. Since then, MWRA's engineering consultant has made considerable progress with the hydraulic model evaluations that will support design of the gate controls at existing interconnections between the Charles River Valley Sewer and the South Charles Relief Sewer in Brighton/Brookline and possible modifications to the existing connections between the North Charles Metropolitan Sewer and the North Charles Relief Sewer in Cambridge. The hydraulic study is also intended to support the recommendation for additional interceptor connections, which is due by January 2009 in compliance with Schedule Seven. The consultant submitted the Final Hydraulic Modeling Work Plan in March 2008 and the Final Geotechnical/Hazardous Materials Program Work Plan in June 2008. The consultant also submitted the Hydraulic Modeling Technical Memorandum in May 2008 for MWRA review and held a related technical workshop with MWRA engineers and sewer system operators on June 4, primarily to review the baseline condition model results and the preliminary alternatives identified for further evaluation.

**Optimization Study of Prison Point CSO Facility:** In April 2008, MWRA submitted a report to EPA and DEP on the results of its one-year start-up, testing and verification program to implement new operational control strategies at the Prison Point Facility intended to minimize treated discharges to the Inner Harbor. In the report, MWRA proposed a revised long-term level of CSO control for the facility that reduces average annual discharges from 30 activations and 335 million gallons to 17 activations and 243 million gallons. Soon after submitting the report, MWRA filed a motion with the Federal Court to incorporate the revised level of control into the Court Order.

**Morrissey Boulevard Storm Drain:** A component of the North Dorchester Bay CSO control plan, the Morrissey Boulevard storm drain project is intended to direct some of the North Dorchester Bay stormwater away from MWRA's recommended CSO storage tunnel in storms greater than the 1-year design storm. Construction of the Morrissey Boulevard Storm Drain commenced in December 2006, and BWSC's initial construction contract, to install a large diversion structure on outfall BOS087, is complete. BWSC issued the notice to proceed with the second, much larger construction contract in September 2007. Construction activities conducted during the past quarter included the installation of open trench support, the driving of piles to support the 12 ft. by 12 ft. box culvert (i.e. the storm drain) and the installation of the pre-cast culvert sections from the University of Massachusetts (UMass) access road to a point just north of the Boston College High school service road. Work will progress north of this section towards Kosciusko Circle, and eventually the new outfall will be constructed from the UMass access road south to its outlet at Savin Hill Cove. The contract completion date is June 30, 2009, in compliance with Schedule Seven.

**Reserved Channel Sewer Separation:** This project is intended to minimize CSO discharges to the Reserved Channel by separating combined sewer systems in adjacent areas of South Boston. Implementation of the recommended sewer separation plan will reduce the number of overflows to Reserved Channel from as many as 37 to 3 in a typical year. BWSC has submitted the preliminary design report to MWRA and has commenced final design work. The project cost estimate to lay the new storm drains through the congested residential and commercial streets and tight utility corridors that characterize the Reserved Channel area has greatly increased. BWSC's updated cost estimate for design and construction (reflected in MWRA's Approved FY09 CIP) is $113.8 million, a significant increase over the $59.3 million that was included in MWRA's FY08 CIP for this project. MWRA is reviewing the design plans and detailed cost estimate, as well as alternative methods to meet CSO control goals, to determine how to proceed with this project. In the meantime, BWSC's design work remains on schedule for commencement of construction by May 2009 in compliance with Schedule Seven.

**Bulfinch Triangle Sewer Separation:** The goal of the Bulfinch Triangle sewer separation is to minimize CSO discharges to the Charles River by separating combined sewer systems in the area of Boston roughly bounded by North Station, Haymarket Station, North Washington St., Cambridge St. and immediate environs. The recommended sewer separation plan is intended to reduce the number of overflows to the Charles River, reduce overflows to the Prison Point CSO facility, and close outfall BOS049. BWSC completed final design and advertised the construction contract on May 14, 2008. BWSC received construction bids on June 26, 2008 and awarded the contract to P. Gioioso and Son in the amount of $10.8 million. BWSC expects to commence construction soon, ahead of the November 2008 milestone in Schedule Seven. The cost of the project (design and construction) has greatly increased. The total budget

for design and construction in MWRA's Approved FY09 CIP is $10.2 million, a significant increase over the $4.4 million that was included in MWRA's FY08 CIP for this project.

**Brookline Sewer Separation:** This project will separate sewers in several areas of Brookline, totaling 72 acres, where there are remaining combined sewers tributary to MWRA's Charles River Valley Sewer. The project is intended to reduce discharges to the Charles River at the Cottage Farm facility. The Town of Brookline is making scheduled progress with final design and plans to advertise the construction contract in August 2008. Design activities conducted in the fourth quarter FY08 include final drainage calculations and pipe sizing; preparation of plan and profile sheets, structural details of special structures, and specifications for microtunneling. In addition, Brookline is evaluating options to the proposed microtunneling of deep service connections. The cost of the project (design and construction) has greatly increased. The total budget for design and construction in MWRA's Approved FY09 CIP is $23.5 million, a significant increase over the $9.1 million that was included in MWRA's FY08 CIP for this project.

**Cambridge/Alewife Brook Sewer Separation:** Staff estimate that the five projects constituting the long-term CSO control plan for Alewife Brook, including CAM004 stormwater outfall and detention basin (Cambridge Contract 12), CAM400 manhole separation; interceptor connection relief and floatables control at CAM002, CAM401B, SOM01A and CAM001, CAM004 sewer separation, and MWR003 control gate/floatables control and MWRA Rindge Avenue siphon relief have to date experienced a delay of at least 27 months beyond the Schedule Seven milestones due to the wetlands appeals associated with Contract 12. In addition, a notice of intent to file a Clean Water Act citizen suit was filed with EPA relevant to the issuance of the September 2007 variance extension for the Alewife Brook/Upper Mystic River.

Despite these appeals, MWRA and Cambridge DPW have completed agreement on updated cost estimates, cash flows, cost sharing and revised project schedules, and plan to move forward with design and construction of the remaining projects by October 2008. On July 16, 2008, MWRA's Board of Directors approved Amendment 8 to the Cambridge CSO MOU and Financial Assistance Agreement, authorizing full funding of MWRA's share of the cost of the Alewife projects, at $60,021,000, with a time extension to complete the work by December 2015. The amendment awaits formal approval by the City Manager.

A portion of the Cambridge/Alewife sewer separation project is being implemented by MWRA. The work involves installation of an overflow control gate and floatables control at outfall MWR003 and hydraulic relief of an MWRA siphon near Rindge Avenue. Due to delays associated with Cambridge's Contract 12, MWRA has revised its schedule for the MWR003 improvements and Rindge Avenue Siphon. MWRA now plans to commence design by July 2011.

**Other CSO Control Work:**

BWSC continues to perform minor work and system performance assessments in the areas of the completed South Dorchester Bay, Stony Brook and Fort Point Channel sewer separation projects.

In June 2008, MWRA's Board of Directors approved a transfer of $2,030,000 in previously authorized (and no longer needed) funds for the South Dorchester Bay sewer separation project to fund BWSC work to bring CSO discharges to the Dorchester Brook Conduit in-line with approved long-term levels of control. This work involves relocation of a BWSC CSO regulator and limited sewer separation work in the South Bay area.

# CIP Expenditures
June 2008

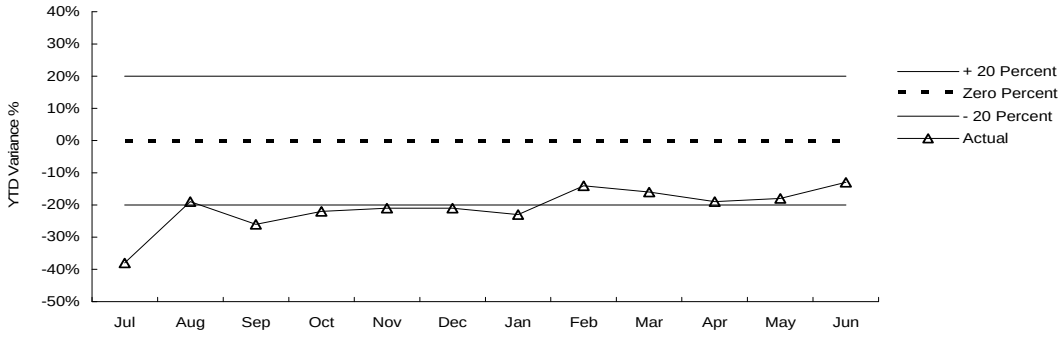
Accurate projections of CIP spending are one measure of effective project management and are important to ensuring that funds are available to support MWRA's capital program.

| FY08 Capital Improvement Program<br>Expenditure Variances through June by Program<br>($000) | | | | |
|---|---|---|---|---|
| Program | FY08 Budget Through June | FY08 Actual Through June | Variance Amount | Variance Percent |
| Wastewater | 141,646 | 146,619 | 4,973 | 3% |
| Waterworks | 77,001 | 45,952 | (31,049) | -40% |
| Business and Operations Support | 8,695 | 4,190 | (4,505) | -51% |
| Total | $227,343 | $196,762 | ($30,581) | -13% |

Underspending within Waterworks is primarily attributable to the timing of community loan disbursements in the Local Water Pipeline Improvement Loan Program and the delay in watershed land purchases by DCR, as well as revised schedules for New Connecting Mains-Shaft 7 to WASM 3 contracts including Northeast Segment (CP5) and South Segment (CP3).

## CIP Expenditure Variance

*Total FY08 CIP Budget of $227,943,000.*




## Construction Fund Management

All payments to support the capital program are made from the Construction Fund. Sources of fund revenues 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 6/30/08 | $104 million |
| Unused capacity under the debt cap: | $441 million |
| Estimated date for exhausting construction fund without new borrowing: | Oct-08 |
| Estimated date for debt cap increase to support new borrowing: | FY2009 |
| Commercial paper outstanding:<br>Commercial paper capacity: | $191 million<br>$350 million |
| Budgeted FY08 capital spending*: | $206 million |
| Projected FY08 grant and SRF receipt: | $83 million |

* Cash based spending is discounted for construction retainage.

# DRINKING WATER QUALITY AND SUPPLY

# Source Water – Microbial Results

4th Quarter - FY08

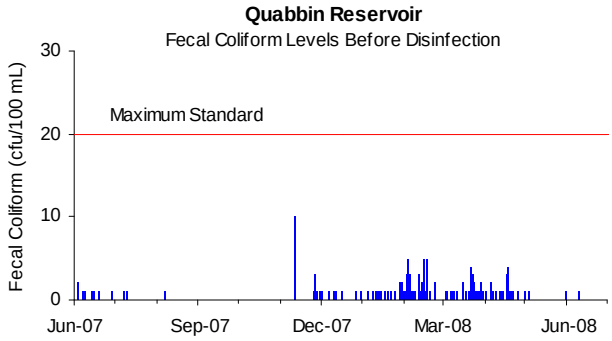
## Background

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 requires that no more than 10% of source water samples prior to disinfection over any six-month period have more than 20 fecal coliforms per 100ml.

**Sample Site: Quabbin Reservoir**

Quabbin Reservoir water is sampled at the Ware Disinfection Facility (WDF) raw water tap before entering the CVA system.

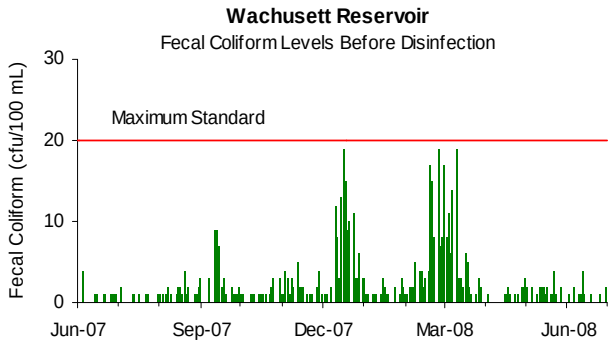
All samples collected during the 4th Quarter were below 20 cfu/100ml. For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100ml.

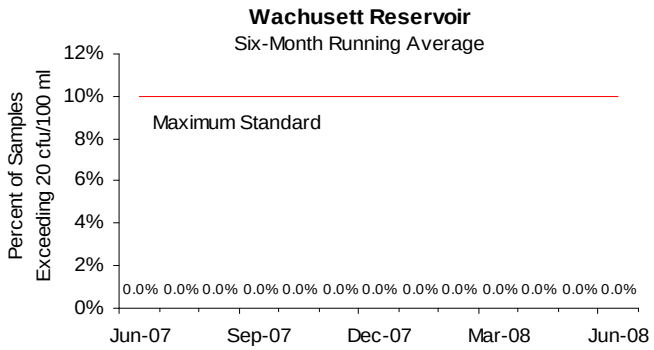



**Sample Site: Wachusett Reservoir**

Wachusett Reservoir water is sampled before it enters the MetroWest/Metropolitan Boston systems at the CWTP raw water tap in Marlborough.

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.



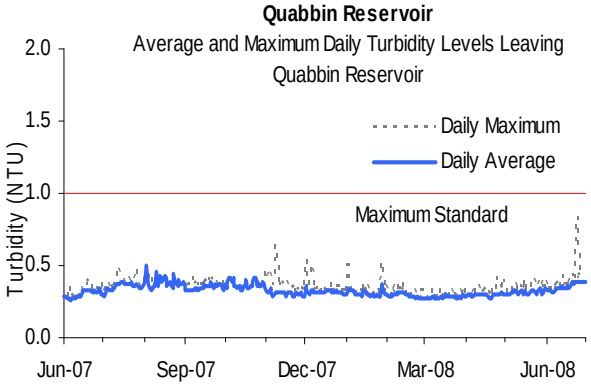
# Source Water – Turbidity

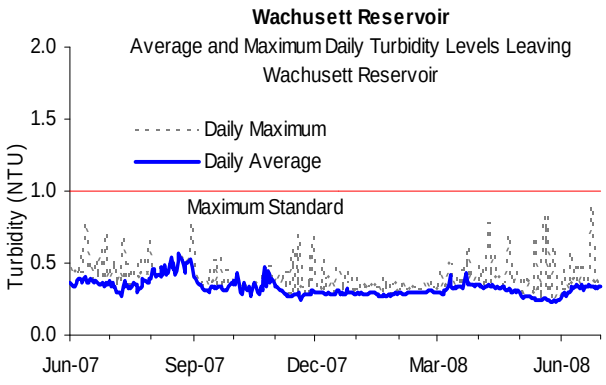
4th Quarter - FY08

### Background

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 chlorine demand or may protect bacteria from the disinfectant effects of chlorine, thereby interfering with the disinfectant residual throughout the distribution system.

Samples for turbidity from Quabbin Reservoir are collected at the Ware Disinfection Facility before chlorination. Samples from Wachusett Reservoir are taken at the CWTP's inlet (raw water line) before treatment. The Massachusetts Department of Environmental Protection standard for source water turbidity for unfiltered water supply systems is a maximum of 1.0 NTU; the EPA standard is a maximum of 5.0 NTU. Maximum turbidity results at Quabbin and Wachusett were within DEP standards for the quarter.



