

MASSACHUSETTS WATER RESOURCES AUTHORITY

# Board of Directors Report

on

## Key Indicators of MWRA Performance

for

Second Quarter FY2009

Q1	Q2	Q3	Q4



Frederick A. Laskey, Executive Director  
Michael J. Hornbrook, Chief Operating Officer  
February 11, 2009

# Board of Directors Report on Key Indicators of MWRA Performance for Second Quarter FY2009

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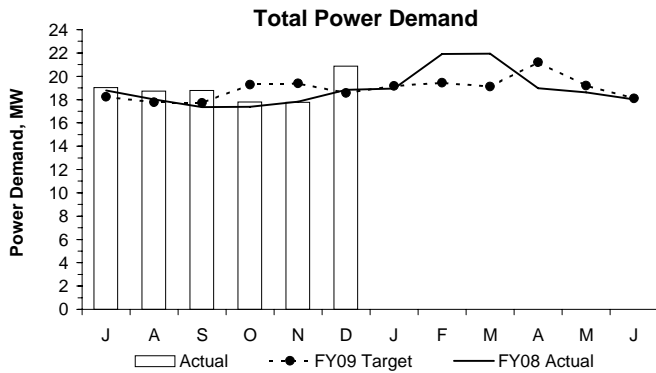
This quarterly report is prepared by MWRA staff to track a variety of MWRA performance measures for routine review by MWRA's board of directors. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for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

Frederick A. Laskey, Executive Director  
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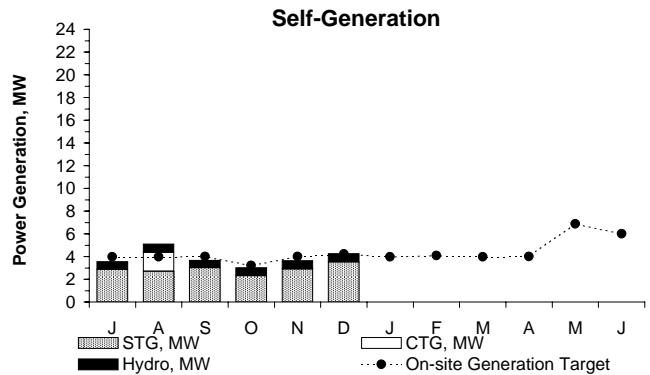
# OPERATIONS AND MAINTENANCE

# Deer Island Operations

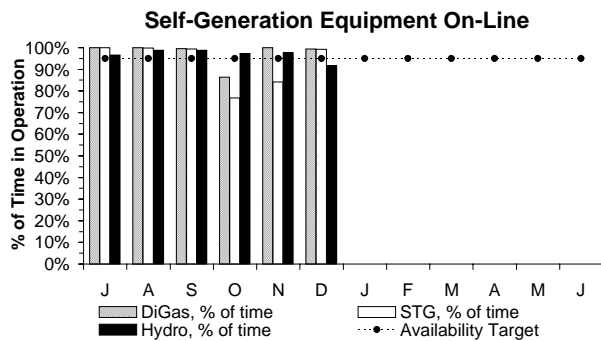
## 2nd Quarter - FY09



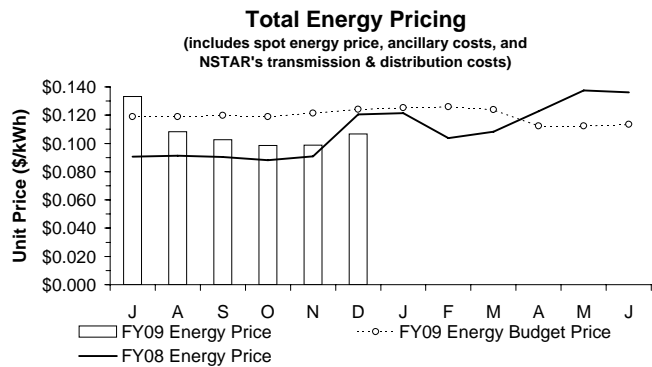
Overall, Total Power Demand for the 2nd Quarter was very close to projections (-1%) and was slightly higher than the FY08 actual (+4%) for the same period due to higher plant flow. Total Power Demand was below target in October and November but above target in December.



Overall, power generated on-site was 4.5% below the target for the 2nd Quarter. Power generation by the STG was 2% below target due to scheduled annual maintenance in October and November. The hydro turbines exceeded their target (+7%) during the quarter. The CTGs were only run briefly for a total of 0.8 hours in October for maintenance/checkout purposes and intermittently on November 17-18 (2.7 hours total) as a precautionary measure against a sudden loss of power during NSTAR's scheduled maintenance.

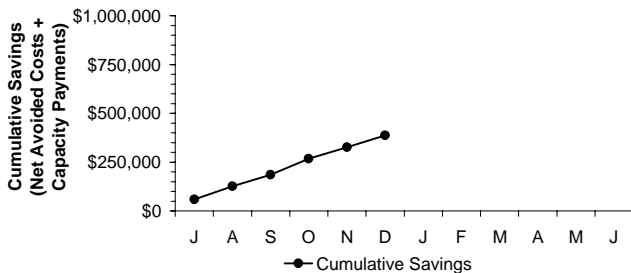


The DiGas and the Hydro Turbine systems met the 95% availability target for the 2nd Quarter; the STG system was at 87% availability due to scheduled annual boiler and STG systems maintenance in October and November.



Under the current energy supply contract, all of DI's energy is purchased in real time. The total energy price in the 2nd Quarter was 17% lower than the target due to lower-than-budgeted spot energy prices. The total energy price includes spot energy price, transmission & distribution charges, and ancillary charges. Please note the December total energy price is an estimate as the invoice has not been received.

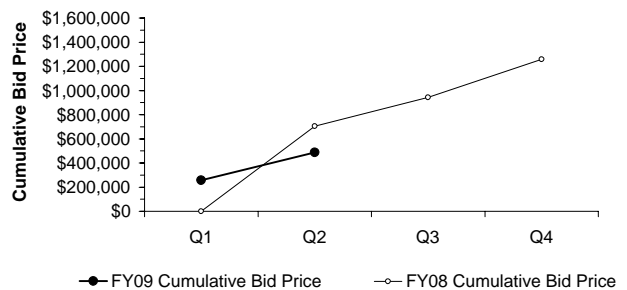
### Load Response Program



DI did not participate in any demand response events during the 2nd Quarter as none were called.

Deer Island 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 Deer Island'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, MWRA 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 monthly Capacity Payments - \$386,859 through the 2nd Quarter of FY09.

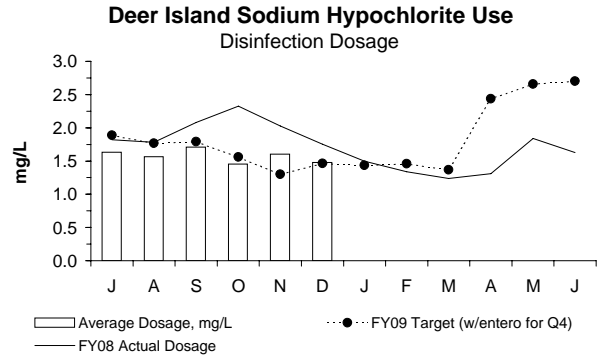
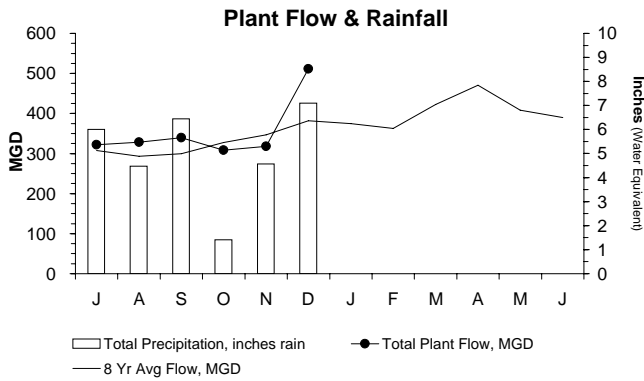
### MA Renewable Portfolio Standard



In December, MWRA sold 6,595 Renewable Energy Credits for a total value of \$230,825. Prices reflect the bid prices on the date that bids are accepted. The cumulative bid price reflects the total value of bids received to date in FY09, \$487,125. No bids were received in October or November.

# Deer Island Operations

## 2nd Quarter - FY09



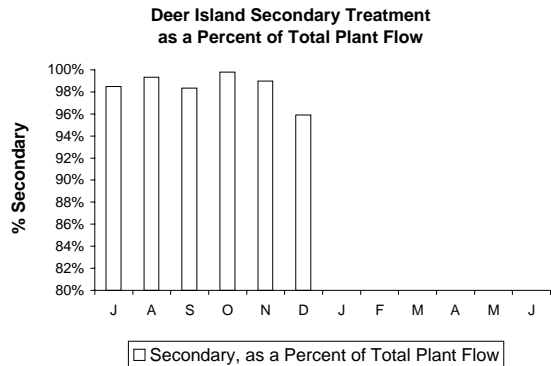
Overall, Total Plant Flow for the 2nd Quarter was 8% higher than the 8-year average flow (379.2 mgd vs. 352.0 mgd) as precipitation was 18% higher than the 8-yr average for the quarter (13.08 inches actual vs. 11.2 inches expected). While the Total Plant Flow was slightly lower than expected in October and in November, December's precipitation was more than double the target resulting in Total Plant Flow being 34% greater than expected that month.

The disinfection dosing rate was on target (+5%) for the 2nd Quarter and 26% lower than the FY08 actual dosage for the same period. (Total Plant Flow was significantly lower than expected during the 2nd Quarter of FY08 in comparison to FY09, resulting in a more concentrated wastewater in FY08 and thus the higher disinfection dosage in FY08 than in FY09.)

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	5	5	0	98.5%	21.0
A	2	2	0	99.3%	8.64
S	4	4	0	98.3%	28.12
O	1	1	0	99.8%	3.00
N	3	3	0	99.0%	16.32
D	6	6	0	95.9%	80.07
J	0	0	0		
F	0	0	0		
M	0	0	0		
A	0	0	0		
M	0	0	0		
J	0	0	0		
<b>Total</b>	<b>21</b>	<b>21</b>	<b>0</b>	<b>98.5%</b>	<b>157.1</b>



There were a number of significant rain events during the 2nd Quarter, which resulted in 10 separate blending events totaling 99.4 hours of blending and 764.5 million gallons of flow blended with secondary effluent. All secondary blending events that occurred during the quarter were due to rain (or rain in combination with heavy snow melt) resulting in high plant flows. **Secondary permit limits were met at all times in the 2nd Quarter.**

Overall, 98.2% of the total plant flow to DITP was treated through secondary treatment during the 2nd Quarter. The Maximum Secondary Capacity for the entire quarter was 700 mgd.

## Deer Island Operations & Maintenance Report

### Environmental/Pumping:

The plant achieved a maximum average hourly flow rate for the quarter of 1,031 mgd on December 12, 2008 as a result of a major storm event that began on December 9, which produced a total of 3.89 inches of precipitation, mostly rain. Pumping and treatment operations continued without incident through this storm event, as well as throughout the entire quarter.

### Disinfection:

The internal lining to sodium hypochlorite storage Tank 4 was replaced by contractors by the end of the 1st Quarter of FY09. The liner leak tests and inspections were completed and the tank turned over to DITP during the 2nd Quarter of FY09 in October. The internal lining replacement in this tank completes the relining for all four (4) sodium hypochlorite tanks.

### Residuals:

Module 2 Waste Gas Flare was off-line in November and December to allow the unit and its associated systems to be thoroughly inspected, cleaned, calibrated, and repaired. Staff anticipate the project to be completed and tested by the end of January 2009.

## Deer Island Operations

2nd Quarter - FY09

### Deer Island Operations & Maintenance Report (continued)

#### **Odor Control:**

The activated carbon media in five carbon adsorber units was changed out in November and December as part of routine maintenance.

#### **Energy:**

A scheduled annual maintenance on the steam turbine generator (STG) system and the two boilers in the On-Site/Thermal Power Plant required the STG to be off-line from mid-day on October 26 through November 5.

The Board approved a Design/Build contract in October to Lumus Construction, Inc. for two 600-kW wind turbine generators. The two wind turbines will be delivered by barge. All of the power generated from the turbines will be used on-site to offset Deer Island's electricity purchases.

Phase 2 of a multi-phase project to reduce electricity usage for lighting on Deer Island was completed in December. Phase 2 work included the replacement of existing lamps and ballasts with high performance fluorescent technologies, reduced-wattage fixtures, integrated day-lighting and occupancy controls, and replacement of existing "Exit" signs with LED Exit signs.

### Clinton Wastewater Treatment Plant

#### **Soda Ash System Replacement:**

Project is complete; the system has been operating satisfactorily with very few exceptions.

#### **Operations and Maintenance:**

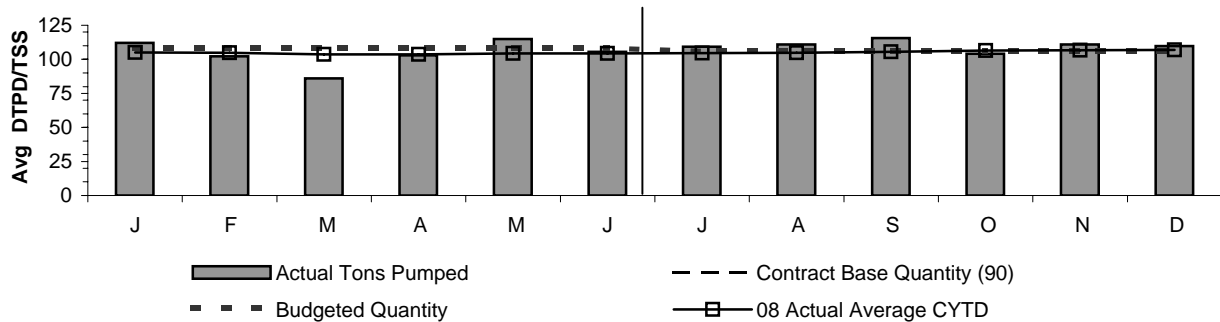
*Headworks Building* - Plumbers replaced backflow preventer valves that were not operating properly and installed a new condensate tank and pumps for the new boiler. *Chemical Building* - Staff installed a new electronic control card and weatherproof enclosure on the soda ash filter system. This controls the air pressure in the filter bag compartment to prevent the filters from getting clogged. Staff also installed a new condensate tank and recirculation pumps on the hot water line. *Digester Building* - Staff fabricated a new motor mount base for the Sludge Recirculating Pump 3 and re-installed the mount and pump.

## Deer Island Residuals

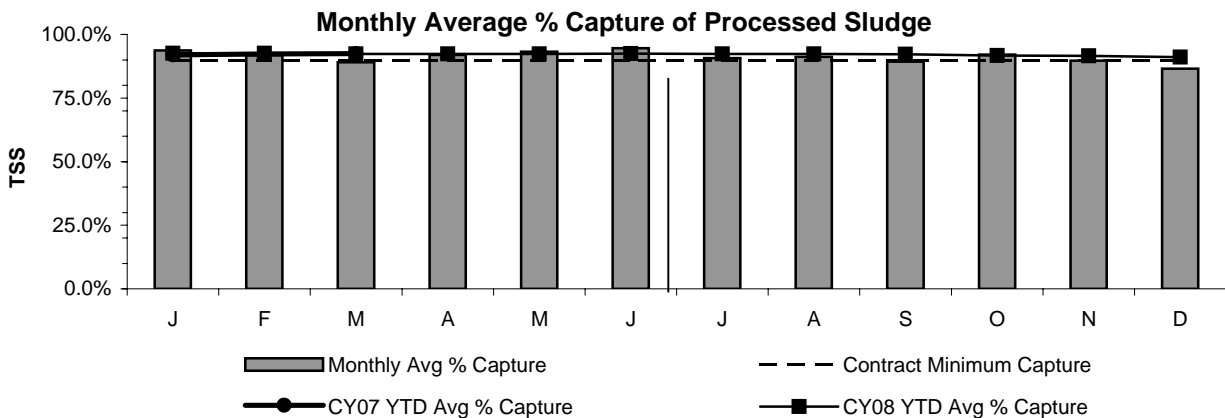
2nd Quarter - FY09

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 (FY09's budget was 106 DTPD/TSS).

### Sludge Pumped From Deer Island



The average total quantity of pumped sludge for the 2nd Quarter was 108 DTPD, which was in line with the FY09's budget of 106 DTPD. 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.



NEFCO did not meet the contract requirements for the daily average percentage capture of solids. The average solids capture for the 2nd Quarter was 89.4%; the contract requirement is at least 90%. Operation of the by-pass system due to the October duct fire and the inconsistent operation of the new automatic sampler contributed to the lower number. The sampler was repaired on December 30, 2008 and appears to be working correctly. Staff anticipate that NEFCO will meet the contract requirements going forward.

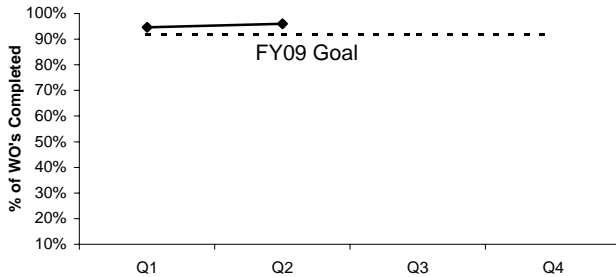
# Deer Island Maintenance

2nd Quarter - FY09

## Productivity Initiatives

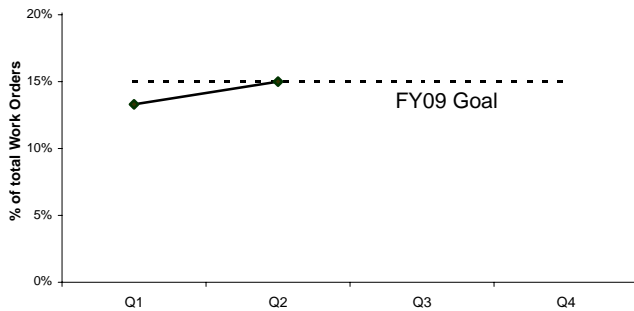
Productivity initiatives include increasing predictive maintenance tasks. Accomplishing this initiative should result in a decrease in the overall maintenance backlog.

### Predictive Maintenance Compliance



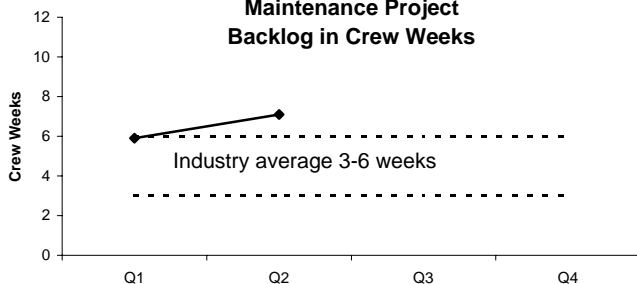
Deer Island's FY09 predictive maintenance goal is completion of 92% of all PdM work orders; DI completed 96% this quarter.

### Predictive Maintenance



Deer Island's FY09 goal is to increase PdM work orders to 15% of total work orders; DI reached that goal (15%) in the 2nd Quarter.

### Maintenance Project Backlog in Crew Weeks

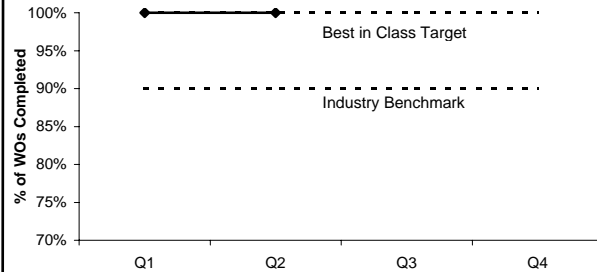


The industry average for maintenance backlog is 3-6 weeks. Deer Island's FY09 goal is to stay within the industry average. Maintenance backlog was at 7.1 weeks for this quarter. DI has one Piping Specialist vacancy and overtime is being limited to critical equipment repairs only.

## Proactive Initiatives

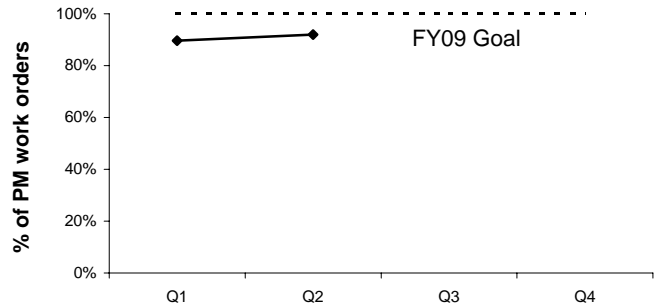
Proactive initiatives include completing 100% of all preventive maintenance tasks and increasing preventive maintenance kitting. These tasks should result in lower maintenance costs.

### Preventive Maintenance Compliance



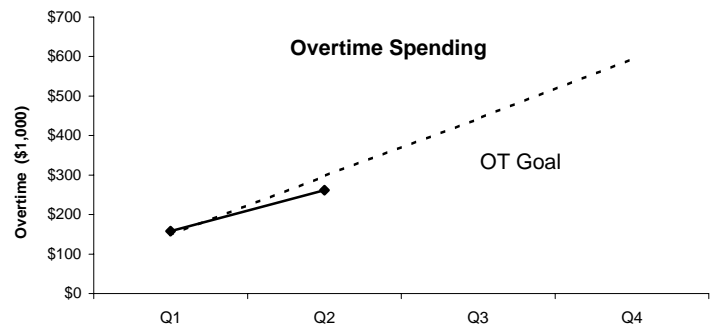
Deer Island's FY09 preventive maintenance goal is completion of 100% of all PM work orders from Operations and Maintenance. DITP completed 100% of all PMs in the 2nd Quarter.

### Preventive Maintenance Kitting



Deer Island's FY09 preventive maintenance kitting goal is 100% of all PM work orders. Steady progress has been made. DI kitted 92% of all PM work orders in the 2nd Quarter.