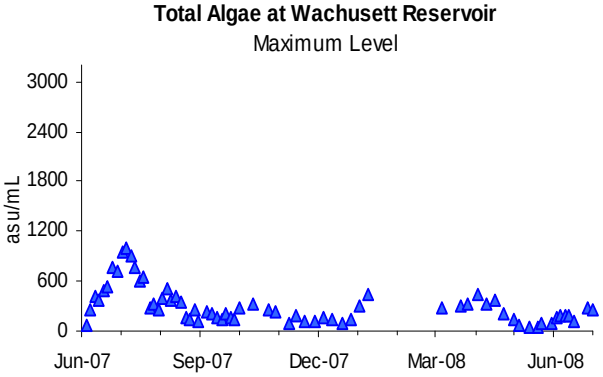



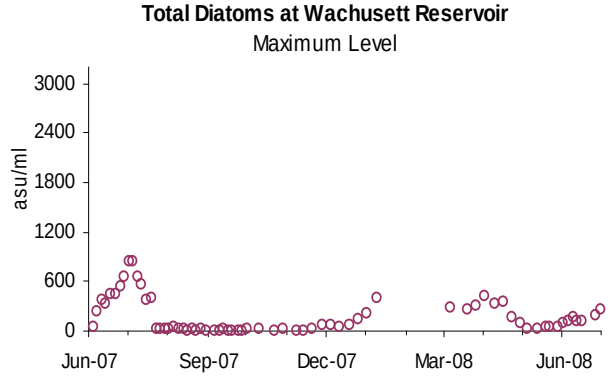

# Source Water – Algae

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

Taste and odor complaints at the tap may be due to algae, which originate in source reservoirs, typically in trace amounts. Occasionally, a particular species grows rapidly, increasing its concentration in water. When *Synura*, *Anabaena*, or other nuisance algae bloom, MWRA may treat the reservoir with copper sulfate, an algaecide. During the winter and spring, diatom numbers may increase. While not a taste and odor concern, consumers using filters may notice more frequent changing of the filters is needed. Diatom levels were low during the quarter.

Algal levels were low for the quarter.



# Treated Water – Disinfection Effectiveness

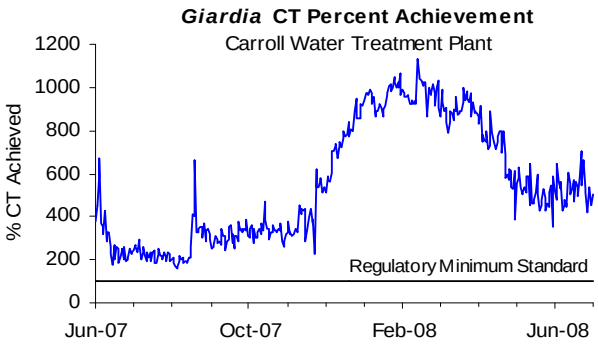
4th Quarter - FY08

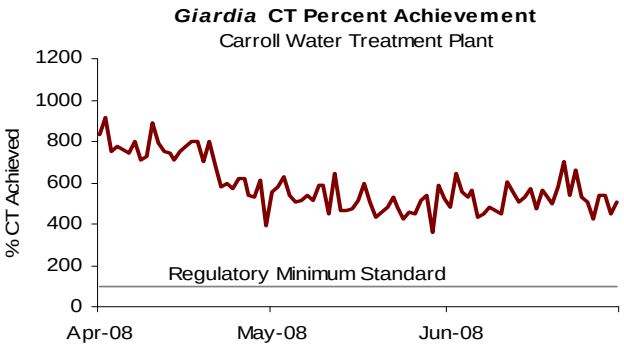
## Background

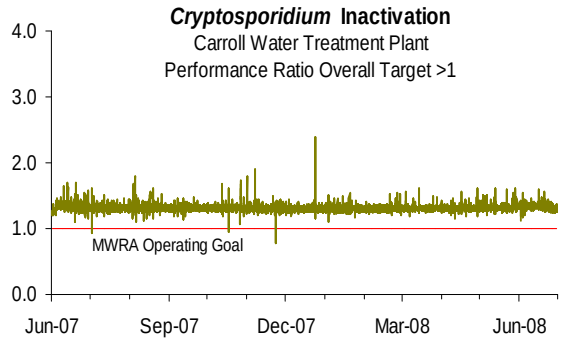
With the activation of the Carroll Water Treatment Plant (CWTP), MWRA now reports on both regulatory required 99.9% inactivation for *Giardia*, and its voluntary operating goal of 99% inactivation for *Cryptosporidium*. MWRA calculates hourly CT inactivation rates and reports daily CT inactivation rates at maximum flow, as specified by EPA regulations. The concentration (C) of the disinfectant over time (T) yields a measure of the effectiveness of disinfection. CT achievement for Giardia assures CT achievement for viruses, which have a lower CT requirement. The required CT for ozonated water varies with water temperature.

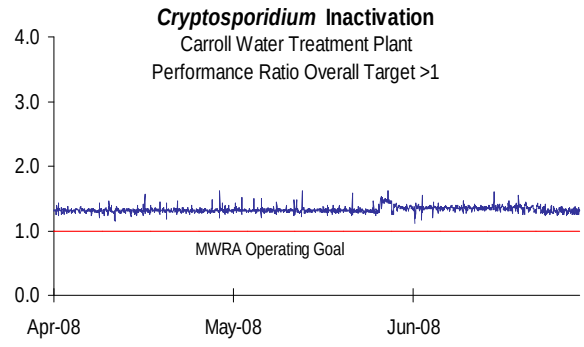
**Wachusett Reservoir – MetroWest/Metro Boston Supply:**

To avoid confusion with the regulatory requirements, inactivation of *Cryptosporidium* is reported as Performance Ratio (PR). A PR of 1 demonstrates inactivation of 99% of *Cryptosporidium* based on site-specific data. PR was maintained above 1 at all times the plant was providing water into the distribution system. CT calculation for *Giardia* is conservative; subsequently more inactivation occurs than is being reported. Compliance with the *Giardia* standard is expressed as percent of required CT achieved; 100% is the minimum allowed. *Giardia* CT was met each day this quarter. Ozone dose at the CWTP varied between 2.4 to 3.0 mg/L for the quarter.



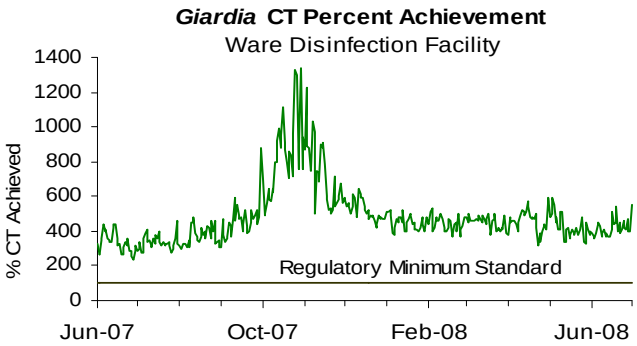



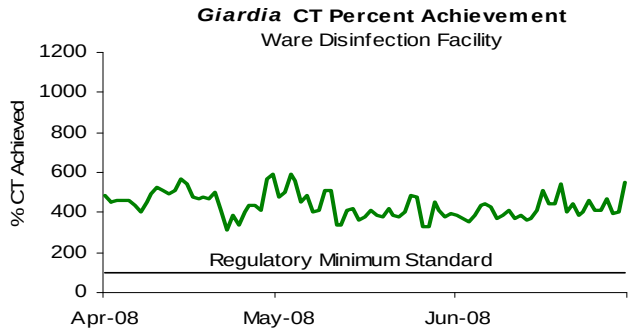




## Quabbin Reservoir at Ware Disinfection Facility (CVA Supply):

Chlorine dose remained at 1.3 mg/L. CT was met each day this quarter, as well as every day for the last fiscal year.



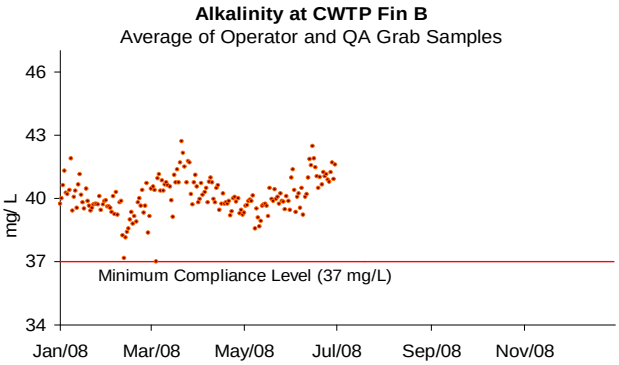



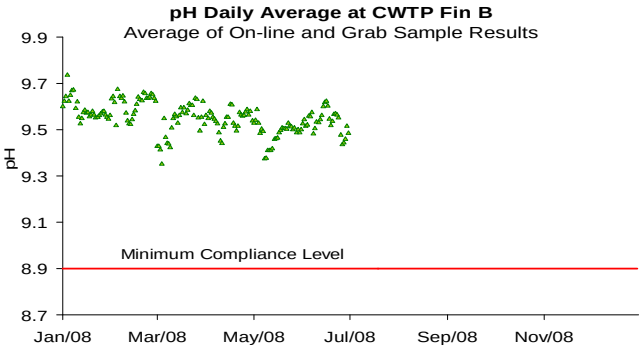
# Treated Water – pH and Alkalinity Compliance

4th Quarter - FY08

MWRA adjusts the alkalinity and pH of Wachusett water to reduce its corrosivity, which minimizes the leaching of lead and copper from service lines and home plumbing systems into the water. MWRA's target for distribution system pH is 9.3; the target for alkalinity is 40 mg/l. Per DEP requirements, samples from the CWTP's Fin B tap have a minimum compliance level of 8.9 for pH and 37 mg/L for alkalinity. Samples from 27 distribution system taps have a minimum compliance level of 8.8 for pH and 37 mg/L for alkalinity. For no more than nine days in a six-month period may results be below these levels. Quality Assurance staff and Operators test pH and alkalinity daily at the CWTP Fin B tap. Distribution system samples are collected in March, June, September, and December.

Distribution system samples were collected on June 18, 2008; sample pH ranged from 9.2 to 9.6 and alkalinity ranged from 41 to 44 mg/L. No sample results were below DEP limits for this quarter.




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

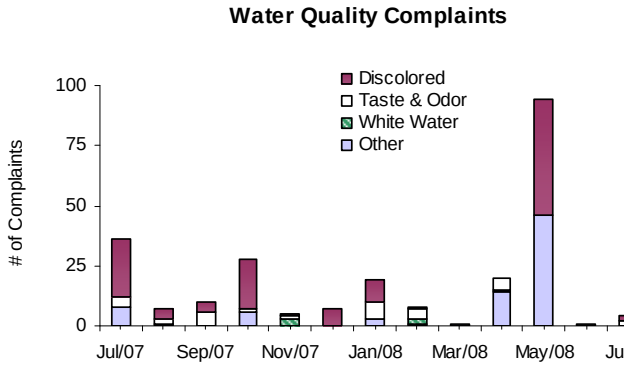
### Background

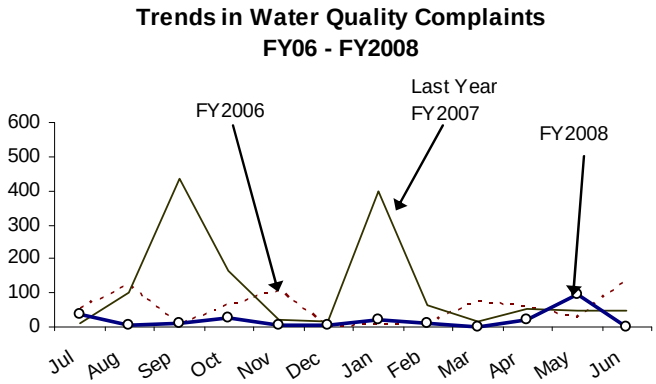
MWRA collects information on water quality complaints that typically fall into four categories: 1.) discoloration due to MWRA or local pipeline work; 2.) taste and odor due to algae blooms in reservoirs or chlorine in the water; 3.) white water caused by changes in pressure or temperature that traps air bubbles in the water; or 4.) "other" complaints including no water, clogged filters or other issues. When nuisance algae bloom, such as *Synura* or *Anabaena*, MWRA treats the reservoirs with copper sulfate, an algaecide.

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.

### Outcome

Communities reported 117 complaints during the quarter compared to 147 complaints for 4th Quarter of FY07. Of these, 49 were "discolored water" complaints; seven were "taste and odor"; one was "white water", and 60 were "other" complaints.



# Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

4th Quarter - FY08

While all communities collect bacteria samples for the Total Coliform Rule (TCR), 38 systems (including Deer Island and Westborough State Hospital) use MWRA's Laboratory for TCR compliance testing. These systems collect samples for bacteriological analysis and measure water temperature and chlorine residual at the time of collection. The other 10 MWRA customer communities (including Lynn's GE plant) have their samples tested elsewhere and these towns should be contacted directly for their monthly results.

There are 140 sampling locations for which MWRA is required to report TCR results. These locations include a subset of the community TCR locations, as well as sites along MWRA's transmission system, water storage tanks and pumping stations.

The TCR requires that no more than 5% of all samples may be total coliform positive in a month (or that no more than one sample be positive when less than 40 samples are collected each month). Public notification is required if this standard is exceeded.

*Escherichia coli* (*E.coli*) is a specific coliform species that is almost always present in fecal material and whose presence indicates likely bacterial contamination of fecal origin. If *E. coli* are detected in a drinking water sample, this is considered evidence of a critical public health concern. Additional testing is conducted immediately and joint corrective action by DEP, MWRA, and the community is undertaken. Public notification is required if follow-up tests confirm the presence of *E. coli* or total coliform. MWRA considers a disinfectant residual of 0.2 mg/L a minimum target level at all points in the distribution system.

**Highlights**

In the 4th Quarter, two of the 5,545 community samples (0.04% system-wide) submitted to MWRA labs for analysis tested positive for coliform (Waltham (May) and Framingham (June). Of MWRA's 2,184 samples, one (0.05%) tested positive for total coliform. In June, Framingham had one sample test positive for *E.coli*. A new sample tap was installed prior to this sampling. Repeat samples were taken and did not confirm for total coliform or *E.coli*. All 39 systems that submitted chlorine residual data maintained an average disinfectant residual of at least 0.2 mg/L. Only 1.4% of the system samples had a disinfectant residual lower than 0.2 mg/L for the quarter.