### Overtime Spending



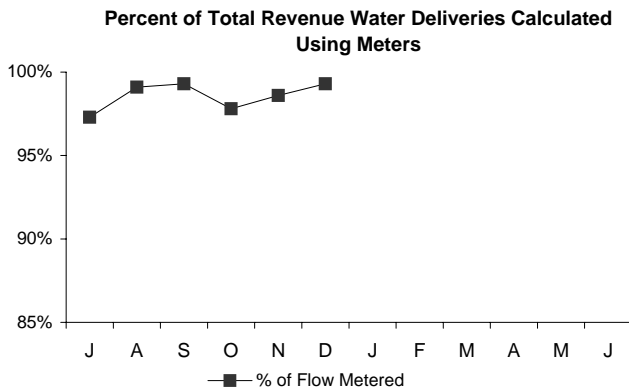
Overtime was under budget by \$41K for this quarter. This quarter's overtime was spent on storm coverage and by supporting NSTAR by switching substations, and clarifier work. Management's efforts to control overtime is on-going; only repairs to critical equipment is allowed on overtime.



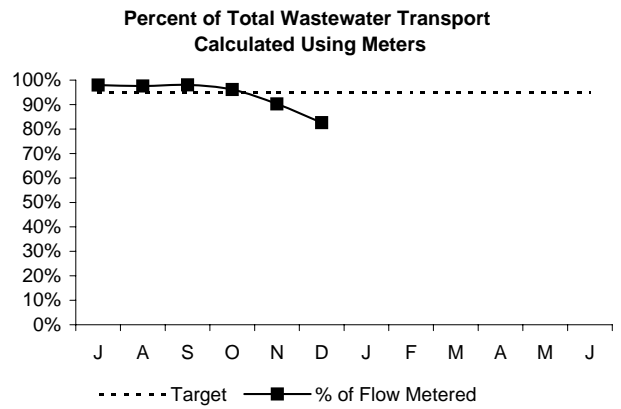
# Operations Division Metering

## 2nd Quarter - FY09

### WATER METERS



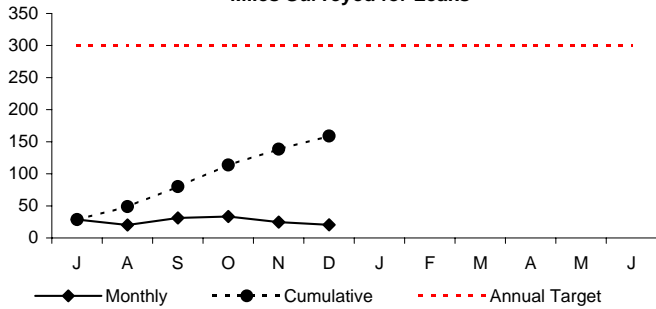
### WASTEWATER METERS



The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During the second quarter, meter actuals accounted for 98.6% of flow; only 1.4% of total revenue water deliveries were estimated. The following is the breakdown of estimations:  
 In-house and Capital Construction Projects - 1.1%  
 Instrumentation Failure - 0.3%

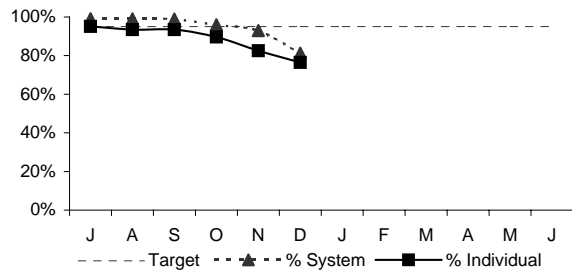
The target for revenue wastewater transport calculated using meters is 95%. Estimates are generated for meters missing data due to instrument failure and/or erratic meter behavior. Estimates are produced using data from previous time periods under similar flow conditions. During the 2nd Quarter, on average, 10.33% of the total flow was estimated. Access to many of the meter sites for maintenance is being impacted by the ongoing construction zone safety issues and the use of flaggers.

### Miles Surveyed for Leaks



During the second quarter 78.72 miles of water mains were inspected; this brings the total for the fiscal year to 158.91 miles.

### % METER UPTIME



For the second quarter, out of a possible 1,616,256 data points, 161,351 points were missed resulting in a system-wide up time of 90.02%. Of the 183 revenue meters installed, on average 31 experienced down time greater than the 5% target resulting in a 83.1% individual meter uptime. For the second quarter, down time for an individual meter is defined by any individual meter having less than 2,797 data points.

#### Water Distribution System

Month	J	A	S	O	N	D	J	F	M	A	M	J
Leaks Detected	1	0	0	2	1	1						
Leaks Repaired	1	0	0	2	1	1						
Backlog	0	0	0	0	0	0						
Avg. Lag Time	4.0	4.0	4.0	3.0	2.5	2.0						

The leak backlog for FY09 remains at zero. Pipeline staff found and repaired four leaks in the 2nd Quarter. The Pipeline Program's goal is to repair all leaks found during the fiscal year. However, if the goal cannot be reached due to restrictions, isolations, communities, or degree of difficulty, then the goal is to have not more than two leaks outstanding at year's end.

# Water Distribution System Valves

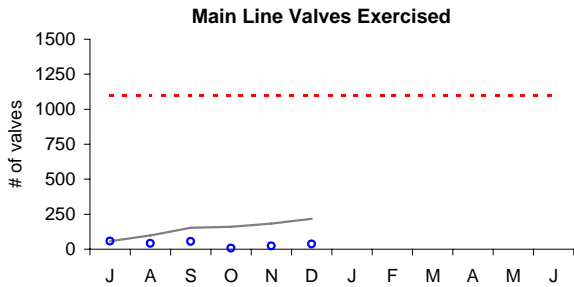
## 2nd Quarter - FY09

### Background

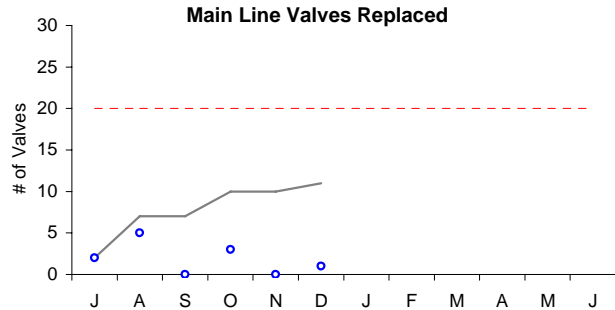
Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but 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. Starting in October 2008, Field Operations' maintenance work has been impacted by construction zone safety issues and the use of flaggers.

Type of Valve	Inventory #	Operable Percentage	
		FY09 to Date	FY09 Targets
Main Line Valves	1,283	85.4%	87%
Blow-Off Valves	1,161	90.7%	94%
Air Release Valves	1,330	92.2%	92%
Control Valves	48	94.0%	92%

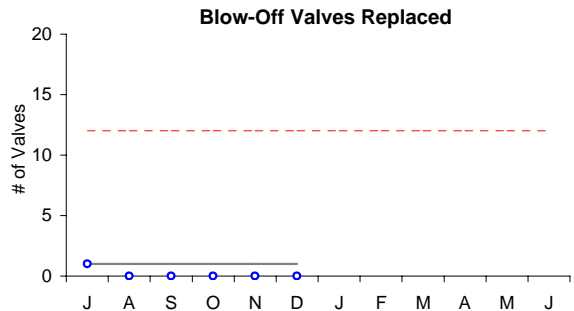
Key to Symbols: ○ FY2009 Monthly Total  
— FY2009 Cumulative Total



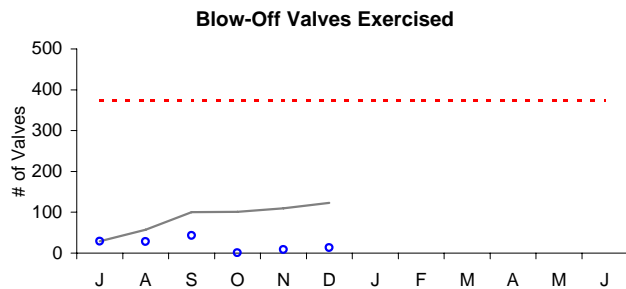
Staff exercised 65 main line in the 2nd Quarter, bringing the total for the fiscal year to 218.



Staff replaced four main line valves this quarter, which brings the total for the fiscal year to 11.



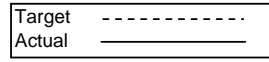
No blow-off valves were replaced this quarter, primarily due to weather-related impacts – snow storms hamper staff's ability to replace blow-off valves. Construction work zone safety/flagger issues and current staffing levels have also affected the blow-off valve replacement schedule for FY09. Staff expect to accelerate blow-off valve replacements in the spring.



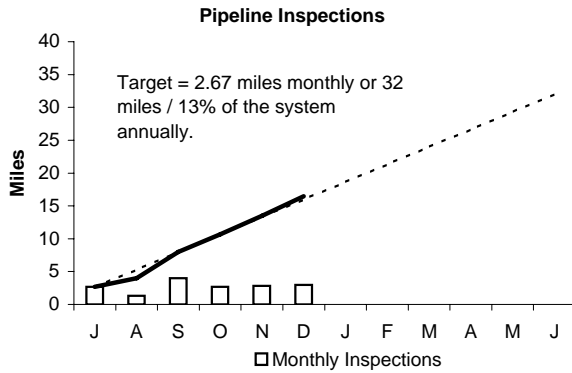
In the 2nd Quarter, staff exercised 23 blow-off valves bringing the total for the fiscal year to 123.

# Wastewater Pipeline and Structure Inspections and Maintenance

## 2nd Quarter - FY09

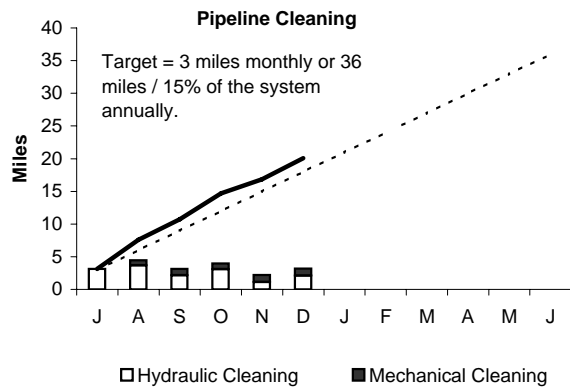


### Inspections



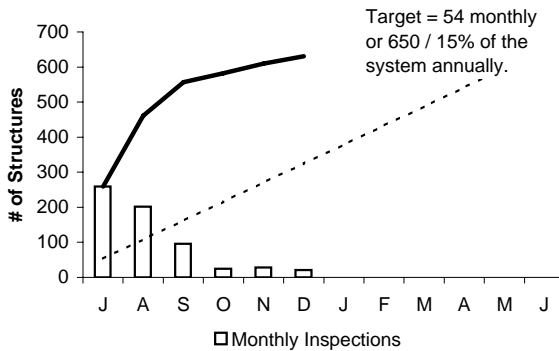
Staff internally inspected 8.45 miles of MWRA sewer pipeline in the 2nd Quarter. Community assistance was provided this quarter to the Town of Westwood as MWRA staff inspected 0.54 miles of Westwood's sewer pipeline.

### Maintenance



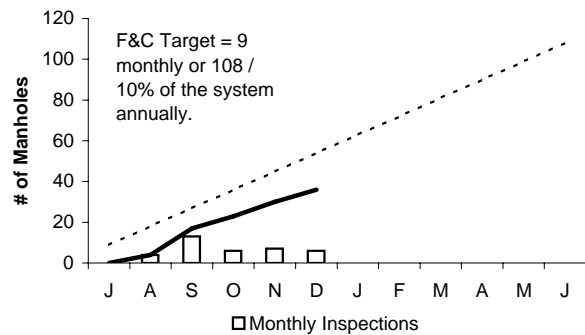
Staff cleaned 9.35 miles of MWRA's sewer system and removed 57.5 cubic yards of grit and debris. No community assistance was requested during the 2nd Quarter.

### Structure Inspections



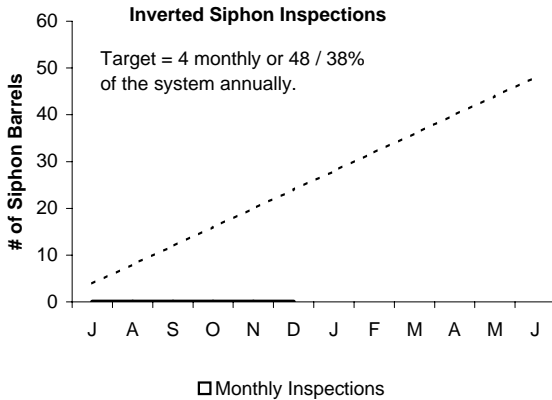
During the 2nd Quarter, staff performed 36 CSO structure inspections and also inspected an additional 38 manholes/structures. The total inspections performed to date in FY09 is 631.

### Manhole Rehabilitation



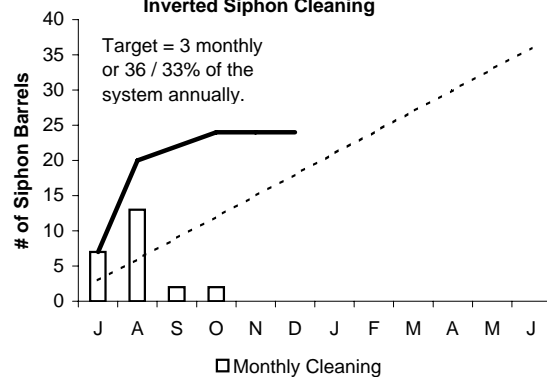
Staff replaced 19 frames and covers this quarter bringing the total for the fiscal year to 36; no manholes were rehabilitated this quarter.

### Inverted Siphon Inspections



No siphon barrels were inspected this quarter; staff are currently in the process of procuring a new sonar camera system to replace an existing unit that is no longer functional and is not cost-effective to repair.

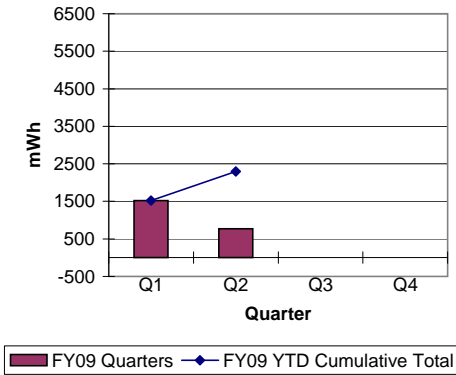
### Inverted Siphon Cleaning



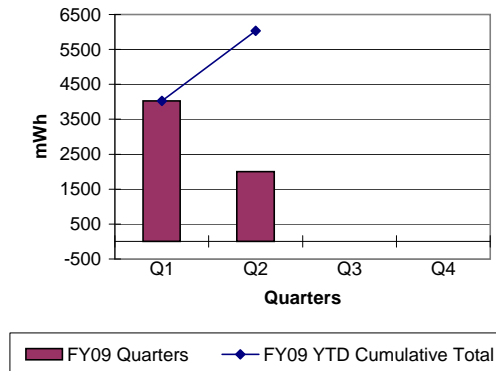
During the 2nd Quarter, staff cleaned two siphon barrels. The total number of siphon barrels cleaned to date in FY09 is 24.

## Field Operations Energy 2nd Quarter FY09

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



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



In the 2nd Quarter, the Cosgrove Hydroelectric Station generated a net of 772 mWh; revenue for the quarter was \$41,218 and year-to-date revenue is 145,816. Generation was up compared to the same quarter last year because on-going construction work last year impacted station operation. Staff continued the practice that began last year of operating the station at reduced flow during the winter months when the Carroll Treatment Plant is operating at half-plant capacity for maintenance work, rather than shutting it down completely.

In the 2nd Quarter, Oakdale Station's hydroelectric plant generated 2,005 mWh, which produced \$201,638 in revenue for the quarter. Year-to-date revenue is \$599,832. Generation in the 2nd Quarter was 44% lower compared to the same quarter in FY08. Fall and early winter of 2008 was much wetter than in 2007. Therefore, less water was transferred from the Quabbin Reservoir to the Wachusett Reservoir. (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 Highlights:

**Wind Power:** Staff continue to explore the siting of a wind turbine at Nut Island. Installation of wind turbines is also being explored for the Carroll Water Treatment Plant (CWTP), DeLauri Pump Station, and the Norumbega Covered Storage Facility. A 12-month evaluation at Southborough found wind velocities to be too low to viably support a wind turbine at that facility.

**Loring Road Hydroelectric Generation Feasibility Study:** Preliminary design work continued into the 2nd Quarter. The facility would generate approximately 1.2 million kWh annually.

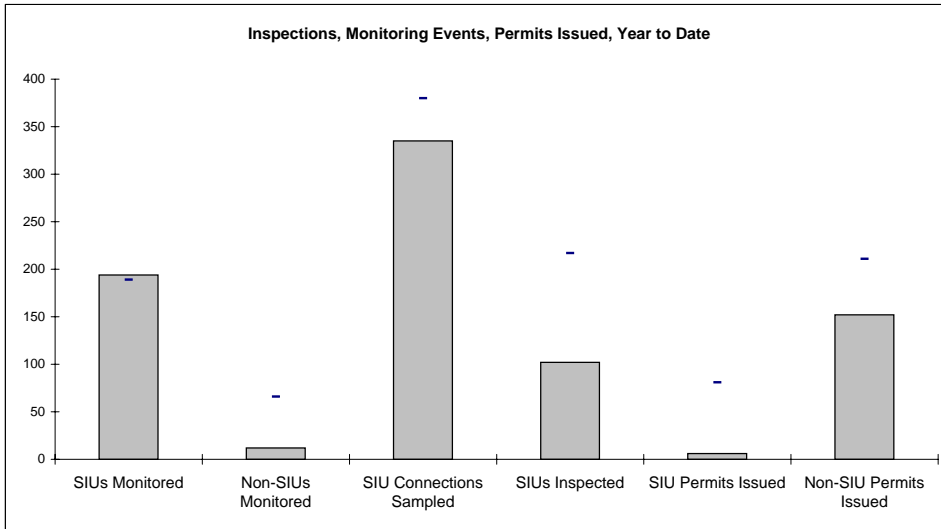
**Wachusett Dam Hydroelectric Generation Study:** Staff submitted a grant application for design and construction under MTC's Small Hydropower Initiatives Program during the first quarter of FY09; MTC awarded MWRA a \$375,000 grant in January 2009.

**CWTP Energy Audit:** National Grid (NGRID) and its contractor conducted an energy audit of the CWTP in FY08. The first phase of the audit was covered lighting only and NGRID's contractor recommended changing out the high pressure sodium lights for more energy-efficient lighting and installing occupancy and daylight sensors, as appropriate. (The work began in January 2009 and will be completed by March 2009.) MWRA will save approximately 450,000 kWh and approximately \$56,000 annually as a result of this work.

**Chelsea Facility Energy Audit:** NSTAR conducted an energy audit of the Chelsea Facility. Phase 1 of the audit, installing energy-efficient lighting, was completed in December 2008. When the work is completed, it will save MWRA approximately 188,000 kWh and \$30,000 annually. The second phase of the audit, a study of the HVAC system will begin in February 2009 and take approximately three months to complete. Staff will work with NSTAR and its contractor after these recommendations are received to determine which recommendations to implement. 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

2nd Quarter - FY09



EPA Required SIU Monitoring Events for FY09: 189  
YTD : **194**

Required Non-SIU Monitoring Events for FY09: 66  
YTD : **12**

SIU Connections to be Sampled For FY09: 380  
YTD: **335**

EPA Required SIU Inspections for FY09: 217  
YTD: **102**

SIU Permits due to Expire In FY09: 81  
YTD: **6**

Non-SIU Permits due to Expire for FY09: 211  
YTD: **152**

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. 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.

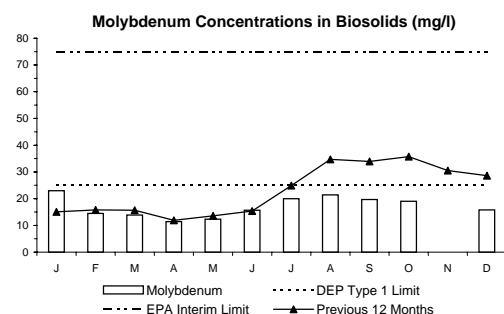
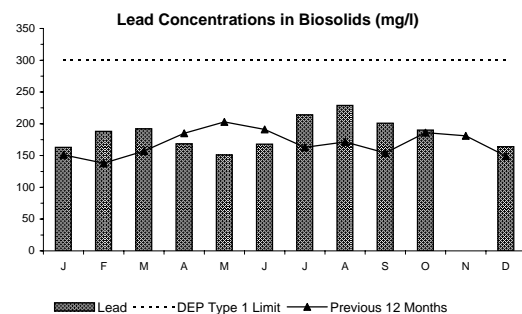
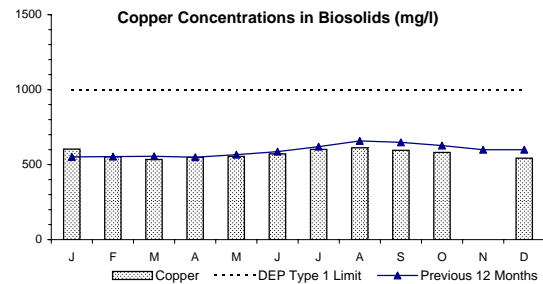
SIU and Non-SIU permits are issued with durations of two to five years, depending on the category of industry, varying the number of permits that expire in a given year.

	Number of Days to Issue a Permit						Total Permits Issued	
	0 to 120		121 to 180		181 or more		SIU	Non-SIU
Jul	0	8	0	1	0	0	0	12
Aug	2	90	1	4	0	6	3	100
Sep	0	6	1	1	0	1	1	8
Oct	1	7	0	2	0	0	1	9
Nov	1	9	0	1	0	0	1	10
Dec	0	9	0	4	0	0	0	13
Jan							0	0
Feb							0	0
Mar							0	0
Apr							0	0
May							0	0
Jun							0	0
% YTD		85%		9%		5%	6	152

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.

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.