**TCR results by Community**

| Town | Samples Tested for Coliform (a) | Total Coliform # (%) Positive | E.coli % Positive | Public Notification Required? | Minimum Chlorine Residual (mg/L) | Average Chlorine Residual (mg/L) |
|---|---|---|---|---|---|---|
| ARLINGTON | 177 | 0 (0%) | 0.0% | | 0.28 | 1.55 |
| BELMONT | 104 | 0 (0%) | 0.0% | | 0.42 | 1.61 |
| BOSTON | 729 | 0 (0%) | 0.0% | | 1.12 | 1.88 |
| BROOKLINE | 221 | 0 (0%) | 0.0% | | 0.80 | 1.83 |
| CHELSEA | 140 | 0 (0%) | 0.0% | | 0.50 | 1.77 |
| DEER ISLAND | 52 | 0 (0%) | 0.0% | | 0.70 | 1.73 |
| EVERETT | 130 | 0 (0%) | 0.0% | | 0.98 | 1.09 |
| FRAMINGHAM | 220 | 1 (0.45%) | 0.5% | No | 0.46 | 1.71 |
| LEXINGTON | 117 | 0 (0%) | 0.0% | | 1.39 | 1.91 |
| LYNNFIELD | 18 | 0 (0%) | 0.0% | | 0.65 | 1.19 |
| MALDEN | 195 | 0 (0%) | 0.0% | | 1.12 | 1.26 |
| MARBLEHEAD | 72 | 0 (0%) | 0.0% | | 0.57 | 1.64 |
| MARLBOROUGH (b) | 163 | 0 (0%) | 0.0% | | 0.89 | 1.77 |
| MEDFORD | 221 | 0 (0%) | 0.0% | | 0.59 | 1.70 |
| MELROSE | 117 | 0 (0%) | 0.0% | | 0.01 | 0.95 |
| MILTON | 96 | 0 (0%) | 0.0% | | 1.04 | 1.53 |
| NAHANT | 30 | 0 (0%) | 0.0% | | 0.00 | 1.16 |
| NEEDHAM (b) | 125 | 0 (0%) | 0.0% | | 0.09 | 0.54 |
| NEWTON | 277 | 0 (0%) | 0.0% | | 1.20 | 1.92 |
| NORTHBOROUGH | 48 | 0 (0%) | 0.0% | | 0.85 | 1.62 |
| NORWOOD | 108 | 0 (0%) | 0.0% | | 0.61 | 1.53 |
| QUINCY | 299 | 0 (0%) | 0.0% | | 0.44 | 1.71 |
| READING | 130 | 0 (0%) | 0.0% | | 1.23 | 1.69 |
| REVERE | 169 | 0 (0%) | 0.0% | | 1.19 | 1.64 |
| SAUGUS | 104 | 0 (0%) | 0.0% | | 1.03 | 1.68 |
| SOMERVILLE | 264 | 0 (0%) | 0.0% | | 0.11 | 1.85 |
| SOUTH HADLEY FD1 (c) | 48 | 0 (0%) | 0.0% | | 0.03 | 0.33 |
| SOUTHBOROUGH | 30 | 0 (0%) | 0.0% | | 0.28 | 1.34 |
| STONEHAM | 91 | 0 (0%) | 0.0% | | 1.28 | 1.78 |
| SWAMPSCOTT | 54 | 0 (0%) | 0.0% | | 0.20 | 1.45 |
| WAKEFIELD (b) | 143 | 0 (0%) | 0.0% | | 0.31 | 1.35 |
| WALTHAM | 218 | 1 (0.46%) | 0.0% | No | 0.02 | 1.80 |
| WATERTOWN | 130 | 0 (0%) | 0.0% | | 0.54 | 1.56 |
| WELLESLEY (b) | 109 | 0 (0%) | 0.0% | | 0.14 | 0.82 |
| WESTBORO HOSPITAL | 16 | 0 (0%) | 0.0% | | 0.32 | 1.51 |
| WESTON | 49 | 0 (0%) | 0.0% | | 0.86 | 1.77 |
| WINCHESTER (b) | 65 | 0 (0%) | 0.0% | | 0.15 | 1.01 |
| WINTHROP | 72 | 0 (0%) | 0.0% | | 0.01 | 1.53 |
| WOBURN (b) | 194 | 0 (0%) | 0.0% | | 0.04 | 0.83 |
| Total: | 5545 | 2(0.04)% | | | | |
| MASS. WATER RESOURCES AUTHORITY (d) | 2184 | 1 (0.05%) | 0.0% | No | 0.02 | 1.70 |

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

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

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

(d) MWRA sampling program includes a subset of community TCR sites as well as sites along the transmission system, tanks and pumping stations. Some MWRA TCR sites which are entry points to the community had low chlorine residuals due to various reasons.

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

4th Quarter - FY08

## Background

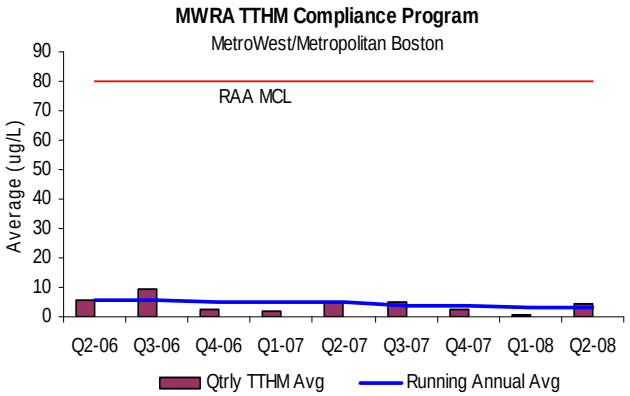
Total Trihalomethanes (TTHMs) are by-products of disinfection treatment with chlorine. Chlorination levels, the presence of organic precursors (measured by UV absorbance), pH levels, the contact time of water with chemicals used for disinfection, and temperature, all affect TTHM levels. TTHMs are of concern due to their potential adverse health effects at high levels. EPA's running annual average (RAA) standard is 80 ug/L. Haloacetic Acids (HAAs) are also regulated (RAA is 60 ug/L) (data not shown). The switch from chlorine to ozone for primary disinfection and the consolidation of treatment has lowered DBP formation and made results more uniform. DEP requires that compliance samples be collected quarterly. Partially served communities are responsible for their own compliance monitoring and reporting and must be contacted directly for their results.

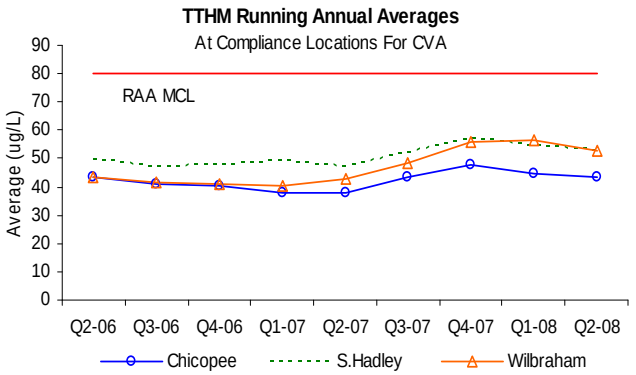
Absorbance, measured as UV-254, is a surrogate measure of reactive organic matter. Regulated DBPs have dropped to very low levels with the CWTP coming on-line. However, UV-254 levels remain useful for estimating ozone dosage and serving as a trigger for Quabbin transfer consideration.

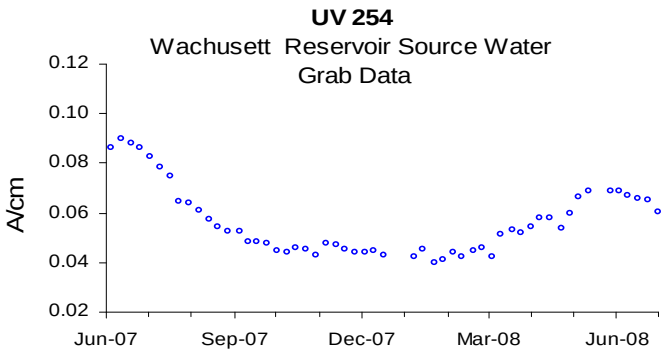
Bromate is tested monthly per DEP requirements for water systems that treat the water with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA's RAA MCL standard for bromate is 10 ug/L. The current RAA for Bromate = 0.0 ug/L.

## Outcome

The running annual average for TTHMs at compliance locations (represented as the line in the top two graphs below) remained below current standards. TTHM levels at all sampling locations for the MetroWest/Metropolitan Boston communities have declined dramatically since August 2005 following activation of the CWTP, which uses ozone rather than chlorine for primary disinfection. The RAA for TTHMs = 3.1 ug/L; HAA5s = 5.7 ug/L. CVA's DBP levels continue to be below current standards. UV-254 levels are currently around 0.06 A/cm.



# Water Supply and Source Water Management

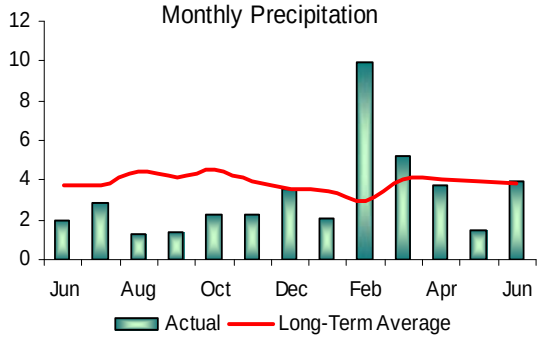
4th Quarter - FY08

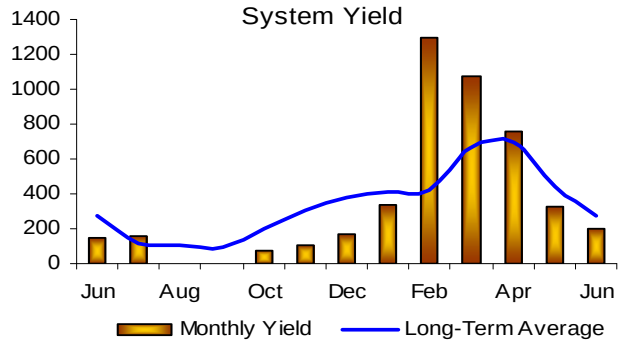
**Background**

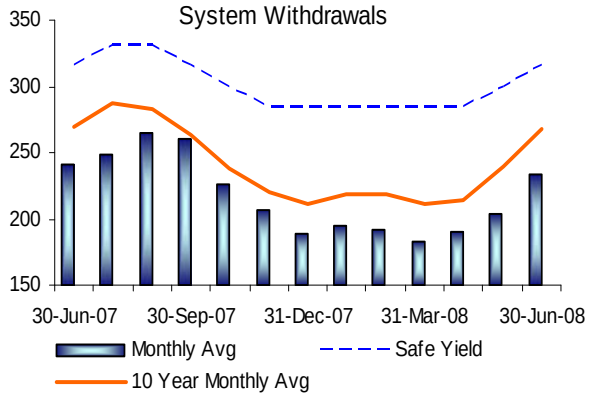
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir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

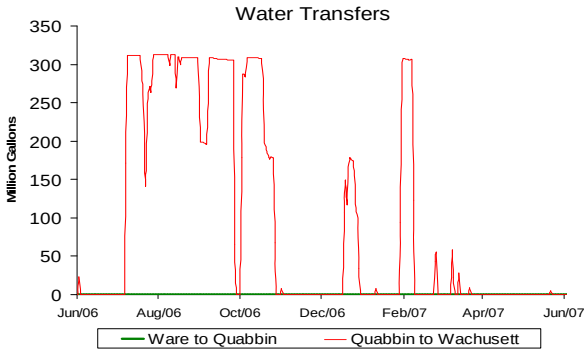
**Outcome**

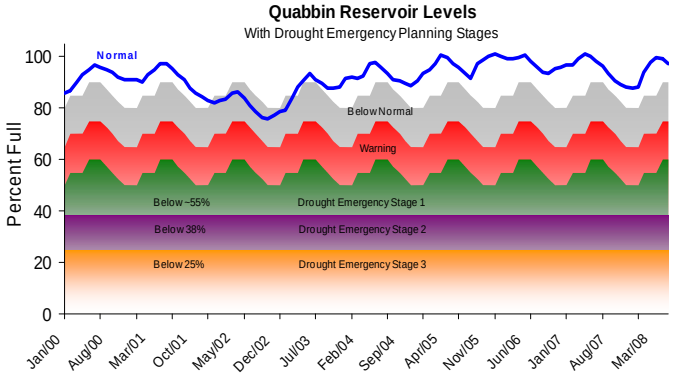
Quabbin Reservoir was at 97.4% as of June 30, 2008 which is well above normal operating range for this time of year. Quabbin spilled every day during the quarter, even though precipitation and system yields were somewhat below the long term average. A successful dry testing of the new crest gate at Wachusett Reservoir was preformed on May 28 (wet testing occurred on July 9th).



# WASTEWATER QUALITY

# NPDES Permit Compliance: Deer Island Treatment Plant

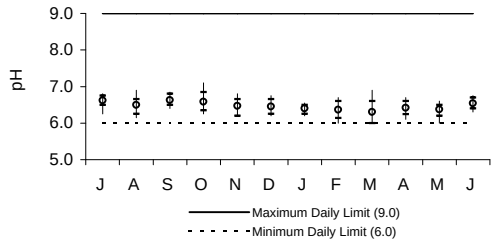
## 4th Quarter - FY08

### NPDES Permit Limits

| Effluent Characteristics | | Units | Limits | April | May | June | 4th Quarter Violations | FY08 YTD Violations |
|---|---|---|---|---|---|---|---|---|
| Dry Day Flow: | | mgd | 436 | 296.7 | 289.3 | 286.2 | 0 | 0 |
| cBOD: | Monthly Average | mg/L | 25 | 5.6 | 4.5 | 5.1 | 0 | 0 |
| | Weekly Average | mg/L | 40 | 7.7 | 5.8 | 7.1 | 0 | 0 |
| TSS: | Monthly Average | mg/L | 30 | 8.7 | 6.1 | 8.6 | 0 | 0 |
| | Weekly Average | mg/L | 45 | 13.7 | 9.7 | 11.3 | 0 | 0 |
| TCR: | Monthly Average | ug/L | 456 | 40 | 40 | 40 | 0 | 0 |
| | Daily Maximum | ug/L | 631 | 40 | 40 | 40 | 0 | 0 |
| Fecal Coliform: | Daily Geometric Mean | col/100mL | 14000 | 101.8 | 41.9 | 28.8 | 0 | 0 |
| | Weekly Geometric Mean | col/100mL | 14000 | 14.7 | 10.6 | 8.5 | 0 | 0 |
| | % of Samples >14000 | % | 10 | 0 | 0 | 0 | 0 | 0 |
| | Consecutive Samples >14000 | # | 3 | 0 | 0 | 0 | 0 | 0 |
| pH: | | SU | 6.0-9.0 | 6.1-6.7 | 6.0-6.6 | 6.3-6.8 | 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 | 50 | 50 | 100 | 0 | 0 |
| | Inland Silverside | % | 1.5 | 50 | 50 | 50 | 0 | 0 |

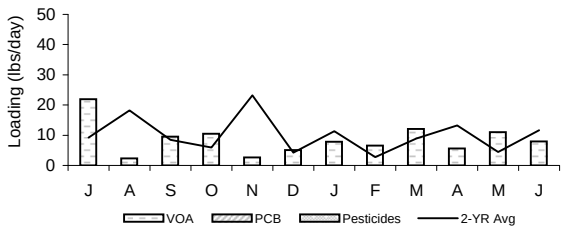
There were no permit violations at the Deer Island Treatment Plant in in Fiscal Year 2008.

**pH**



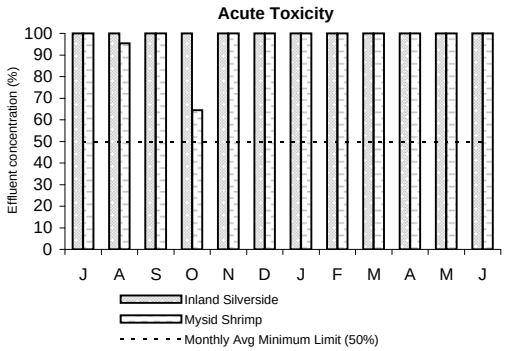

pH is a measure of the alkalinity or acidity of the effluent. Fluctuations in pH do not have an adverse effect on marine environments. Because of the pure oxygen used in the activated sludge reactor, the effluent pH tend to be at the lower range. pH measurements for the 4th Quarter were within the daily limits.