**Note: Because of the fire at the Pelletizing Plant, no metals data is included in the three graphs to the right for the month of November.**



## Field Operations Highlights 2nd Quarter – FY09

### Western Water Operations & Maintenance

- Carroll Water Treatment Plant (CWTP): The CWTP was transitioned to half-plant operation. Staff completed a variety of maintenance tasks associated with the maintenance availability period for Treatment Train A. Staff cleaned the primary contactors, the extended contactors, and the A-Side Storage Tank. Other half-plant maintenance tasks included contactor door maintenance, ozone diffuser stone replacement, replacing the actuator on the 72-inch butterfly valve, replacing the rupture disks, inspection of chemical diffusers and mud valve, modifications to the ammonia header and bubble testing the ozone diffuser stones. Towards the end of the quarter, the ozone contactors and the storage tank on the A-side were filled and disinfected. Once clean sample results were received, Treatment Train A was placed back into service. The elevation of the Weston Reservoir was lowered to allow room to flush the upper portion of the Hultman Aqueduct. It was placed into service and the MetroWest Tunnel, from Shaft D to Shaft E, was isolated along with Treatment Train B in preparation for half-plant maintenance of the B-side. Also, the Department of Environmental Protection conducted its annual inspection of the CWTP at the beginning of the quarter; no deficiencies were noted.
- Severe Weather Event: The state experienced a significant ice storm at the end of the quarter and Worcester County was hit especially hard. Staff worked at clearing and chipping downed trees along the Rutland-Holden Easement and at the Quabbin Aqueduct facilities. This work will continue into the next quarter.
- Wachusett Aqueduct: Staff completed a trial removal of one of the overflow structure covers on the Wachusett Aqueduct Extension. Staff also installed a split rail fence and gate along the Open Channel on Northborough Road at the request of the Southborough Fire Department.

### Metro Water Operations & Maintenance

- Brattle Court Pump Station Acceptance Test: Phase 1 of the construction work at the Brattle Court Pump Station (Pumps 1 and 3) went through the 21-day acceptance test; the pumps ran with no service impacts and were kept in service at the end of the testing period.
- Section 22 Isolation: Section 22, Southern High Service, was isolated on December 30 to set the line stops for the Southern Spine CIP construction contract; the isolation was successful with no impacts. The line was back in service earlier than anticipated. Another isolation will be required once the contractor completes the installation of a new motor-operated butterfly valve that will eventually be used to control the water elevation in the new Blue Hills Covered Storage Tanks.
- Shaft 8 Leak Repair Excavation: A leak surfaced on the 48-inch surface pipe at Shaft 8 in Brighton on October 27. Staff activated the pressure reducing valve at Shaft 7B, which provides redundant service to the Low Service System and Shaft 8, and isolated the Shaft 8 surface pipe connection. The water supply transition from Shaft 8 to Shaft 7B occurred without incident.

### Wastewater Operations & Maintenance

- Braintree-Weymouth Pump Station: Staff continue to work with the “Muffin Monster” grinder manufacturer to establish the best options for resolving “binding” issues at high flows.
- Prison Point and Cottage Farm CSOs: A Conceptual Design Report was issued for Prison Point and Cottage Farm by Engineering staff with the purpose of identifying deficiencies and to assist in a Final Conceptual Design Report.

### TRAC

- Penalty Assessment Notices (PANs): On October 10, 2008, TRAC issued a \$77,000 PAN to Forsyth Dental Center in Boston for discharging excessive levels of mercury into MWRA's sewer system. On November 3, 2008, TRAC issued a \$37,100 PAN to Westban Hotel Venture, dba Westin Copley Plaza Hotel for failure to comply with the reporting requirements of its Sewer Use Discharge Permit and a 2007 Administrative Order.
- Settlement Agreement: TRAC and Brigham and Women's Hospital entered into a Settlement Agreement, effective December 12, 2008, to resolve all issues related to a November 6, 2007 PAN. The Settlement Agreement requires the hospital to pay a \$68,320 administrative penalty; implement a compliance schedule, which includes the installation of a pre-treatment system to achieve compliance with MWRA's mercury limit; and pay stipulated penalties for a period of two years for any violations that occur during that period.

**Metro Equipment  
and Facility  
Maintenance**

- Braintree-Weymouth Bar Screen: Staff designed and built a manual bar screen using aluminum; the work was performed while keeping the channel available for operations.
- Dam Maintenance: Grounds crews continue their work on dam maintenance activities to protect the integrity of those structures; this is a large and difficult job.

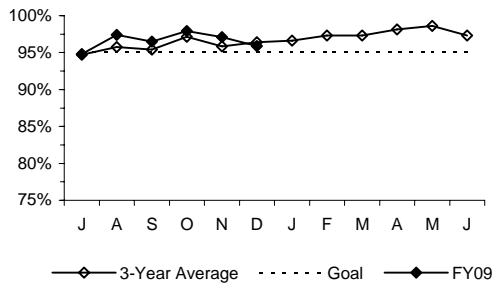
**Operations  
Support**

- Walnut Street Line: Staff developed testing plans for testing the pressure reducing valve (PRV) and Meter 5. In November, the Walnut Street Line was started up in coordination with BWSC. In December, the line was put through a high service for testing; this testing will extend into January.
- Water Pump Station Work: Start-up testing was begun at Brattle Court Pump Station in October and completed successfully in December. Spring Street shutdowns were planned and executed to allow start of construction work in the 3rd Quarter.
- Ward Street and Columbus Park Headworks: Replacement of flow measuring equipment was studied to estimate the related impact on sewer flow-based assessments for BWSC. Further testing of the new headworks flow measurement systems in those locations is planned after SCADA work is completed.
- CWTP Performance: Staff continued assess measures taken as part of last year's expert panel recommendations and also provided support for half-plant operation and related maintenance activities which began in November and will extend into the 3<sup>rd</sup> Quarter. Water quality results and internal tank inspections continue to show improvement from the similar period last year.
- Water Quality Monitoring: Staff installed new "s::can Spectrolyzers" at CWTP as a pilot test of a new on-line organics monitoring technology and are continuing to evaluate performance through seasonal changes in water quality.

# Laboratory Services

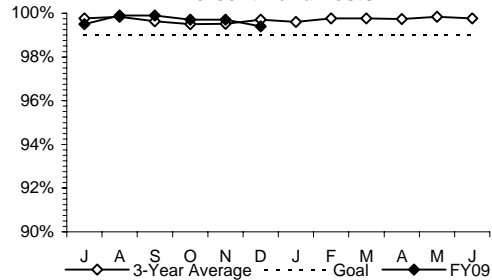
2nd Quarter - FY09

**Percent On-Time Results**



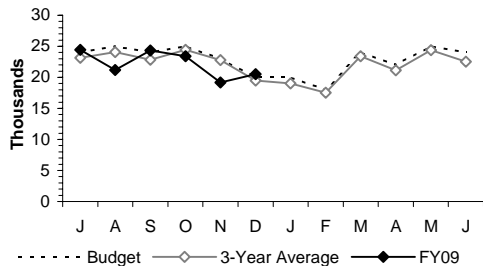
The Percent On-Time measurement was above the 95% goal for all three months of the quarter.

**Percent Valid Tests**



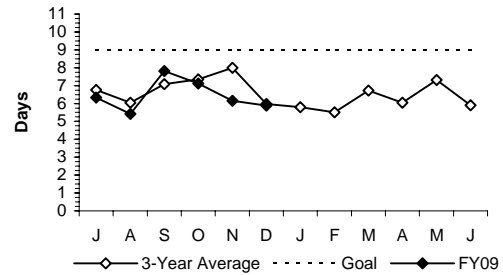
The Percent Valid Tests measurement stayed above the 99% goal for all the three months of the quarter.

**Tests Completed**



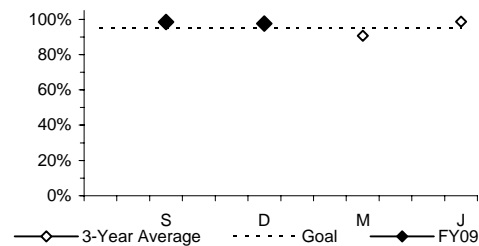
The Tests Completed measurement was below the seasonally-adjusted budget projection for the quarter and is slightly below projections year to date due to fewer-than-normal new projects.

**Turnaround Time**



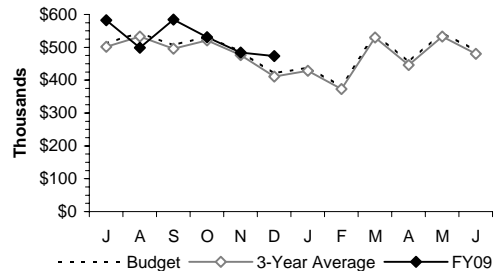
Turnaround Time was faster than the 9-day goal for all three months of the 2nd Quarter.

**Quarterly Compliance Rating**



Audits are performed in September, December, March and June. A quarterly audit of client notification procedures at all five lab locations found good compliance.

**Value of Services Rendered**



Value of Services Rendered was above the seasonally-adjusted budget projection for the quarter and is above projections year to date.

**Highlights:** An AWWARF report on lead service line replacements was published using MWRA data.

**LIMS:** Completed the "Conference Room Pilot" phase of the New LIMS project and nearing completion of preparation for the first phase of "Go-Live" (drinking water bacteria) scheduled for the beginning of February 2009. This includes electronic reporting of drinking water data to DEP. The final phase of "Go-Live" (all chemistry and wastewater microbiology) is scheduled for April 2009.

**Quality Assurance:** DEP audited the Lab for certification on three new analyses (mercury, PCBs in drinking water, and semi-volatile organics in wastewater) and noted few deviations. Submitted comments to DEP on its proposal to eliminate the *E. Coli* confirmation that DLS is currently using in favor of a faster method. The new method would require operational changes that need to be carefully considered.

**Security:** Met with representatives of the State Fire Marshalls office, DPH and MEMA to secure their acceptance of an SOP for the Emergency Services Unit's mobile lab. Reviewed an AWWA document entitled "Guide to Evaluating and Selecting Disinfection in a Security-Conscious Environment".

**DITP:** Tested rush sodium hypochlorite samples from a barge delivery. Arranged for outside testing of solid samples from the Pellet Plant fire. Collected daily fuel delivery truck samples for a week for testing by an outside lab. Tested rush daily samples from sodium hypochlorite delivery trucks. Tested rush chloride sample from Braintree-Weymouth Pump Station to test for saltwater intrusion.

**ENQUAD:** Completed the annual benthic sediment samples from Mass. Bay and Boston Harbor. Preparing a Quality Assurance Project Plan for the fish and shellfish Harbor and Outfall samples that DLS will be taking in-house in 2009.

**FOD/TRAC:** Taking in-house the Fats, Oil, and Grease test.

**FOD/Water Quality Assurance:** Completed semi-annual Lead and Copper Rule samples. Continued CWTP "profiling" using microbiology samples from within the plant. Tested solid residue from the CWTP's half-plant shut-down. CWTP raw water testing to increase from five to seven days a week. Emergency Distribution Reservoir testing to be reduced from six times a year to once a year. Performing *E. Coli* method comparison in anticipation of a change in DEP requirements.

**Outside Customers:** Reported Woburn's annual lead and copper rule results. Tested samples from a rehabilitated Weston water storage tank to help the town bring it back on-line. Tested rush volatile organics samples from Woburn in response to a gasoline spill into Woburn's watershed.

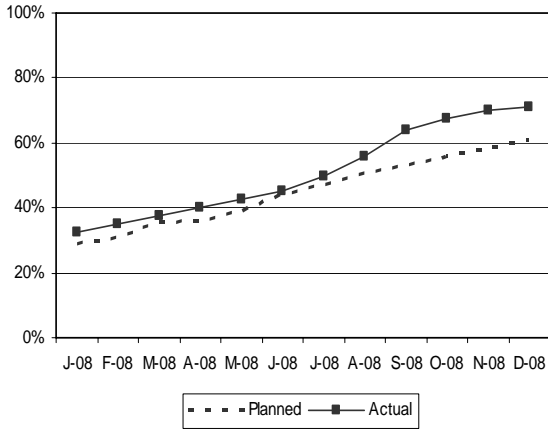


# CONSTRUCTION PROGRAMS

# Projects In Construction - 1 December 2008

(Progress Percentages based on Construction Expenditures)

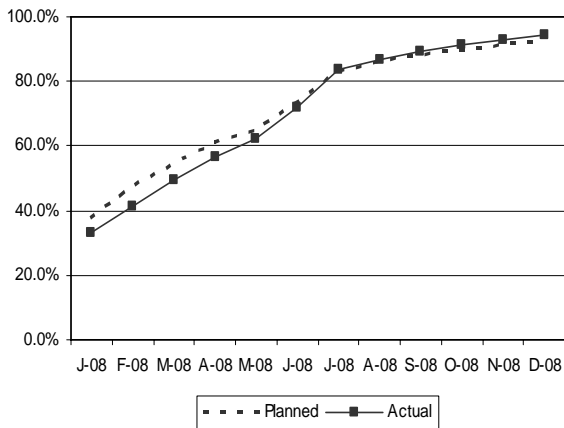
**Blue Hills Covered Storage Design Build Project**  
Progress - December 2008



**Project Summary:** This project includes 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 December, the contractor completed framework, rebar and concrete placement at all walls, perimeter base slab rings and interior base slabs on Tank 1 & 2. The contractor completed 90% installation of precast columns, beams and roof planks and continued placing rebar roof topping slabs on Tank 1 & 2. The contractor continued installing the HVAC system in the valve vault and completed the installation of all concrete, piping, valves platforms and stairs. The contractor continued backfilling at the dam core wall footings. During the summer and fall of 2008, the contractor expedited concrete work due to good weather and moved ahead of schedule on the fabrication and installation of precast columns, beams and planks for the tank roofs.

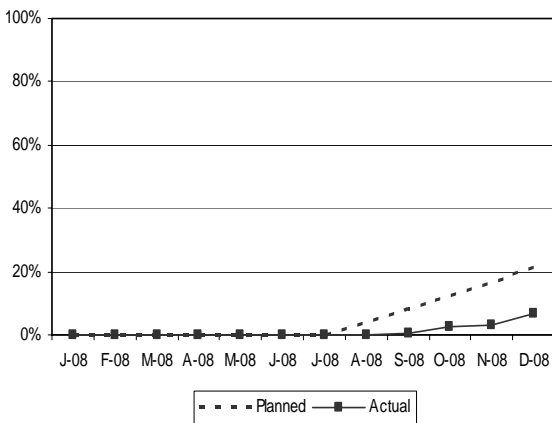
**North Dorchester Bay CSO Tunnel/Shafts**  
Progress - December 2008



**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 December, at the Conley maintenance access structure, the contractor commenced demolition of temporary tunnel concrete cradles & slabs and continued topside cleanup and interim storage of equipment and materials. At CSO-081, -082, & -084, the contractor continued structure interconnections of the power, hydraulic and I&C. At -085 & -087, rework continued on the hydraulic control vault. At -086, work continued on the hydraulic control vault fit-out, and at -087, construction continued on the maintenance access structure.

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



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

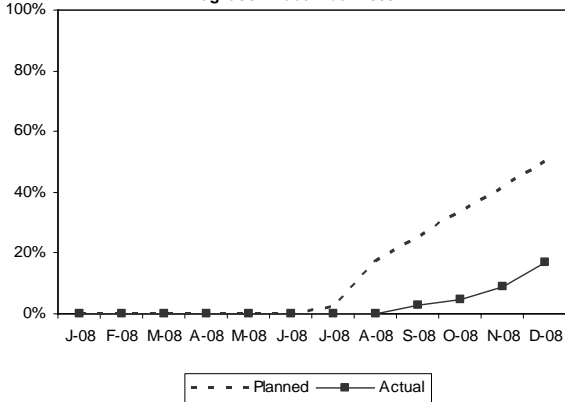
**Status and Issues:** The contractor continued excavation at Jacking Shaft (JS) -4A and -5A and Receiving Shaft (RS) -6A.

Secant pile activity is complete at JS-9A. The contractor completed support of utilities outside the excavation zones at RS-3A and JS-6A. Utility coordination meetings continue with NGRID, NSTAR, MBTA, Verizon, Comcast and BWSC. Work continued on pre-construction condition survey to include deformation monitoring points and utility monitoring points. Pre-construction video records as well as baseline noise recordings continued to be compiled.

## Projects In Construction – 2 December 2008

(Progress Percentages based on Construction Expenditures)

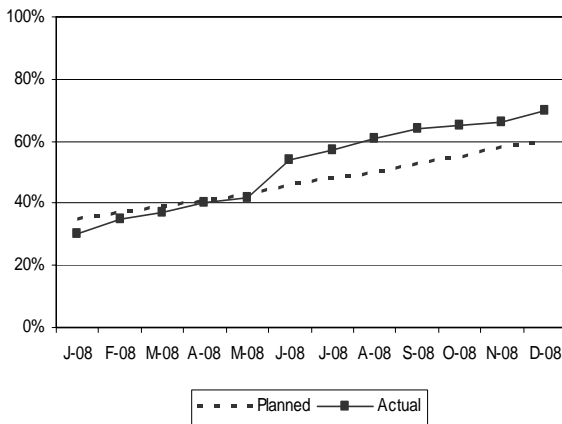
**Cottage Farm/Brookline Connection and Inflow Controls**  
Progress - December 2008



**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:** During December, the contractor installed sheeting to protect existing piping and began excavation for the overflow vault connection pipe. The project is behind schedule for several reasons. The approval process for the dewatering plant submittals and dewatering permits took longer than the contractor expected. Delays continued as the contractor was slow to start excavation, experienced a number of equipment breakdowns and now faces excavation during winter conditions and high groundwater. The construction team believes there is adequate time remaining in the schedule to achieve Milestone 1 in accordance with the court schedule.

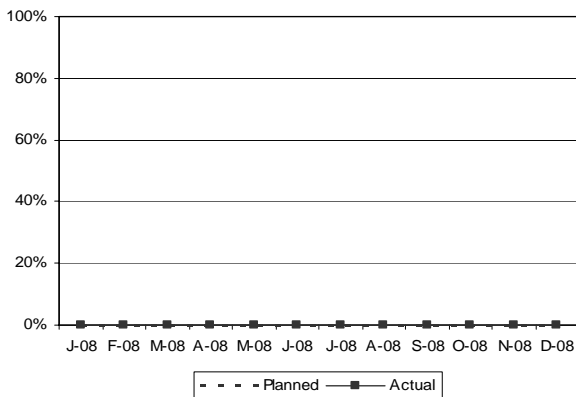
**Rehabilitation of Water Pumping Stations**  
Progress - December 2008



**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 successfully completed the 21-day acceptance testing. At Hyde Park, the contractor completed disinfection of Section 72 and MWRA activated the line. The contractor began the 30-day field and function testing. Work continued on pressure testing Section 41 and 93. At Belmont the contractor installed the crane and manual hoist. No work was performed this month at Reservoir Road. At Spring Street the contractor completed abatement of PCB's, continued pulling wire for security, fire and lighting systems and completed the installation of new windows, lovers and dampers within the pump room.

**Hultman Aqueduct Interconnections Project**  
Progress - December 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:** The consultant completed revisions on the bid-ready documents and resubmitted to Procurement on November 27th. The documents are under review. This will be a four year construction contract with a latest engineering estimate of \$52.7 million.

# CSO CONTROL PROGRAM

2<sup>nd</sup> Quarter FY09

22 of the 35 CSO projects in MWRA's Long-Term Control Plan were complete as of 1/09.

Project	Court Milestones in Schedule Seven (Shaded milestones are met.)			Status	
	Commence Design	Commence Construction	Complete Construction		
North Dorchester Bay Storage Tunnel and Related Facilities	Aug 97	Aug 06	May 11	<u>Tunnel construction</u> : tunnel complete; work continues on CSO and stormwater diversion structures and related piping. <u>Facilities design</u> : dewatering pump station and force main contract advertised 12/27/08; final design to prepare separate remote odor control facility contract documents is underway	
East Boston Branch Sewer Relief	Mar 00	Mar 03	Jul 10	Contract 1 (interceptor relining) completed 2004; Contract 2 (microtunneling) commenced 7/08 (one month later than court milestone); Contract 3 (pipe bursting) at 100% design.	
	Jun 06	Jun 08			
Cottage Farm Brookline Connection and Inflow Controls	Sep 06	Jun 08	Jun 09	Construction underway toward substantial completion in 6/09.	
Charles River Interceptor Gate Controls and Additional Connections	Jan 08	Jan 10	Jan 11	Design commenced 1/08; preliminary design report due 1/09; report evaluating additional interceptor connections will be submitted to EPA and DEP 1/09, in compliance with Schedule Seven.	
South Dorchester Bay Sewer Separation	Jun 96	Apr 99	Nov 08	Sewer separation contracts completed 12/06; CSO outfalls confirmed closed 10/07; MWRA decommissioned Fox Point and Commercial Point CSO facilities 11/07; BWSC continues to perform stormwater inflow removal to meet sewer system hydraulic performance criteria.	
Morrissey Boulevard Storm Drain	Jun 05	Dec 06	Jun 09	BWSC construction underway toward 6/09 substantial completion.	
Reserved Channel Sewer Separation	Jul 06	May 09	Dec 15	BWSC final design underway; first of nine planned contracts advertised 1/09; nine contracts scheduled to be awarded from 4/09 through 4/14.	
Bulfinch Triangle Sewer Separation	Nov 06	Nov 08	Jul 13	BWSC commenced construction contract 9/08; progress on schedule	
Brookline Sewer Separation	Nov 06	Nov 08	Jul 13	Brookline commenced first of two construction contracts 11/08; second contract to be advertised 4/09.	
Cambridge/ Alewife Brook Sewer Separation	CAM004 Outfall and Detention Basin		Jul 08*	Jul 09*	Cambridge resumed design 10/08 after 27-month delay due to wetlands permit appeals.
	CAM004 Sewer Separation	Jan 97	Jul 98	Jan 13*	Design will resume in the future, once other Alewife project elements move into construction.
			Jul 09*		
	CAM400 Manhole Separation	Jul 06*	Jul 07*	Jul 08*	Cambridge commenced design 10/08.
	Interceptor Connection Relief/Floatables	Jul 06*	Jan 08*	Dec 08*	Cambridge commenced design 10/08.
MWR003 Gate and Rindge Ave. Siphon	Apr 09*	Nov 10*	Jan 12*	MWRA to commence design by 7/11.	