**Organic Compound Loadings**



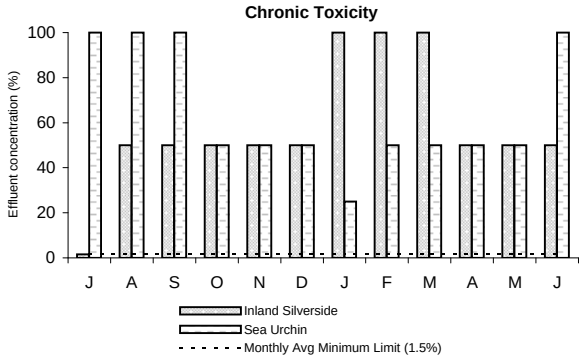

An important wastewater component to be monitored in the effluent is organic compounds, including volatile organic acids, pesticides, and polychlorinated biphenyls or PCBs. The secondary treatment process has significantly reduced organic compound loadings in the effluent stream.

**Acute Toxicity**




The acute toxicity test simulates the short-term toxic effects of chemicals in wastewater effluent on marine animals. The test measures the concentration (percent) of effluent that kills half the test organisms within four days. The higher the concentration of effluent required, the less toxic the effluent. For permit compliance, the effluent concentration that causes mortality to mysid shrimp and inland silverside must be at least 50%. Acute toxicity permit limits were met for the 4th Quarter for both the inland silverside and mysid shrimp.

**Chronic Toxicity**




Typically, effects of chronic exposures differ from those of acute exposures. Because of this, chronic toxicity responses are not necessarily related to acute toxicity. The chronic toxicity test simulates the long-term toxic effects of chemicals in wastewater effluent on marine animals. To meet the permit limit, 1.5% effluent concentration must show no observed effect on the growth and reproduction of the test species. Chronic toxicity permit limits were met for the 4th Quarter for both the inland silverside and sea urchin.

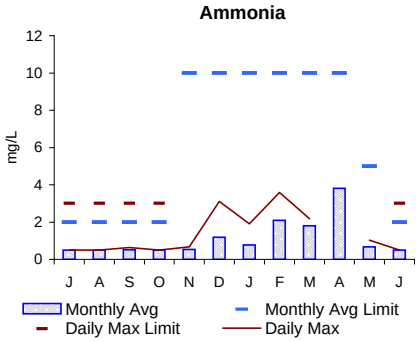
# NPDES Permit Compliance: Clinton Wastewater Treatment Plant

## 4th Quarter - FY08

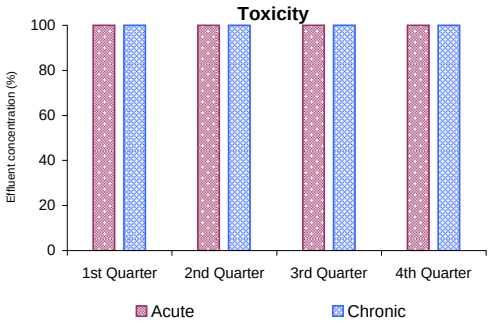
## NPDES Permit Limits

| *Effluent Characteristics* | | *Units* | *Limits* | *April* | *May* | *June* | *4th Quarter Violations* | *FY08 YTD Violations* |
|---|---|---|---|---|---|---|---|---|
| Flow: | | mgd | 3.01 | 3.08 | 2.97 | 2.93 | 1 | 7 |
| BOD: | Monthly Average: | mg/L | 20 | 4.8 | 6.8 | 3.7 | 0 | 0 |
| | Weekly Average: | mg/L | 20 | 5.7 | 9.2 | 7.1 | 0 | 0 |
| TSS: | Monthly Average: | mg/L | 20 | 3.8 | 8.6 | 4.9 | 0 | 0 |
| | Weekly Average: | mg/L | 20 | 4.0 | 16.7 | 7.8 | 0 | 0 |
| pH: | | SU | 6.5-8.3 | 6.9-7.5 | 6.2-7.6 | 7.0-7.7 | 1 | 1 |
| Dissolved Oxygen: | Daily Minimum: | mg/L | 6 | 7.6 | 6.4 | 6.5 | 0 | 0 |
| Fecal Coliform: | Daily Geometric Mean: | col/100mL | 400 | 19 | 301 | 20 | 0 | 2 |
| | Monthly Geometric Mean: | col/100mL | 200 | 2 | 6 | 3 | 0 | 0 |
| TCR: | Monthly Average: | ug/L | 50 | 0 | 0 | 0 | 0 | 0 |
| | Daily Maximum: | ug/L | 50 | 0 | 0 | 0 | 0 | 0 |
| Total Ammonia Nitrogen: | 6/1-10/31 | | | | | | | |
| | Monthly Average: | mg/L | 10.0 | 3.8 | 0.7 | 0.5 | 0 | 0 |
| | Daily Maximum: | mg/L | 35.2 | 4.6 | 1.0 | 0.5 | 0 | 0 |
| Copper: | Monthly Average: | ug/L | 20 | 6.0 | 4.2 | 6.1 | 0 | 0 |
| Phosphorus: | May 1 - Oct 31 | | | | | | | |
| | Monthly Average: | mg/L | 1.0 | 0.19 | 0.60 | 0.28 | 0 | 0 |
| Acute Toxicity: | Daily Minimum: | % | 100 | N/A | N/A | >100 | 0 | 0 |
| Chronic Toxicity: | Daily Minimum: | % | 62.5 | N/A | N/A | 100 | 0 | 0 |

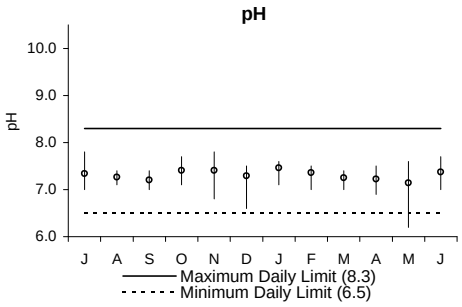
There were two permit violations at the Clinton Wastewater Treatment Plant during the 4th Quarter. April's monthly average flow of 3.08 mgd exceeded the 3.01 mgd permit limit and on May 14, the daily minimum pH result of 6.2 s.u. was below the minimum permit limit of 6.5 s.u. The low pH level may have been attributable to the increased feed of alum needed to maintain phosphorus removal. A sample taken one half hour later showed that the pH had returned to normal levels.



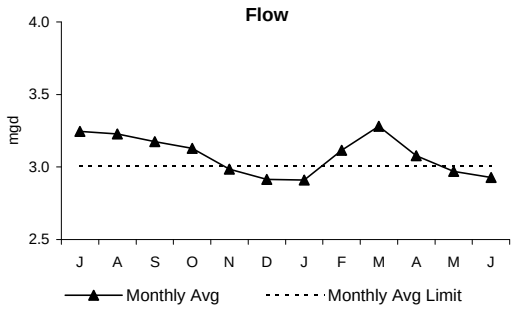

The 4th Quarter's monthly average and daily maximum concentrations were below the permit limits. The monthly average and daily maximum limits for the period of November 1 - March 31 are 10 mg/L and 35.2 mg/L, respectively. The permit limits are most stringent from June-October, when warm weather conditions are most conducive to potential eutrophication.




Acute and chronic toxicity testing simulates the short- and long-term toxic effects of chemicals in wastewater effluent on aquatic animals. For permit compliance, the effluent concentration that causes mortality to the daphnid in acute and chronic testing must be at least >100% and 100%, respectively. Permit limits were met during the 4th Quarter.




pH is a measure of the alkalinity or acidity of the effluent. The daily minimum permit limit was not met on May 14 (6.2 s.u.). All other daily pH results for the 4th Quarter were within permit limits.



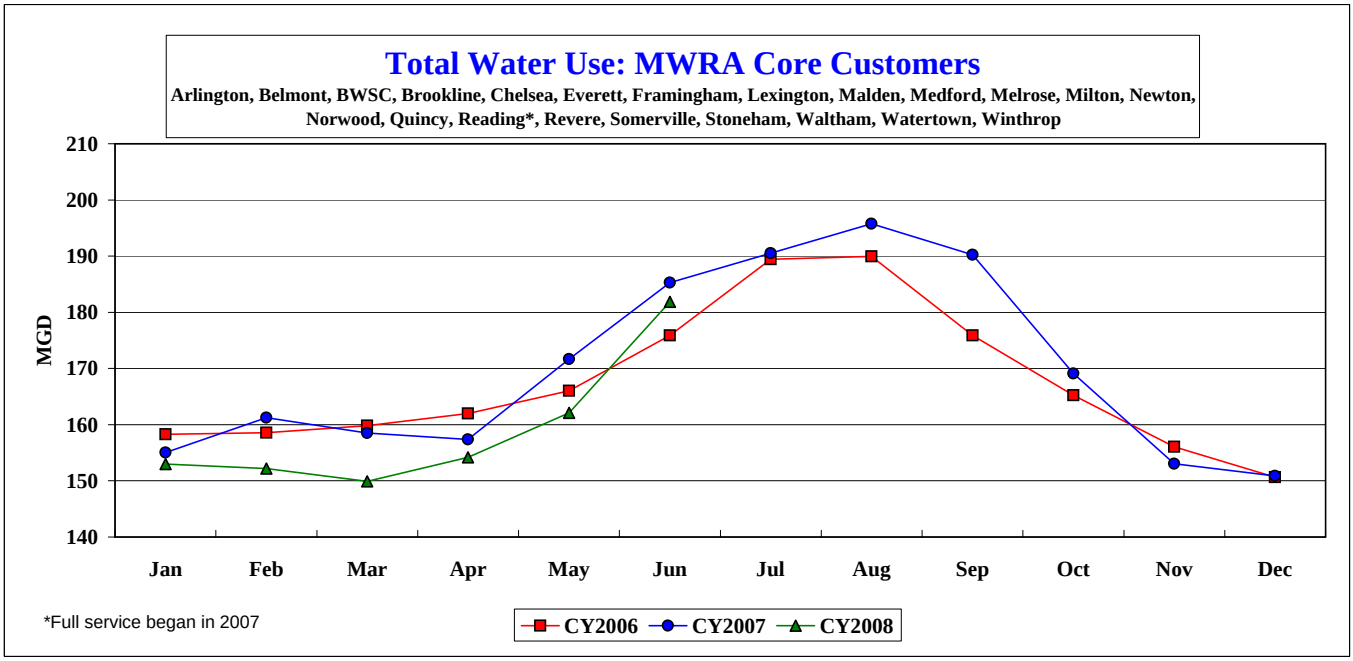

This graph depicts the average monthly flow, measured in million gallons per day, entering the plant. The average monthly flow in April (3.08 mgd) did not meet the permit limit.

# COMMUNITY FLOWS

# Total Water Use: MWRA Core Customer Communities

| MGD | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CY2006 | 158.305 | 158.563 | 159.814 | 161.991 | 166.013 | 175.903 | 189.446 | 189.942 | 175.866 | 165.227 | 156.078 | 150.623 | 167.385 |
| CY2007 | 155.061 | 161.227 | 158.519 | 157.376 | 171.642 | 185.297 | 190.539 | 195.762 | 190.260 | 169.111 | 153.066 | 150.887 | 169.949 |
| CY2008 | 153.011 | 152.183 | 149.899 | 154.173 | 162.083 | 181.872 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 158.843 |

| MG | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CY2006 | 4,907.441 | 4,439.761 | 4,954.227 | 4,859.730 | 5,146.393 | 5,277.092 | 5,872.840 | 5,888.199 | 5,275.991 | 5,122.038 | 4,682.351 | 4,669.320 | 61,095.384 |
| CY2007 | 4,806.893 | 4,514.365 | 4,914.084 | 4,721.268 | 5,320.891 | 5,558.920 | 5,906.704 | 6,068.612 | 5,707.813 | 5,242.433 | 4,591.980 | 4,677.497 | 62,031.459 |
| CY2008 | 4,743.336 | 4,413.302 | 4,646.877 | 4,625.201 | 5,024.567 | 5,456.170 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 28,909.453 |



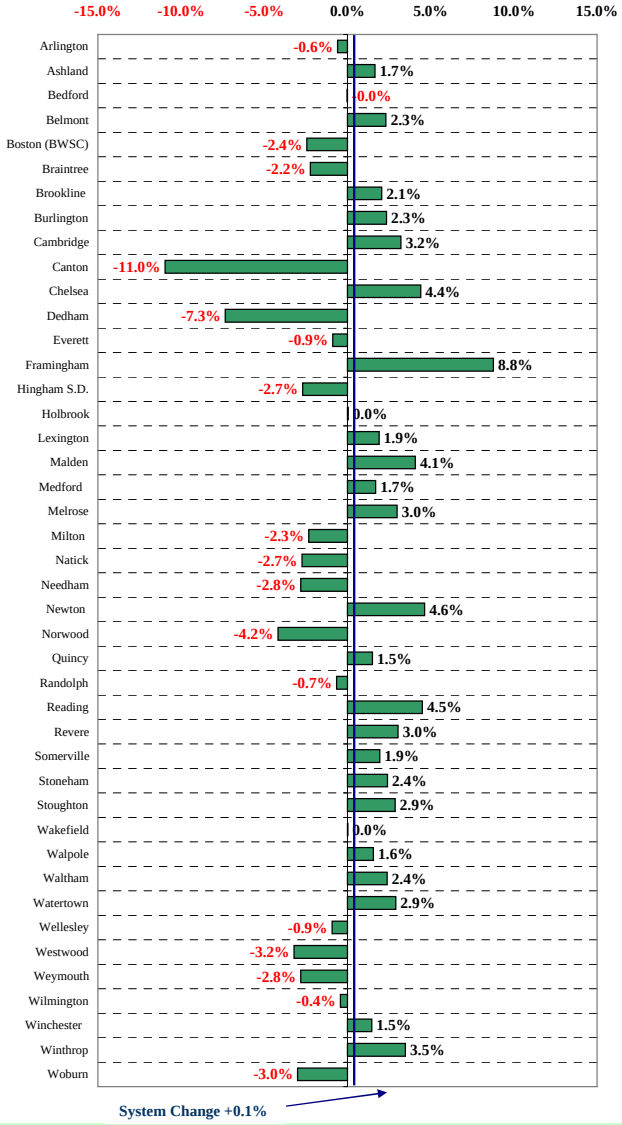
# How CY2008 Community Wastewater Flows Through Six Months Could Effect FY2010 Sewer Assessments [1,2,4]

**FY2010 sewer assessments will use a 3-year average of CY2006 to CY2008 wastewater flows compared to FY2009 assessments that used a 3-year average of CY2005 to CY2007 wastewater flows.** →