\* MWRA and City of Cambridge are unable to meet certain court milestones for Alewife Brook project due to 27-month delay caused by wetlands permit appeals (now substantially resolved).

## CIP Expenditures December 2008

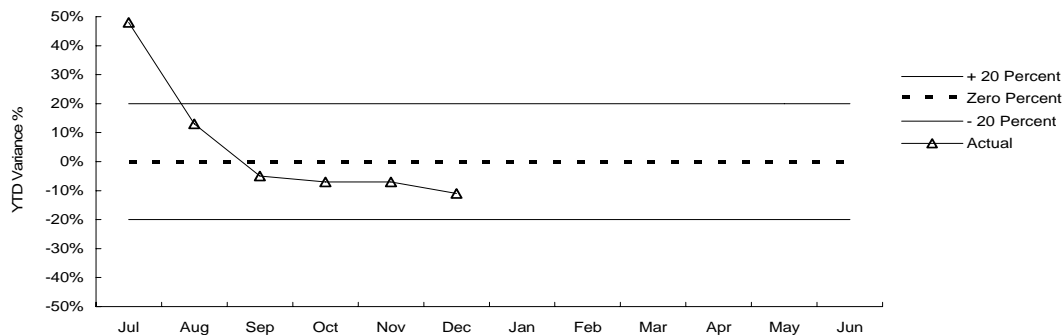
Accurate projections of CIP spending are one measure of effective project management and are important to ensuring that funds are available to support MWRA's capital program.

FY09 Capital Improvement Program Expenditure Variances through December by Program (\$000)				
Program	FY09 Budget Through December	FY09 Actual Through December	Variance Amount	Variance Percent
Wastewater	73,498	63,552	(9,946)	-14%
Waterworks	32,316	32,880	563	2%
Business and Operations Support	3,935	1,653	(2,282)	-58%
<b>Total</b>	<b>\$109,749</b>	<b>\$98,085</b>	<b>(\$11,665)</b>	<b>-11%</b>

Underspending within Wastewater is largely due to lower and shifted spending on the Morrissey Boulevard project by BWSC (these changes will not affect project schedule), a lower-than-expected award amount and slower-than-expected progress with early construction activities for the East Boston Branch Sewer Relief contract, and a delay in the award of Deer Island Heat Loop Pipe replacement contract. Overspending in Waterworks is primarily due to contractor progress on the Blue Hills Covered Storage project and community requests for loans were greater than anticipated. This was partially offset by a revised schedule for the Hultman Rehabilitation contract (CP6A).

### CIP Expenditure Variance

*Total FY09 CIP Budget of \$230,022,000.*



### 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 1/24/09	\$71 million
Unused capacity under the debt cap:	\$786 million
Estimated date for exhausting construction fund without new borrowing:	Feb-09
Estimated date for debt cap increase to support new borrowing:	FY2011
Commercial paper outstanding:	\$271 million
Commercial paper capacity:	\$350 million
Budgeted FY09 capital spending*:	\$206 million
Projected FY09 grant and SRF receipt:	\$103 million

\* Cash based spending is discounted for construction retainage.

# DRINKING WATER QUALITY AND SUPPLY

# Source Water – Microbial Results

2nd Quarter - FY09

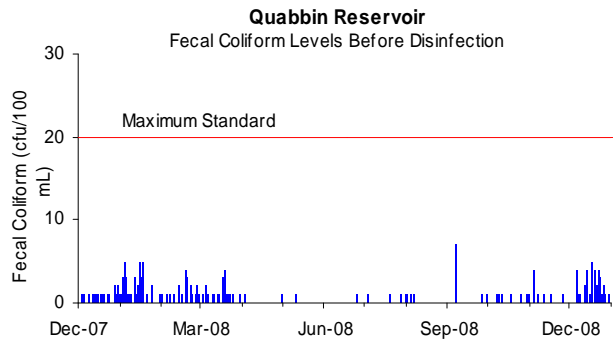
## Background

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

### Sample Site: Quabbin Reservoir

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

All samples collected during the 2nd Quarter were below 20 cfu/100ml. For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100ml.



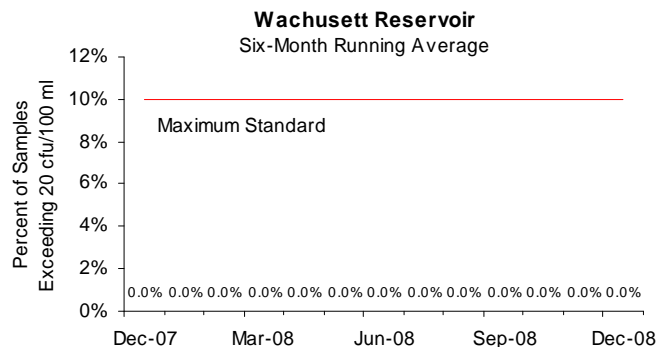
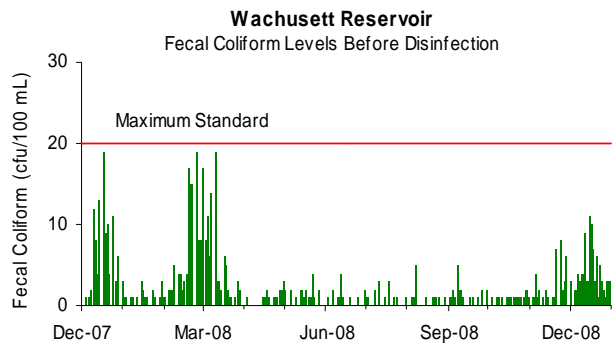
### Sample Site: Wachusett Reservoir

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

DCR has an active bird harassment program to move birds away from the intake area. Sporadic bird observations were performed in August and September. The bird harassment program was fully implemented with bird monitoring (Monday through Friday) in October 2008.

All samples collected during the 2nd Quarter were below 20 cfu/100ml. On December 1, 2008, sampling at the CWTP raw water tap was increased from five days to seven days per week.

For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/ 100ml.



# Source Water – Turbidity

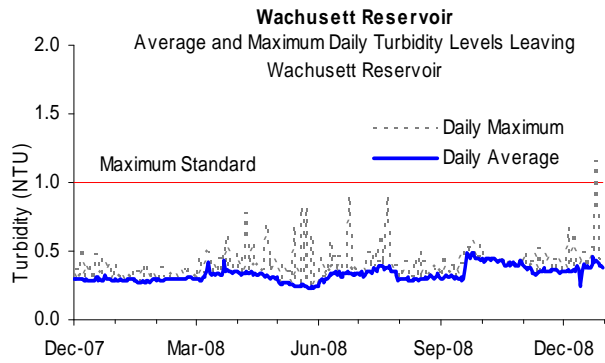
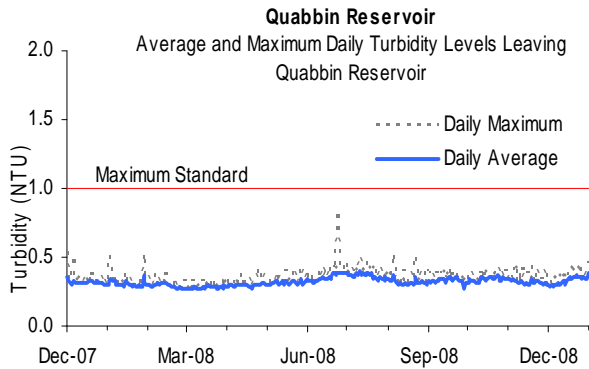
2nd Quarter - FY09

## 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.

Turbidity of Quabbin Reservoir water is monitored continuously using on-line analyzers at the Ware Disinfection Facility before chlorination. Turbidity of the Wachusett Reservoir is monitored continuously at the Carroll Water Treatment Plant before ozonation. The Massachusetts Department of Environmental Protection (DEP) standard for source water turbidity for unfiltered water supply systems is a maximum of 1.0 NTU; EPA's standard is a maximum of 5.0 NTU. Maximum turbidity results at Quabbin were within DEP standards for the quarter.

•Wachusett Reservoir exceeded the DEP standard on December 25, 2008; maximum turbidity reached 1.17 NTU for a duration of 15 minutes. CT was met at all times and chlorine residuals downstream were unaffected. Daily coliform results downstream were coliform free. This was not a permit violation.

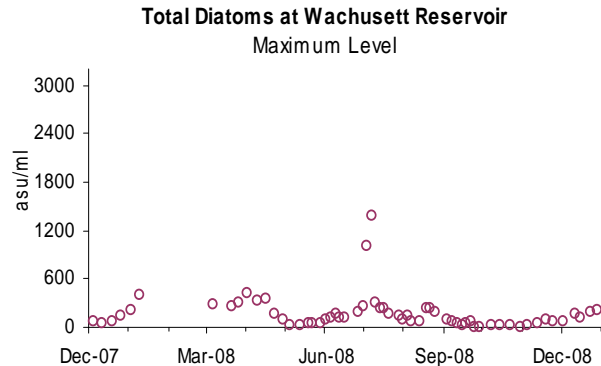
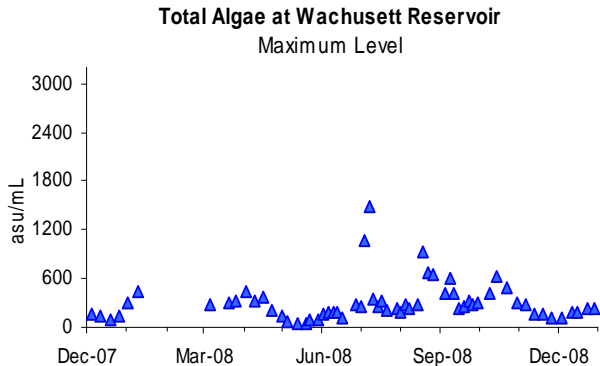


## Source Water – Algae

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 algicide. 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 are currently low.

Algal levels were low during the 2nd Quarter.