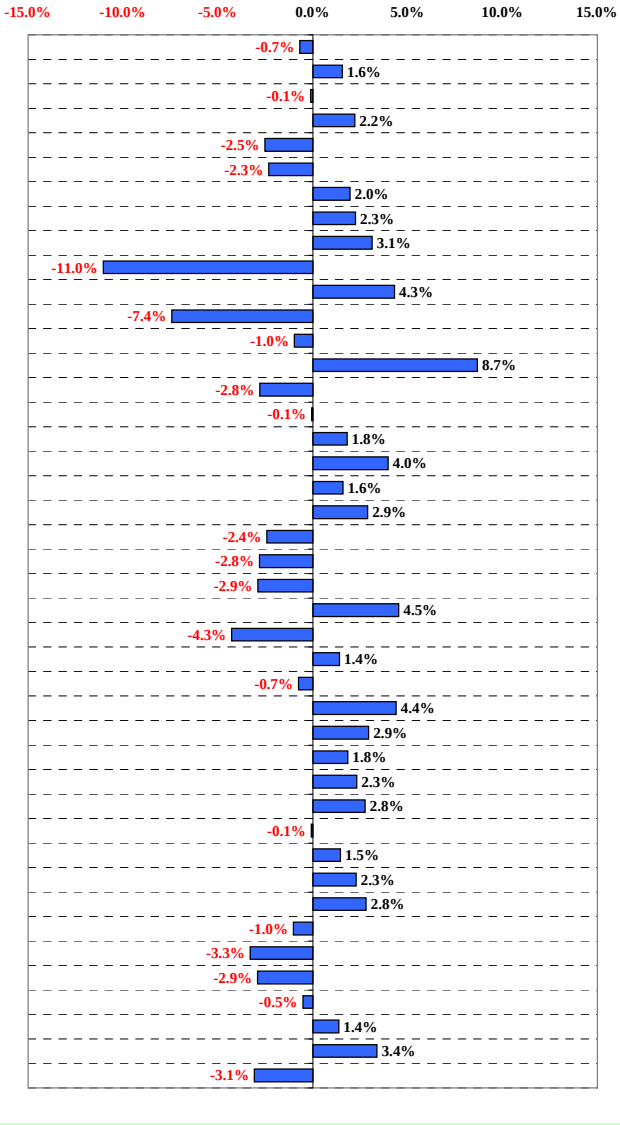
**But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2006 to CY2008 flow share compared to CY2005 to CY2007 flow share, compared to all other communities in the system.** →

**Changes in flow shares are only a part of the assessment calculation as illustrated by the estimated impact of flow share changes on FY2010 sewer assessments.**

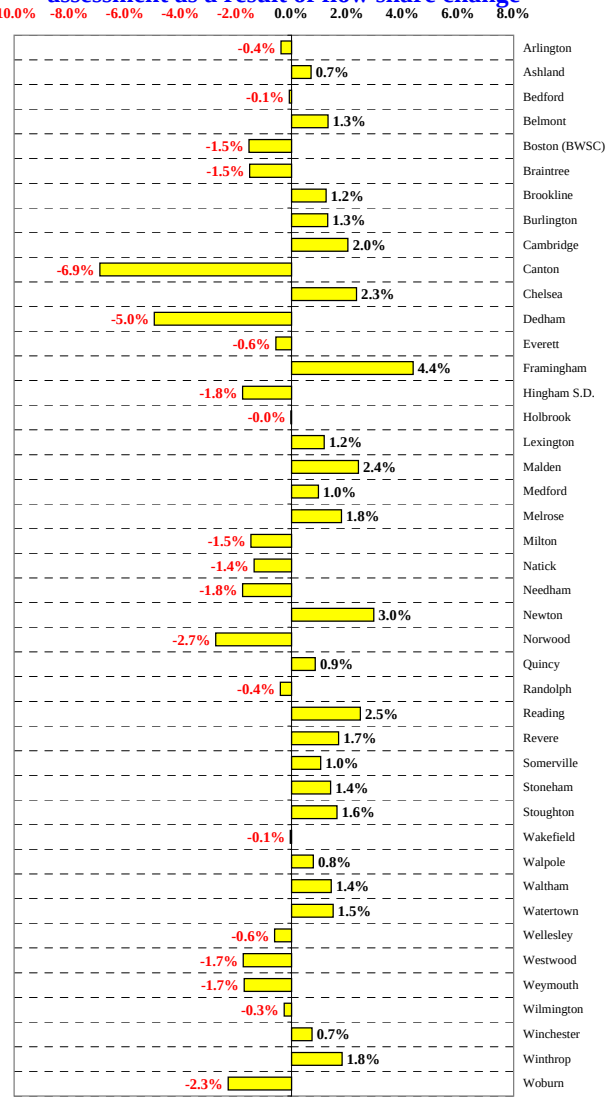
## Change in community absolute flow




## Change in community flow share




## Estimated variance from average system assessment as a result of flow share change [3]




[1] MWRA uses a 3-year moving 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] MWRA's wastewater metering system replacement began in March 2004 and was completed in March 2005. Therefore, wastewater flows for each month during this period are an average of the three prior years. Flow data is preliminary and subject to change pending additional MWRA and community review.

[3] Add this figure to the projected FY2010 system-wide average sewer rate increase of 9.5% (June 2008) to estimate each communitiy's FY2010 sewer assessment change from FY2009.

[4] Based on CY2006 to CY2008 average wastewater flows as of 08/25/08.

# BUSINESS SERVICES

# Procurement: Purchasing and Contracts

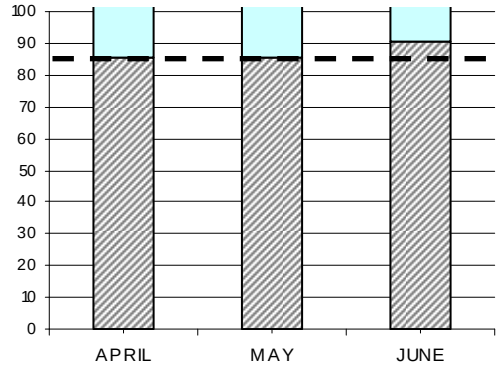
Fourth Quarter FY08

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

**Outcome:** Processed 87% of purchase orders within target; Avg. Processing Time was 5.49 days vs. 6.22 days in Qtr 4 of FY07. Processed 74% (28 of 38) contracts within target timeframes; Avg. Processing Time was 104 days vs. 163 days in Qtr 4 of FY07.

## Purchasing

**Purchase Orders - Percent in Target**




| | NO. | TARGET | PERCENT IN TARGET |
|---|---|---|---|
| $0 - $500 | 1100 | 4 DAYS | 85.7% |
| $500 - $2K | 757 | 7 DAYS | 90.6% |
| $2K - $5K | 288 | 10 DAYS | 81.3% |
| $5K - $10K | 98 | 25 DAYS | 89.8% |
| $10K - $25K | 94 | 30 DAYS | 87.2% |
| $25K - $50K | 38 | 60 DAYS | 89.5% |
| OVER $50K | 33 | 80 DAYS | 97.0% |

- Purchasing Unit processed 2408 purchase orders, 53 more than the 2355 processed in Qtr 4 of FY07, for a total value of $9,819,114 vs. a dollar value of $9,649,196 in Qtr 4 of FY07.

- The target was not achieved for the $2k - $5k category due to confirmation of specifications, sourcing of alternate vendors and changes in specifications/end user needs.

## Contracts, Change Orders and Amendments

- Procurement processed thirty-eight contracts with a value of $13,287,488 and eleven amendments with a value of $414,000.

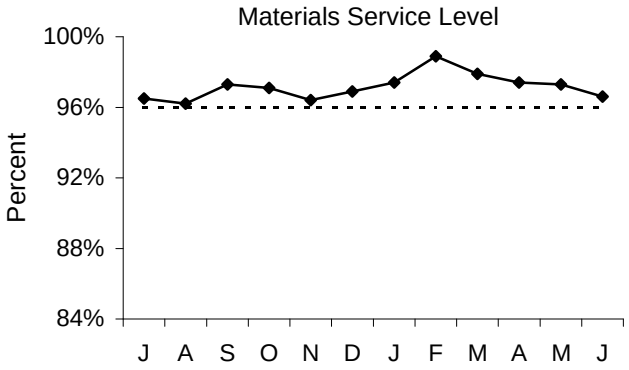
- Ten contracts were not processed within target timeframes. Four contracts were re-bid, two contracts exceeded target timeframes but adhered to the originating department's schedule, two contracts had significant changes in scope, and two contracts were processed within ten days of target timeframe.

- Thirty-six change orders were executed during the period, but several were large balancing change orders at the end of jobs, and are recorded as credits or negative numbers. The dollar value of all non-credit change orders during the 4th quarter FY08 was $837,788 and the value of credit change orders was ($1,167,828). The net dollar value of all change orders was ($330,040).

- In addition, staff reviewed 117 proposed change orders and 37 draft change orders.

# Materials Management

4th Quarter, FY08




The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 10,355 (97.1%) of the 10,661 items requested in Q4 from the inventory locations for a total dollar value of $1, 062,200.

**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 FY08 goal is to reduce consumable inventory from the July '07 base level ($6.67million) by 2.0% (approximately $133, 411), to $6.53 million by June 30, 2008 (see chart below). This goal was not met, but surplus efforts are ongoing with the Chelsea, Deer Island and Southboro warehouses for both consumables and spare parts.

Items added to inventory this quarter include:

- Deer Island - relays, overloads, ballasts, bushings, couplings, flowmeters and bottles for Electrical, Maintenance,
- Plumbing, I&C and Lab.
- Chelsea - filters for VMM, servers, hard hats, hoses and wiper blades for Operations and servers, monitors and towers for MIS.
- Southboro - miscellaneous plumbing supplies, flourescent lamps and clothing for Operations.

Property Pass Program:

- Over the past quarter numerous obsolete items (computers/plotters) have been recycled through our established recycling vendor.
- In addition, various metals have been scrapped providing a monetary return of $24,764.
- Tool/equipment audits continue throughout Operations and surplusing efforts are ongoing.

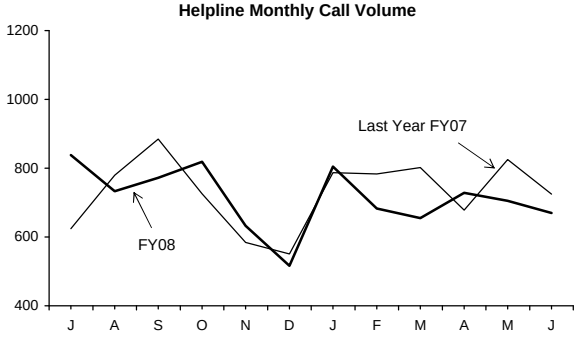
| **Items** | Base Value July-07 | Current Value w/o Cumulative New Adds | Reduction / Increase To Base |
|---|---|---|---|
| Consumable Inventory Value | 6,670,582 | 6,718,809 | 48,227 |
| Spare Parts Inventory Value | 6,481,356 | 6,576,650 | 95,294 |
| Total Inventory Value | 13,151,938 | 13,295,459 | 143,521 |

**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
4th Quarter FY08

Operations

**Helpline Monthly Call Volume**



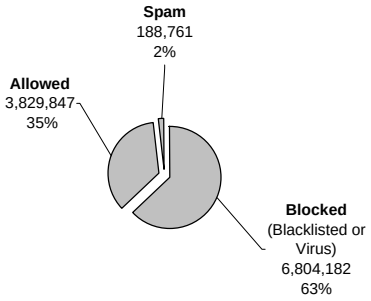

Performance

A total of 8,557 calls were received for the year of which 87% were closed within 3 business days (target is 90%). Overall call volume decreased by 2.21% from last year. The backlog peaked in April and finished the year above the targeted benchmark range. The mix of calls for the quarter do not indicate any major problems.

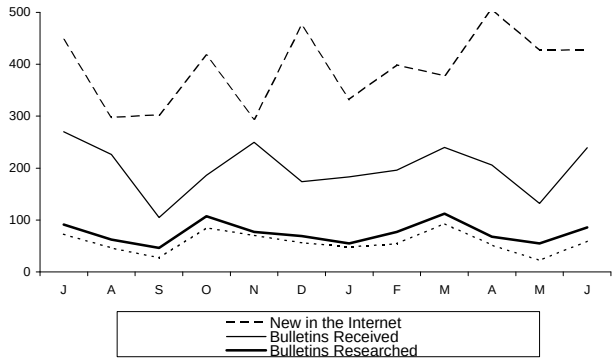
Business System Plan

- Cyber Security: During Q4, the AlertCon status from ISS primarily remained at Level 1 with several brief jumps to Level 2 due to highly critical vulnerabilities in Windows and Internet Explorer. Staff continued to push monthly security fixes to desktops and servers in order to protect against the 1362 newly revealed vulnerabilities during the quarter.
- 9 infected files were quarantined and either repaired or removed from MWRA computers this quarter.

**Emails Received**




**Internet Vulnerabilities**




- Network Redesign and Cost Savings - The Frame Relay network providing connectivity between MWRA sites was retired in April and has been replaced by a MPLS (Multiprotocol Switching) Network. MPLS technology will provide monthly cost savings with the added benefit of higher availability. Network staff worked with Verizon to test the IP routing to ensure successful multipath routing between sites. Charlestown (CNY) will be the last site to be migrated to MPLS from the existing SONET network.

- DITP Server Upgrade: Completed the upgrade of the DITP PI server from version 3.3 to 3.4 (PR1). This system monitors approximately 11,000 data points from the Deer Island process control system, processes an estimated 350 events per second and archives 50 of these events for long term storage. A substantial benefit is gaining the ability to perform online backups without shutting down the system. This advantage also eliminates the need to postpone backups due to wet weather events. Additionally, there is over 8 years of data that will be available online. The current PI server has reached its storage capacity, which is approx. 5+ years worth of data. The new server will be able to store up to 14 years of data (if necessary).
- Internet Access Policy: MWRA's revised Internet Access Policy went into effect on April 1st. Following the implementation, Network staff have implemented many exceptions to the general policy for individual staff, approved by their department director, to ensure staff have appropriate access to websites necessary to conduct MWRA business.

**Applications/Training**

| Area | Significant Accomplishments |
|---|---|
| A&F | Lawson payroll team participated in the MWRA's Hurricane preparedness drill by running a complete parallel payroll from the Deer Island Data Center. This test demonstrated that the Lawson backup server and printers are functioning properly and ready in the event of an emergency. |
| PIMS (TRAC-IS Replacement) | The PIMS implementation team successfully completed the Conference Room Pilot phase of the project. Approximately 30 software anomalies requiring immediate fixes were identified and logged with all but one being fixed before proceeding onto User Acceptance Testing (UAT). |
| Lawson Upgrade | The application is successfully running on both nodes of the Chelsea cluster and installation on the DI Disaster Recovery and Test Systems is scheduled for July. The Lawson application team continues reviewing and modifying the hundreds of custom programs required for the system upgrade. Additionally, the Finance Division has successfully completed a parallel month-end close using Lawson MS Add-ins to test the tool's ability to accurately import data into Lawson that replaces a manual data entry process. Lawson MS Add-ins will help the end users enter General Ledger data more quickly and accurately. |
| Training | For the quarter, 96 staff attended 20 classes and 5 workshops. In FY08, 266 staff attended 66 classes and 28 workshops. 17% of the workforce attended at least one class. Class offerings included MS Office applications training, MAXIMO (Maintenance Management Application) for FOD and DI, Lawson (HR/Payroll/Financial Applications) training, Records Management, PI (Plant Information) Process Book and Data Link, ArcPad (GIS Mobile Redlining), HTML and Web Design training as well as Cyber Security Brown Bag Presentation. |

# Legal Matters
## 4th Quarter FY2008

## PROJECT ASSISTANCE

COURT AND ADMINISTRATIVE ORDERS

- **Boston Harbor Litigation and CSO**: Reviewed Proposed Modification of Long-Term Level of Control for the Prison Point CSO Facility, 2008 which was submitted to EPA and DEP. Filed Motion to Amend Second Stipulation of the United States and MWRA on Responsibility and Legal Liability for Combined Sewer Overflow. Reviewed notice of intent to sue EPA regarding EPA's actions with respect to approval of MADEP's issuance of a variance extension for Alewife Brook/Upper Mystic River. Reviewed recent revisions to memorandum of understanding and financial assistance agreement between MWRA and the City of Cambridge for CSO control projects. Filed Quarterly CSO Progress Report and CSO Annual Report with the Court. Reviewed drafts of amendment 8 to memorandum of understanding and financial assistance agreement with City of Cambridge for the implementation of CSO projects.

- **NPDES**: Reviewed final draft of proposed Supplemental Environmental Projects and Stipulation and Order related to blending enforcement action. Submitted letter agreement to City of Boston relative to sewage pumpout boat which is being purchased as part of a supplemental environmental project. Reviewed written notification of an unintentional discharge of digested sludge from the Deer Island Treatment Plant to Broad Sound through a storm drain on Deer Island, which occurred on May 17, 2008. Reviewed final draft proposals for the United States' motion for leave to file supplemental complaint, supplemental complaint, and stipulation and order, and MWRA's response to the United States' motion, which are part the United States' blending enforcement action against MWRA.

- **Administrative Consent Order (DITP power outages)**: Submitted semi-annual report to DEP in accordance with the Administrative Consent Order.

- **Administrative Order (Clinton Wastewater Treatment Plant)**: Submitted Annual Copper Optimization Report No. 6.

REAL ESTATE AND CONTRACT

- **Fore River Railroad Corporation;** Continued negotiation with MBTA concerning construction of pedestrian crossing and drainage facilities at FRRC railroad easement. Met with staff re: engine house status and nature of lease or license arrangement between MWRA and FRRC.

- **Section 97A, East Boston:** Made final revisions to MBTA construction license. Obtained executed license.

- **East Boston Branch Sewer Relief:** Revised license agreements with Boston Parks Department and Boston Public Schools. Obtained executed agreements. Revised easement agreement with BWSC. Prepared order of taking and related eminent domain documents.

- **South Sudbury:** Attended various meetings with staff concerning draft of survey scope of work and status of in-house survey work. Revised disposition maps. Met with staff concerning retention of access easements.

- **Hultman Interconnections Project:** Revised temporary easement plans. Revised draft License Agreement with Liberty Mutual and forwarded for review and comment.

- **MWRA Meter 32 – Somerville.** Revised easement plan: Resolved issues of corporate merger. Prepared draft license agreement with 7 – Eleven, Inc.

- **Brookline Transformer House:** Reviewed with town counsel ownership issues at transformer house located at Warren and Boylston Streets. Met with MWRA staff and reviewed available documentation.

- **DCR Watershed Lands:** Reviewed 12 DCR/DWSP watershed parcel acquisition packages prior to end of fiscal year.

- Advised on warranty and other contract matters for Operations Division and Procurement staff; reviewed final draft legislation relative to act to protect the public trust and safeguard of ocean resources; drafted memorandum on the enforceability of an 8(m) permit that includes a release from liability that MWRA might subsequently incur as a result of its own negligence; met with operations staff to discuss potential settlement of claims against consultants relating to the Union Park and Braintree-Weymouth Intermediate Pumping Station projects; reviewed and provided comments on the response to the feasibility report and supplemental environmental impact report for the Boston Harbor deep Draft Navigational Improvement project; met with the State Plumbing Board and reviewed and revised the draft Memorandum of Understanding; advised on a draft letter to the Town of Ludlow regarding the Town's fencing complaints; corresponded with opposing counsel regarding damage to MWRA equipment; met with staff regarding three claims made by the pellet plant operator; provided counsel regarding strategy going forward on warranty issues with Ozone generator manufacturer; provided support in a bid protest for MWRA contract No. 5177 filed by Revoli Construction Co.; drafted amendments to two Tolling Agreements with design consultants; drafted a Settlement Agreement and Release to resolve claims against a design consultant; drafted a Release and Settlement Agreement to close out a construction contractor claim; advised AACU regarding provision of MBE and WBE requirements by the same subcontractor; met with representatives of NStar to discuss the possibility of entering into the forward capacity market; provided support, including deposition transcript review, other miscellaneous document review, conferences with opposing and co-counsel, attendance and support at depositions, in the Seaver and Chappy litigations; reviewed and approved 20 Section 8(m)permits. Recorded various Orders of Conditions, Orders of Taking, Certificates of Compliance, Extension permits at various Registries of Deeds for MWRA engineers and staff.

ENVIRONMENTAL

- **Beede Superfund Case**: Provided analysis and advice for joining the motion filed by several other large *de minimus* potential responsible parties (PRPs) in the case in support of the Beede Superfund Consent Decree; discussed with other PRP representatives the proceedings of the subsequent court hearing on EPA's motion to the enter the Consent Decree which seem to indicate the judge would approve the Consent Decree.

- **Groundwater**: Reviewed, compared and commented upon most recent version of proposed state legislation regulating the use of groundwater resources, particularly those portions which focused on activities impacting groundwater levels and liability for damages resulting there from.

- **NPDES Discharge Permits**: Reviewed EPA's proposed 2008 NPDES General Permit for Stormwater Discharges from new dischargers engaged in large and small construction activities; no significant changes noted from previous General Permit.

MISCELLANEOUS

Analyzed options for streamlining of MEPA and IBT regulatory reviews for potential system expansion initiative; provided advice for completion of work to surplus remainder of Framingham South Sudbury parcels; drafted proposed revisions to 8(m) permits re: release from potential damage claims; resolved lease vs. license issue with respect to railroad engine house; provided input for revisions to Cambridge MOU/FAA; coordinated drafting of counter-memorandum responding to allegations in EPA/DOJ enforcement Complaint; negotiated terms of resolution of Central Artery adjudicatory appeal by way of dismissal of claims.

## LABOR, EMPLOYMENT AND ADMINISTRATIVE

*New Matters:*

One demand for arbitration was filed.

One Massachusetts Commission Against Discrimination ("MCAD") charge was filed.

*Matters Concluded:*

Received two arbitration decisions in favor of the MWRA.

Union withdrew a demand for arbitration after informal discussions about the merits of the case.

## LITIGATION/TRAC

*New Matters:*

Three new cases were reported in the Fourth Quarter of FY 2008.

William A. and Mary J. Davison & Paul DiMaura, Trustees of Heather Realty Trust v. MWRA: Plaintiffs allege that on or about April 13, 2005, MWRA, in connection with the Upper Neponset Valley Replacement Sewer project, made a taking of permanent rights and easements, for sewer purposes, to construct, inspect, repair, renew, replace, operate and forever maintain and sewer line in and under certain parcels of land owned by the Plaintiffs at 1625 V.F.W. Parkway, West Roxbury. Plaintiffs also allege that MWRA made a taking of temporary rights and easements for sewer purposes, to use and occupy for the passage of workers and vehicles, the transportation of machinery and materials, for construction and the storage of construction materials and equipment and for depositing machinery, tools, dirt and other materials thereon, together with the right to remove said machinery, tools, dirt and other materials thereon in and through the subject parcels of land owned by the Plaintiffs. Plaintiffs seek unspecified money damages.

RE: (Current Employee): Agent for American Student Assistance Corp: Delta Management Associates, Inc.: An Order of Withholding 15% from earnings was received in May 2008 for an employee's debt of a student loan.

Edward G. Sawyer Co., Inc. v. Seaver Electric Corp., et al. Related Case: Seaver Electric, Inc. v. J.F. White Contracting Co., Inc., et al.: This is a construction contract action by Edward G. Sawyer Co., Inc. against Seaver Electric Corporation for monies allegedly owed by Seaver under an Asset Purchase and Contractor Agreement dated July 13, 2005. MWRA is named as a "reach and apply defendant", by which Sawyer seeks a Court Order requiring MWRA to pay directly to Sawyer any monies which MWRA may eventually be found to owe to Seaver in another lawsuit. A hearing on Sawyer's Amended Motion to Reach and Apply was scheduled to be heard on Friday, July 11, 2008.

*Significant Developments:*

Exelon Edgar LLC, et al. v. MWRA: Following the jury's verdict of $11 million in early December, 2007 in favor of plaintiffs, which nets out to approximately $7.85 million of new money over amounts previously paid for takings of Exelon property, MWRA successfully opposed plaintiffs' motions to establish a 15% interest rate on the verdict which would have essentially doubled the recovery allowed by the jury. On April 14, 2008, the court ordered that interest would be calculated pursuant to the statutory rate established by G.L. c. 79, sec. 37 which allows for a fluctuating interest rate tied to one-year treasury bonds considerably lower than the 15% rate sought by the plaintiffs. The Court also held that interest would run on the amounts from the date of each taking or, on $6,017,000 from 8/13/99; on $711,700 from 2/20/01; on $897,000 from 4/10/03; and on $222,500 from 6/24/03. Interest on this award calculated through December 31, 2007 equals $2,164,428. The Court also denied the plaintiffs' motion for costs. While the plaintiffs next requested that the court reconsider its ruling, the court denied that motion on May 1, 2008. It is expected that judgment in the case will enter shortly. Once judgment enters, MWRA will file a motion for a remittitur (reduction of damages) with respect to the South Side damages awarded by the jury and a motion for a new trial with respect to the jury award on the North Side. Once these motions are ruled on by the court, this matter and its many issues will be appealed to the Massachusetts Appeals Court as previously authorized by the Board.

*Concluded Cases:*

There was one case reported closed.

Verizon v. MWRA, et al: Verizon New England ("Verizon") filed suit against MWRA and a co-defendant, Union Power Water Co. ("On Target"), in August 2005 contending that the during the course of excavation work by MWRA on September 23, 2002, MWRA negligently damaged underground cables and conduits owned by Verizon at the intersection of High and Jerome Streets in West Medford. On Target is the company hired by Verizon to mark its underground facilities so that their location is visible to excavators. MWRA during the course of its excavation struck the Verizon cable, but claimed that the area was not properly marked, a fact disputed by On Target. Verizon sought damages of $168,274.04. Slightly over $121,000.00 were labor costs for manual splicing operations that were made necessary by the lack of slack in the cable and close quarters of the excavated site. Ultimately, the parties were able to settle for 60% of Verizon's claim ($100,942.22), with On Target liable for $60,565.33 and MWRA liable for the remaining $40,376.89.

*Subpoenas:*

Two subpoenas were received and one subpoena was pending at the end of Fourth Quarter FY 2008.

*Public Records*:

Thirteen new public records requests were received and four requests were closed at the end of Fourth Quarter FY 2008.

**SUMMARY OF PENDING LITIGATION MATTERS**

| TYPE OF CASE/MATTER | As of June 2008 | As of Mar 2008 | As of Dec 2007 |
|---|---|---|---|
| Construction/Contract/Bid Protest (other than BHP) | 6 | 5 | 5 |
| BHP Claims/Contract Cases | 0 | 0 | 0 |
| Tort/Labor/Employment | 8 | 9 | 10 |
| Environmental/Regulatory/Other | 2 | 2 | 2 |
| Eminent Domain/Real Estate | 2 | 1 | 1 |
| **Total – all defensive cases** | **18** | **17** | **18** |
| Affirmative Cases:<br><br>MWRA v. (current employee) | 1 | 1 | 1 |
| Other Litigation matters (restraining orders, etc.)<br><br>MWRA v. (former employee)<br><br>MWRA v. (former employee) | 2 | 2 | 2 |
| **Total – all pending lawsuits** | **21** | **20** | **21** |
| Significant claims not in suit: CDM Walnut Hill | 1 | 1 | 1 |
| Bankruptcy | 2 | 1 | 1 |
| Wage Garnishment | 7 | 6 | 5 |
| TRAC Appeals | 3 | 4 | 5 |
| Subpoenas | 2 | 2 | 5 |
| Public Records Requests | 13 | 13 | 4 |
| **TOTAL - ALL LITIGATION MATTERS** | **49** | **47** | **42** |

**TRAC**

*New Appeals.* No new appeals were received in the 4th Quarter FY 2008.

*Pre-Hearings Held.* No pre-hearings were held in the 4th Quarter FY 2008.

*Status Conference Held.* No status conferences were held in 4th Quarter FY 2008.

***Joint Motion to Dismiss***

No cases were dismissed by Joint Motion to Dismiss in the 4th Quarter FY 2008.

***Joint Stipulations of Dismissals***

No cases were dismissed by Joint Stipulation after fine was paid in the 4th Quarter FY 2008.

***Joint Stipulations of Dismissals – Claims Dismissed***

No cases were dismissed by Joint Stipulations of Dismissal in the 4th Quarter FY 2008.

*Hearings Held.* No hearings were held in the 4th Quarter FY 2008.

*Settlement By Agreement of Parties.* One case was settled by Agreement of Parties in 4th Quarter FY 2008.

*Tentative Decisions Issued.* No Tentative Decisions were issued in 4th Quarter FY 2008.

*Final Decisions Issued.* No Final Decisions were issued during the 4th Quarter FY 2008.

# Internal & Contract Audit Program

4th Quarter FY08

## INTERNAL AUDIT PROGRAM

**Status of Internal Audit Recommendations**
*Recommendations closed in 4th Quarter: 3*

**Assignments with Recommendations Pending Implementation**

| Report Title (date) | Recommendations Pending Implementation | Closed Recommendations |
|---|---|---|
| Chemical Delivery Procedures (5/5/04) | 1 | 4 |
| Evaluating Consultant Performance (6/22/04) | 1 | 1 |
| Field Operations Maintenance Management Practices (9/16/05) | 3 | 9 |
| Accounts Payable Activities (10/11/05) | 6 | 6 |
| Controls Over Gasoline & Diesel Fuel (5/3/06) | 1 | 15 |
| Field Crew Practices (11/14/06) | 1 | 8 |
| Financial & Management Controls of the Fore River Railroad (3/1/07) | 2 | 5 |
| **Total Recommendations** | **15** | **48** |

The Internal Audit Department follows up on open recommendations on continuous basis. All pending recommendations have target implementation dates. When a recommendation has not been acted on in 48 months the appropriateness of the recommendation is re-evaluated during a subsequent audit. National surveys of government organizations indicate that on average 82% of audit recommendations are completed. On closed assignments 92% of Internal Audit's recommendations have been implemented.

## CONTRACT AUDIT PROGRAM

**Number of Reviews Completed and Cost Savings - FY03 to FY08**

| Description | FY04 | FY05 | FY06 | FY07 | FY08 | TOTAL |
|---|---|---|---|---|---|---|
| **Consultant Reviews** | | | | | | |
| Cost Disclosure Statement Reviews | 78 | 32 | 63 | 43 | 53 | 269 |
| Preliminary Field Reviews | 1 | 4 | 6 | 2 | 0 | 13 |
| Incurred Cost Audits | 9 | 9 | 12 | 10 | 9 | 49 |
| **Contractor Reviews** | | | | | | |
| Construction Labor Burden Reviews | 13 | 10 | 8 | 8 | 14 | 53 |
| Change Order/Claim Audits | 4 | 0 | 0 | 0 | 1 | 5 |
| Contractor Financial Reviews | 3 | 4 | 0 | 2 | 9 | 18 |
| **Cost Savings** | | | | | | |
| Consultant Cost Savings | $779,945 | $483,968 | $768,394 | $358,341 | $55,901 | $2,446,549 |
| Contractor/Vendor Cost Savings | $900,721 | $1,551,139 | $456,968 | $637,378 | $2,147,311 | $5,693,517 |
| Internal Audits | | | | $183,840 | | $183,840 |
| **Total Cost Savings** | **$1,680,666** | **$2,035,107** | **$1,225,362** | **$1,179,559** | **$2,203,212** | **$8,323,906** |

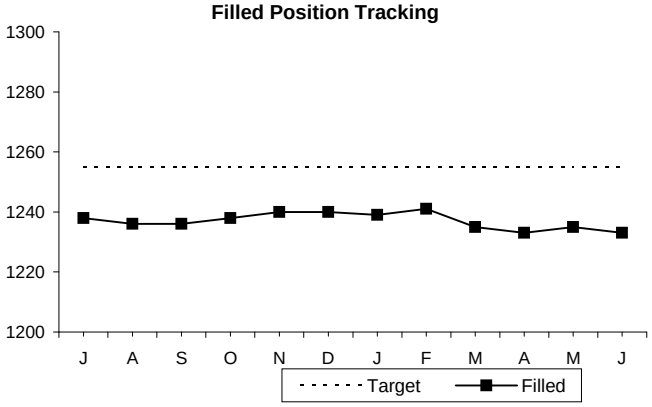
The Internal Audit Department's target is to achieve at least $1 million in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of work in prior years. Commencing in FY07 cost savings will include the dollar impact, if measurable, of internal assignments.

# OTHER MANAGEMENT

# Workforce Management

4th Quarter FY08

**Filled Position Tracking**

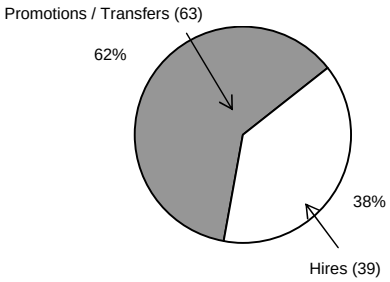



FY08 Target for Filled Positions = 1255

Filled Positions as of June 2008 = 1233

**Positions Filled by Hires/Promotions**

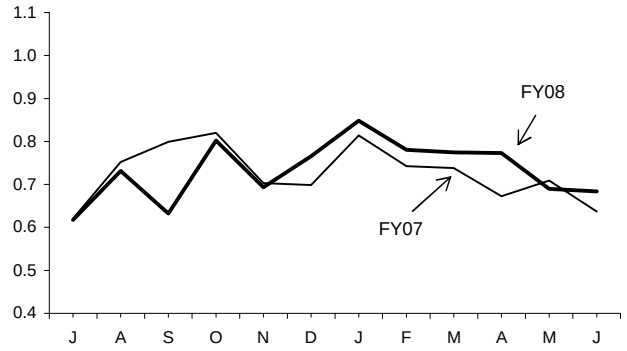
FY08




| | Pr/Trns | Hires | Total |
|---|---|---|---|
| FY05 | 97 (66%) | 49 (34%) | 146 |
| FY06 | 41 (65%) | 22 (35%) | 63 |
| FY07 | 52 (56%) | 41(44%) | 93 |

**Average Monthly Sick Leave Usage**

Per Employee



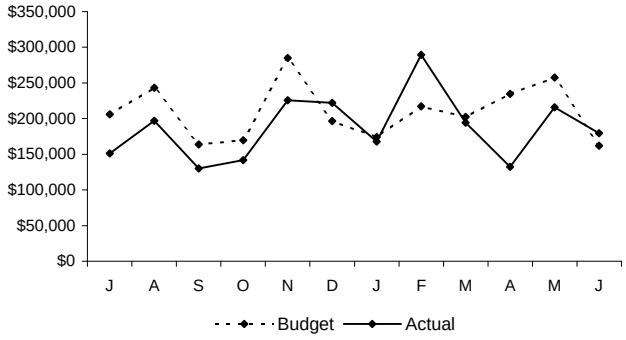

The average annual sick leave usage for FY08 at 8.79 days is comparable to the FY07 level (8.71 days).

| | Number of Employees | YTD | Annualized Total | Annual FMLA % | FY07 |
|---|---|---|---|---|---|
| Law | 19 | 8.73 | 8.73 | 11.8% | 11.17 |
| Planning | 24 | 6.91 | 6.91 | 11.4% | 5.84 |
| Operations | 962 | 8.94 | 8.94 | 19.8% | 8.95 |
| Support | 195 | 8.46 | 8.46 | 21.7% | 7.62 |
| Finance | 40 | 8.64 | 8.64 | 13.0% | 9.58 |
| Executive | 7 | 5.18 | 5.18 | 0.0% | 3.72 |
| **MWRA Avg** | **1247** | **8.79** | **8.79** | **19.5%** | **8.71** |

Percent of sick leave usage attributable to Family and Medical Leave Act (FMLA) leave is 19.5% ending June 30, 2008.

**Field Operations**

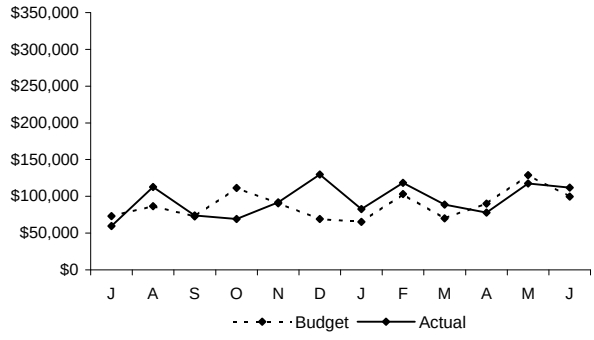
Overtime Expenditure Variance




Field Operations overtime spending in the fourth quarter was $127,000 (19.4%) less than budgeted, primarily due to lower-than-anticipated rainfall.

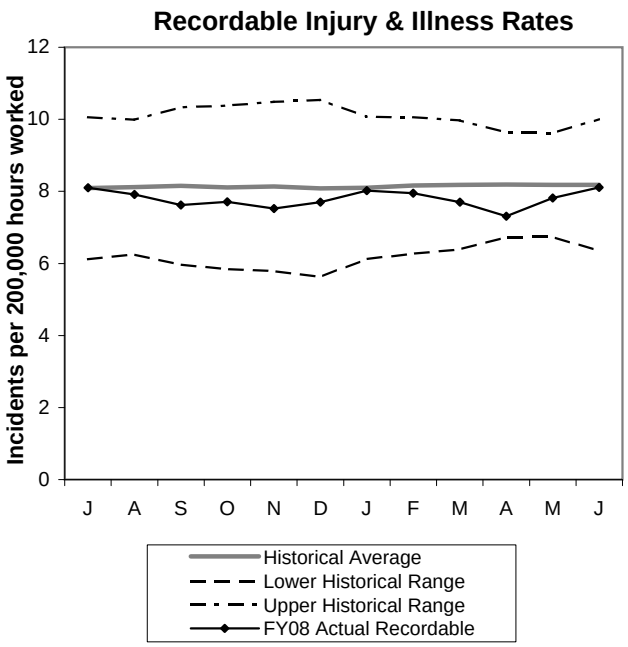
**Deer Island Treatment Plant**

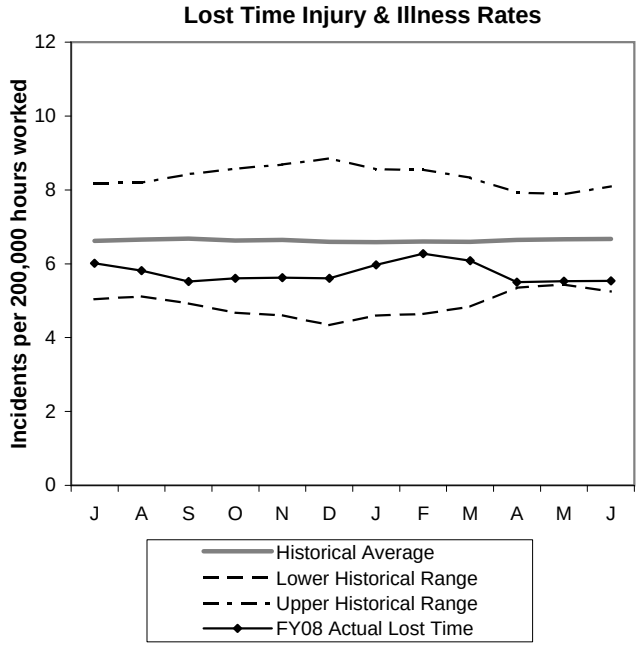
Overtime Expenditure Variance




Deer Island overtime spending in the fourth quarter was $11,300 (3.6%) less than budgeted.

# Workplace Safety
# 4th Quarter FY08




1 “Recordable" incidents are all work-related deaths and illnesses, and those work-related injuries which result in loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid.

2 "Lost-time" incidents, a subset of the recordable incidents, are only those incidents resulting in any days away from work, days of restricted work activity or both - beyond the first day of injury or onset of illness.

3 The “Historical Average” is computed using the actual MWRA monthly incident rates for FY99 through FY07. The “Upper” and “Lower Historical Ranges” are computed using these same data – adding and subtracting two standard deviations respectively. FY08 actual incident rates can be expected to fall within this historical range.

**Workers Compensation Claims Highlights**

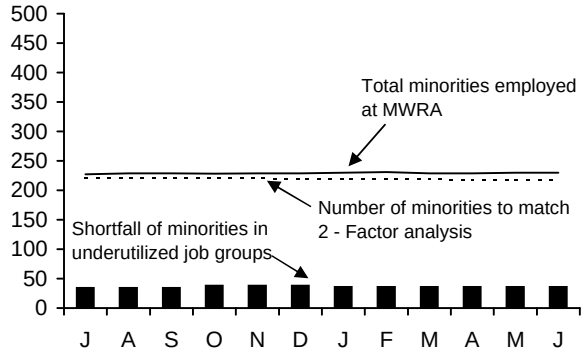
| | New | Closed | Open Claims |
|---|---|---|---|
| Lost Time | 6 | 12 | 39 |
| Medical Only | 35 | 14 | 26 |
| | | | |
| | **New** | | **YTD Returns** |
| Light Duty Returns | 1 | | 12 |

- **Light Duty Returns:**

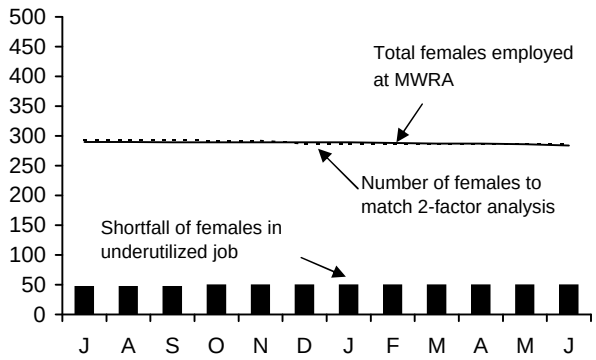
  1 Metro Maintenance employee to Acting Stock Clerk and 1 week later to full duty.

# MWRA Job Group Representation
# Quarter 4, FY 2008

**Minority - Affirmative Action Plan**




**Female - Affirmative Action Plan**




**Highlights:** At the end of Q4 FY08, 9 job groups or a total of 40 positions are underutilized by minorities as compared to 9 job groups or a total of 36 at the end of Q4 FY07; for females 11 job groups or a total of 82 positions are underutilized by females as compared to 9 job groups or a total of 49 at the end of Q4 FY07. During Q4, 2 minorities were hired and 2 females terminated.

## Underutilized Job Groups - Workforce Representation

| Job Group | Employees as of 6/30/2008 | Minorities as of 6/30/2008 | Achievement Level | Minority Over or Under Under utilized | Females As of 6/30/2008 | Achievement Level | Female Over or Under Under utilized |
|---|---|---|---|---|---|---|---|
| Administrator A | 20 | 2 | 1 | 1 | 3 | 4 | -1 |
| Administrator B | 25 | 0 | 4 | -4 | 6 | 7 | -1 |
| Clerical A | 51 | 24 | 10 | 14 | 44 | 12 | 32 |
| Clerical B | 40 | 7 | 9 | -2 | 16 | 3 | 13 |
| Engineer A | 86 | 16 | 11 | 5 | 13 | 11 | 2 |
| Engineer B | 54 | 9 | 5 | 4 | 8 | 19 | -11 |
| Craft A | 118 | 15 | 21 | -6 | 0 | 8 | -8 |
| Craft B | 151 | 28 | 19 | 9 | 4 | 7 | -3 |
| Laborer | 64 | 15 | 10 | 5 | 4 | 8 | -4 |
| Management A | 100 | 18 | 19 | -1 | 31 | 37 | -6 |
| Management B | 57 | 9 | 12 | -3 | 13 | 27 | -14 |
| Operator A | 70 | 6 | 7 | -1 | 3 | 2 | 1 |
| Operator B | 77 | 9 | 11 | -2 | 4 | 3 | 1 |
| Para Professional | 62 | 10 | 27 | -17 | 28 | 53 | -25 |
| Professional A | 37 | 2 | 6 | -4 | 22 | 9 | 13 |
| Professional B | 174 | 42 | 29 | 13 | 78 | 77 | 1 |
| Technical A | 48 | 14 | 10 | 4 | 3 | 11 | -8 |
| Technical B | 14 | 4 | 3 | 1 | 4 | 5 | -1 |
| | | | | | | | |
| **Total** | **1248** | **230** | **214.0** | **56/-40** | **284** | **303** | **63/-82** |

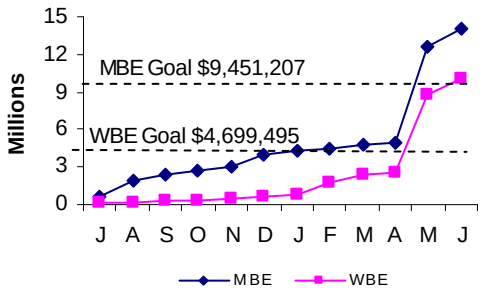
## AACU Candidate Referrals For Underutilized Positions

| Job Group | Title | # of Vac. | Requisition Int. / Ext. | Promotions/ Transfers | AACU Ref. External | Position Status |
|---|---|---|---|---|---|---|
| Administrative A | Controller | 1 | Ext | 0 | 3 | Pending |
| Clerical B | Materials Handler | 1 | Int/Ext | 1 | 0 | Trans - W/F |
| Craft A | Vehicle Services Supervisor | 1 | Int | 1 | 0 | Promo - B/M |
| | Unit Supervisor | 2 | Int | 0 | 0 | Pending |
| | Sr. WDS Foreman | 2 | Int | 0 | 0 | Pending |
| Craft B | Motor Equipment Rep | 1 | Ext | 0 | 0 | New Hire - W/M |
| | Motor Equipment Rep | 1 | Ext | 0 | 0 | Pending |
| | Jr. Instrument Technician | 1 | Ext | 0 | 0 | Pending |
| Engineer A | Assets Manager | 1 | Int | 0 | 0 | Pending |
| Laborers | Skilled Laborer | 1 | Ext | 0 | 0 | Pending |
| Management A | Mgr. Finance & Admin | 1 | Int | 1 | 0 | Promo - W/M |
| | Sr. Prog. Mgr. Metro Trades | 1 | Int | 0 | 0 | Pending |
| | Mgr. Wastewater Ops. | 1 | Int/Ext | 0 | 0 | Pending |
| | Sr. Prog Mgr. PC&PS | 1 | Int/Ext | 0 | 0 | Pending |
| Operator B | Operator | 1 | Int/Ext | 0 | 0 | New Hire - B/M |
| Para Professional | Admin. Sys. Coord. | 1 | Int | 1 | 0 | Promo - W/F |

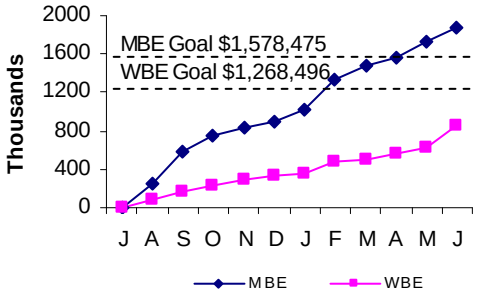
# MBE/WBE Expenditures
## Fourth Quarter 2008

**Background**: MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. MBE/WBE percentage goals, resulting from a 2002 Availability Analysis, are applied to the MWRA CIP and CEB expenditure forecasts. As a result of the Availability Analysis, the category of Non-Professional Services is included in Goods/Services. Consistent with contractor reporting requirements, MBE/WBE expenditure data is available through June.

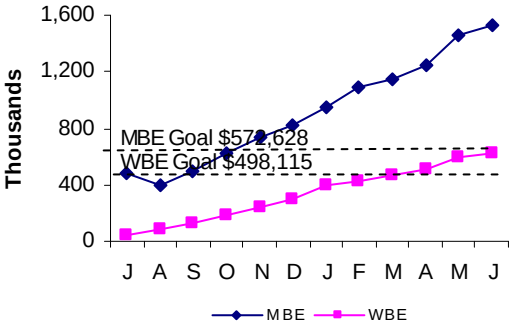
**Construction**




**Professional**




**Goods/Services**




FY08 spending and percentage of goals achieved, as well as FY07 performance are as follows:

| | MBE | | | | WBE | | | |
|---|---|---|---|---|---|---|---|---|
| | FY08 Year-to-Date | | FY07 | | FY08 Year-to-Date | | FY07 | |
| | Amount | Percent | Amount | Percent | Amount | Percent | Amount | Percent |
| Construction | 13,681,272 | 144.8% | 4,303,492 | 55.1% | 9,999,226 | 212.8% | 3,789,881 | 97.6% |
| Professional Svc. | 1,867,312 | 118.3% | 1,602,317 | 117.6% | 863,795 | 68.1% | 773,737 | 70.7% |
| Goods & Svcs. | 1,523,765 | 266.1% | 1,188,886 | 164.2% | 627,752 | 126.0% | 312,234 | 49.6% |
| Total | $17,072,349 | 147.1% | $7,094,695 | 71.7% | $11,490,773 | 177.7% | $4,875,852 | 86.9% |

# MWRA FY08 CEB Expenses through June 2008

| | June 2008 Year-to-Date | | | | | |
|---|---|---|---|---|---|---|
| | Period 12 YTD Budget | Period 12 YTD Actual | Period 12 YTD Variance | % | FY08 Approved | % Expended |
| **EXPENSES** | | | | | | |
| WAGES AND SALARIES | $ 88,091,461 | $ 86,452,409 | $ (1,639,052) | -1.9% | $ 88,091,461 | 98.1% |
| OVERTIME | 3,864,290 | 3,770,660 | (93,630) | -2.4% | 3,864,290 | 97.6% |
| FRINGE BENEFITS | 16,271,444 | 15,594,183 | (677,261) | -4.2% | 16,271,444 | 95.8% |
| WORKERS' COMPENSATION | 1,400,000 | 1,159,464 | (240,536) | -17.2% | 1,400,000 | 82.8% |
| CHEMICALS | 8,702,932 | 8,642,802 | (60,130) | -0.7% | 8,702,932 | 99.3% |
| ENERGY AND UTILITIES | 26,532,695 | 25,975,019 | (557,676) | -2.1% | 26,532,695 | 97.9% |
| MAINTENANCE | 25,768,810 | 26,408,816 | 640,006 | 2.5% | 25,768,810 | 102.5% |
| TRAINING AND MEETINGS | 222,252 | 225,995 | 3,743 | 1.7% | 222,252 | 101.7% |
| PROFESSIONAL SERVICES | 7,869,287 | 6,670,261 | (1,199,026) | -15.2% | 7,869,287 | 84.8% |
| OTHER MATERIALS | 5,022,858 | 5,427,462 | 404,604 | 8.1% | 5,022,858 | 108.1% |
| OTHER SERVICES | 22,893,395 | 22,092,301 | (801,094) | -3.5% | 22,893,395 | 96.5% |
| **TOTAL DIRECT EXPENSES** | **$ 206,639,424** | **$ 202,419,372** | **$ (4,220,052)** | **-2.0%** | **$ 206,639,424** | **98.0%** |
| INSURANCE | $ 2,500,000 | $ 2,191,342 | $ (308,658) | -12.3% | $ 2,500,000 | 87.7% |
| WATERSHED/PILOT | 23,207,147 | 23,216,874 | 9,727 | 0.0% | 23,207,147 | 100.0% |
| BECo PAYMENT | 4,347,200 | 4,132,778 | (214,422) | -4.9% | 4,347,200 | 95.1% |
| MITIGATION | 1,419,223 | 1,409,987 | (9,236) | -0.7% | 1,419,223 | 99.3% |
| ADDITIONS TO RESERVES | 1,654,655 | 471,506 | (1,183,149) | -71.5% | 1,654,655 | 28.5% |
| RETIREMENT FUND | 4,233,329 | 4,258,645 | 25,316 | 0.6% | 4,233,329 | 100.6% |
| POST EMPLOYEE BENEFITS | 7,098,896 | 7,098,896 | - | 0.0% | 7,098,896 | 100.0% |
| **TOTAL INDIRECT EXPENSES** | **$ 44,460,450** | **$ 42,780,028** | **$ (1,680,422)** | **-3.8%** | **$ 44,460,450** | **96.2%** |
| DEBT SERVICE | $ 330,627,700 | $ 335,862,755 | $ 5,235,055 | 1.6% | $ 330,627,700 | 101.6% |
| DEBT SERVICE ASSISTANCE | (17,250,000) | (16,980,026) | 269,974 | -1.6% | (17,250,000) | 98.4% |
| **TOTAL DEBT SERVICE** | **$ 313,377,700** | **$ 318,882,729** | **$ 5,505,029** | **1.8%** | **$ 313,377,700** | **101.8%** |
| **TOTAL EXPENSES** | **$ 564,477,574** | **$ 564,082,129** | **$ (395,445)** | **-0.1%** | **$ 564,477,574** | **99.9%** |
| **REVENUE & INCOME** | | | | | | |
| RATE REVENUE | $ 517,797,832 | $ 517,797,832 | $ - | 0.0% | $ 517,797,832 | 100.0% |
| OTHER USER CHARGES | 7,565,475 | 14,796,257 | 7,230,782 | 95.6% | 7,565,475 | 195.6% |
| OTHER REVENUE | 5,241,223 | 7,815,285 | 2,574,062 | 49.1% | 5,241,223 | 149.1% |
| INVESTMENT INCOME | 33,873,044 | 33,516,949 | (356,095) | -1.1% | 33,873,044 | 98.9% |
| **TOTAL REVENUE & INCOME** | **$ 564,477,574** | **$ 573,926,323** | **$ 9,448,749** | **1.7%** | **$ 564,477,574** | **101.7%** |

Through June 2008, total revenue was $573.9 million, $9.4 million or 1.7% more than budgeted. Total expenses were $564.1 million, $.4 million or 0.1% less than budgeted.

Expenses –

- **Direct Expenses** totaled $202.4 million, $4.2 million or 2.0% less than budgeted.
- **Wages and Salaries** are $1.6 million or 1.9% less than budgeted as a result of lower regular pay due to fewer than budgeted filled positions.
- **Professional Services** are $1.2 million or 15.2% less than budgeted mainly due to underspending for security in Emergency Preparedness of ($329,000) and lab and testing analysis in ENQUAD of ($503,000).
- **Other Services** are $801,000 or 3.5% less than budgeted mainly due to underspending for sludge pelletization of $696,000 due to lower quantities, $125,000 is for space lease/rentals, and $61,000 is for grit and screenings, related to lower quantities.
- **Energy and Utilities** are $558,000 or 2.1% lower than budgeted mostly due to lower diesel fuel purchases, lower water and natural gas usage, offset by higher electricity.
- **Maintenance** is $640,000 or 2.5% more than budgeted. Overspending in Support $929,000 due to timing of inventory receipt and disbursement offset by underspending in Operations of $72,000 mostly due to timing and Emergency Preparedness of $241,000 due to lower spending for special equipment materials and services.
- **Other Materials** are $405,000 or 8.1% more than budget mainly due to Vehicle Expense of $129,000 due to higher gasoline pricing; Lab and Testing Supplies of $174,000, and Other Materials of $112,000.
- **Indirect Expenses** are $1.7 million or 3.7% more than budget mainly for Operating Reserves of $1.2 million due to decision to exclude Other Post Employment Benefits from Operating Reserve criteria and lower Insurance payments/claims of $252,000.
- **Debt Service** totaled $318.9 million, $5.5 million or 1.8% more than budgeted mainly as a result of unfavorable variable rate impact of $6.9 million.

Revenue and Income –

- **Other User Charges** and **Other Revenue** totaled $22.6 million combined; the majority of the $9.8 million variance is for Reading entrance fee ($7.8 million) which was not budgeted, higher than budgeted receipt for the Renewable Portfolio Standard (RPS) credits for the Deer Island energy program, miscellaneous revenue relating to NStar Rebate Energy Efficiency Program.
- **Investment Income** through June totaled $33.5 million, $356,000 or 1.1% less than budgeted partly due to higher fund balances $1.8 million offset by lower interest rate of ($2.2) million.

# Cost of Debt
June 2008

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

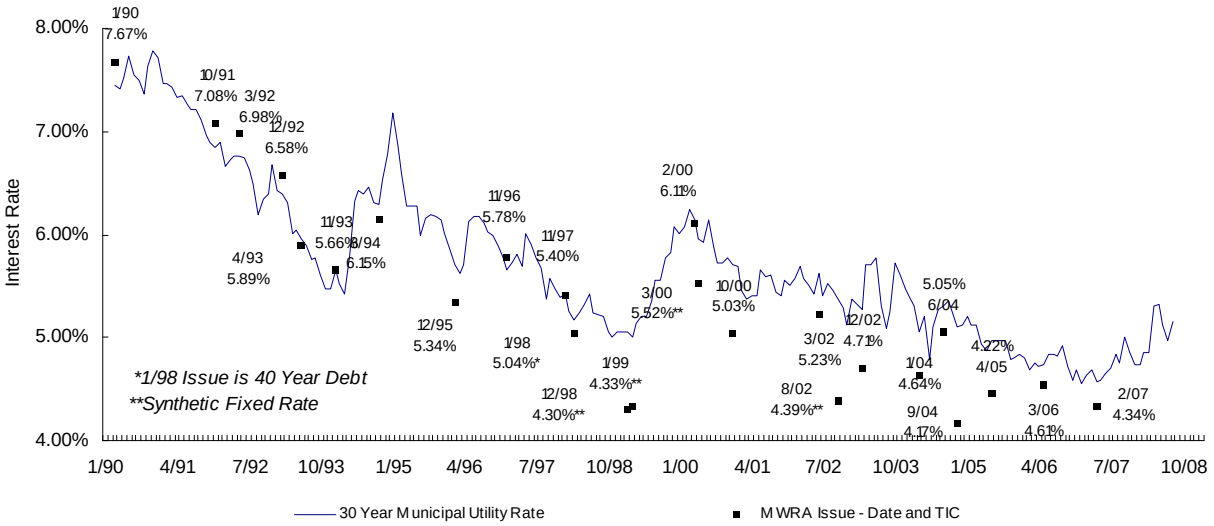
**Average Cost of MWRA Debt**

| | |
|---|---|
| Fixed Debt ($3,892) | 4.67% |
| Variable Debt ($579) | 3.91% |
| SRF Debt ($997) | 0.92% |
| Weighted Average Debt Cost ($5,468) | 3.90% |

**Most Recent Senior Fixed Debt Issue**
**February 2007**

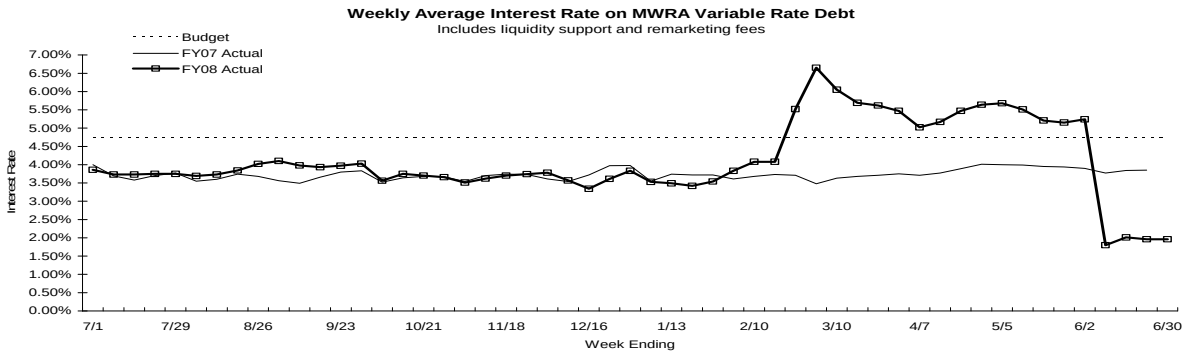
| | |
|---|---|
| 2007 Series A & B ($848) | 4.34% |

**MWRA Fixed Rate Debt vs. 30 Year Municipal Utility Interest Rate**




**Weekly Average Interest Rates vs. Budget**

MWRA currently has seven variable rate debt issues with $579 million outstanding, excluding commercial paper and the five floating rate issues 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. Short term rates had been relatively constant during the first half of fiscal year 2008, but market conditions changed in January due to bond insurer credit downgrades. This resulted in higher rates from January through May. In May MWRA refunded the insured bonds with uninsured bonds which resulted in lower interest rates. 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
June 2008

Actual interest income varies from budgeted amounts because either fund balances or interest rates are greater or lower than budgeted.

**YTD Investment Income vs Budget**
**($000)**

| | Impact on Investment Income due to Variance in Fund Balances | | | | Impact on Investment Income due to Variance in Interest Rates | | | Combined Impact on Investment Income | |
|---|---|---|---|---|---|---|---|---|---|
| Fund | Average Budgeted Balance | Average Actual Balance | Variance | Impact | Budget | Actual | Impact | Impact | % |
| Combined Reserves | $89,297 | $89,983 | $686 | $21 | 4.98% | 5.05% | $70 | 90 | 2.03% |
| Construction | $101,004 | $96,299 | ($4,705) | ($212) | 4.50% | 4.32% | ($172) | -384 | -8.44% |
| Debt Service | $109,048 | $118,885 | $9,837 | $443 | 4.50% | 4.16% | ($405) | 38 | 0.78% |
| Debt Service Reserves | $272,290 | $271,438 | ($851) | ($24) | 5.09% | 4.61% | ($1,317) | -1,341 | -9.68% |
| Operating | $55,650 | $51,668 | ($3,982) | ($178) | 4.44% | 4.09% | ($183) | -361 | -14.59% |
| Revenue | $44,688 | $83,872 | $39,184 | $1,763 | 4.55% | 4.30% | ($190) | 1,573 | 77.46% |
| Redemption | $35,410 | $35,410 | $0 | $3 | 4.54% | 4.62% | $24 | 27 | 1.69% |
| Total | $707,385 | $747,555 | $40,170 | $1,817 | 4.79% | 4.48% | ($2,173) | -356 | -1.1% |

**YTD Investment Income Variance**