# Treated Water – Disinfection Effectiveness

2nd Quarter - FY09

## Background

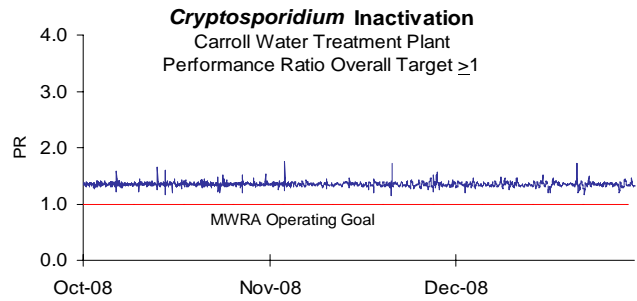
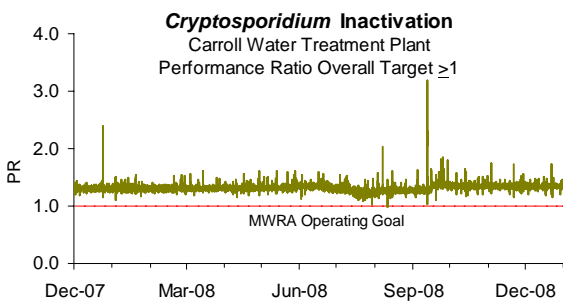
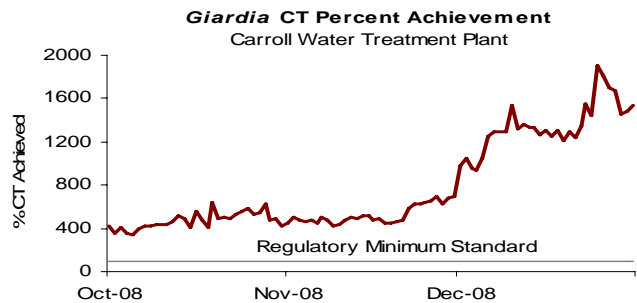
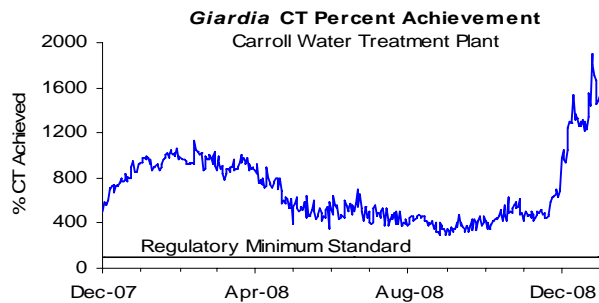
With the activation of the Carroll Water Treatment Plant (CWTP), MWRA now reports on both regulatory required 99.9% inactivation for *Giardia* (reported as “CT”), and its voluntary operating goal of 99% inactivation for *Cryptosporidium*. MWRA calculates hourly CT inactivation rates and reports daily 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. Compliance with the *Giardia* standard is expressed as percent of required CT achieved; 100% is the minimum allowed. 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.

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

•CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter; PR was maintained above 1.

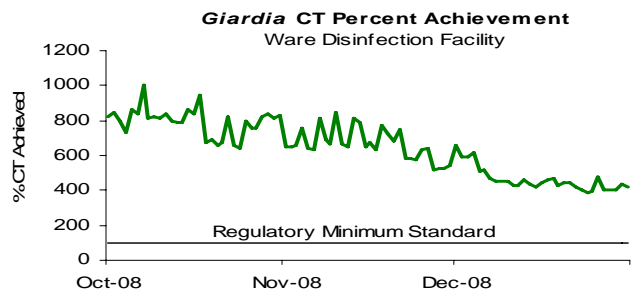
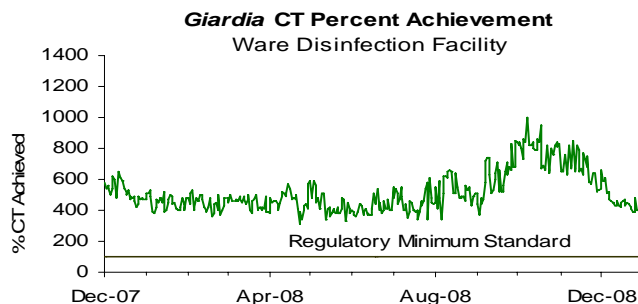
•Ozone dose at the CWTP varied between 1.9 to 3.3 mg/L for the quarter.

•On December 1, 2008, MWRA implemented the use of a new semi-automated program for calculating and reporting CT achievement (“CT Calculator”). The CT Calculator includes credit for CT achieved in the extended contactors. While CT credit for this area has not been taken in the past and has not been needed to meet regulatory CT requirements, the development of the CT Calculator improves MWRA’s ability to take additional credit for CT achieved. Ozone dosage at CWTP continues to be based on meeting PR goals, not CT.



### 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.

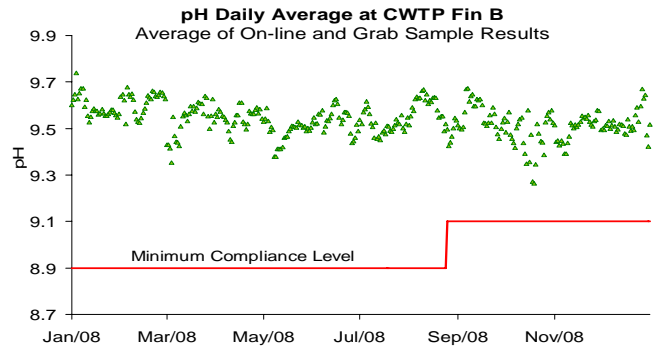
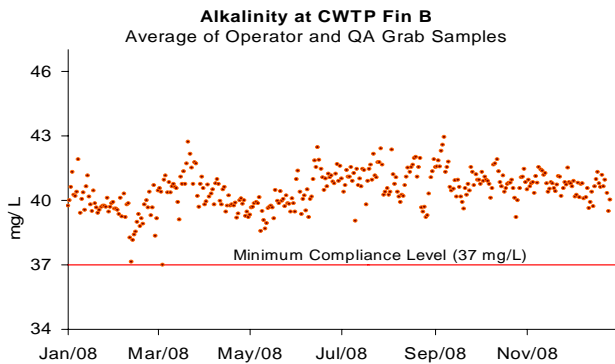


## Treated Water – pH and Alkalinity Compliance

2nd Quarter - FY09

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. Recognizing the effectiveness of MWRA's treatment targets, DEP changed the minimum compliance level upwards by 0.2 units on August 25, 2008; this was initiated in September 2008. Per DEP requirements, samples from the CWTP Fin B tap have a minimum compliance level of 9.1 for pH and 37 mg/L for alkalinity. Samples from 27 distribution system taps have a minimum compliance level of 9.0 for pH and 37 mg/L for alkalinity. Results must not be below this level for more than nine days in a six-month period. MWRA tests finished water pH and alkalinity daily at the CWTP Fin B sampling tap. Distribution system samples are collected in March, June, September, and December.

Distribution system samples were collected on December 16, 2008; sample pH ranged from 9.3 to 9.6 and alkalinity ranged from 40 to 42 mg/L. No sample results were below DEP limits for the 2nd Quarter.



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

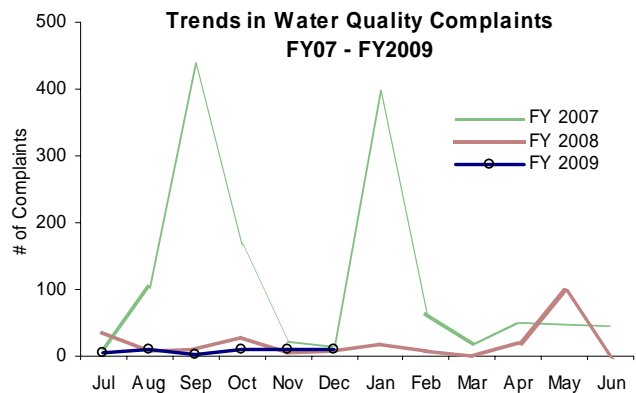
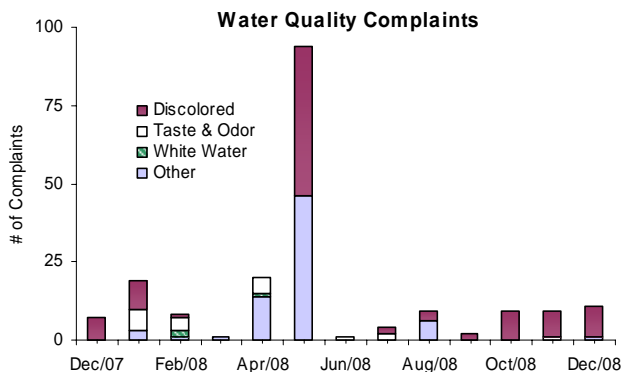
### Background

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.

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 29 water complaints during the 2nd Quarter. Of these complaints, 27 were for "discolored water", most of which were the result of construction in the area or water main breaks.



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

2nd Quarter - FY09

While all communities collect bacteria samples for the Total Coliform Rule (TCR), 40 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 potential 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. A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

### Highlights

In the 2nd Quarter, one of the 5,624 community samples (0.02% system-wide) submitted to MWRA labs for analysis tested positive for coliform (Framingham, November). Two of the 2,088 (0.05%) MWRA samples tested positive for total coliform. No sample tested positive for *E.coli*. All 40 systems that submitted chlorine residual data maintained an average disinfectant residual of at least 0.2 mg/L. Only 3.9% of samples had any results with 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	180	0 (0%)	0.0%		0.01	1.68
BELMONT	104	0 (0%)	0.0%		0.65	1.86
BOSTON	741	0 (0%)	0.0%		0.14	2.20
BROOKLINE	221	0 (0%)	0.0%		0.97	2.25
CHELSEA	130	0 (0%)	0.0%		1.41	2.06
DEER ISLAND	44	0 (0%)	0.0%		1.42	2.06
EVERETT	120	0 (0%)	0.0%		1.00	1.08
FRAMINGHAM	219	1 (0.46%)	0.0%	No	0.34	1.93
HANSCOM AFB (Bedford) (b)	27	0 (0%)	0.0%		0.04	1.08
LEXINGTON	116	0 (0%)	0.0%		0.39	2.12
LYNNFIELD	18	0 (0%)	0.0%		0.34	1.07
MALDEN	195	0 (0%)	0.0%		1.20	1.28
MARBLEHEAD	72	0 (0%)	0.0%		0.11	1.67
MARLBOROUGH (b)	159	0 (0%)	0.0%		0.02	1.69
MEDFORD	221	0 (0%)	0.0%		0.11	1.80
MELROSE	117	0 (0%)	0.0%		0.03	0.74
MILTON	96	0 (0%)	0.0%		0.93	1.56
NAHANT	30	0 (0%)	0.0%		0.09	1.41
NEEDHAM (b)	118	0 (0%)	0.0%		0.01	0.48
NEWTON	276	0 (0%)	0.0%		0.25	1.87
NORTHBOROUGH	48	0 (0%)	0.0%		0.02	1.57
NORWOOD	108	0 (0%)	0.0%		0.01	1.52
QUINCY	308	0 (0%)	0.0%		0.14	1.78
READING	130	0 (0%)	0.0%		0.09	1.78
REVERE	183	0 (0%)	0.0%		0.63	1.86
SAUGUS	104	0 (0%)	0.0%		1.70	2.00
SOMERVILLE	280	0 (0%)	0.0%		0.30	1.99
SOUTH HADLEY FD1 (c)	48	0 (0%)	0.0%		0.03	0.22
SOUTHBOROUGH	31	0 (0%)	0.0%		0.21	1.56
STONEHAM	98	0 (0%)	0.0%		1.27	2.17
SWAMPSCOTT	54	0 (0%)	0.0%		0.03	1.36
WAKEFIELD (b)	154	0 (0%)	0.0%		0.14	1.43
WALTHAM	217	0 (0%)	0.0%		0.10	2.02
WATERTOWN	140	0 (0%)	0.0%		0.12	1.76
WELLESLEY (b)	107	0 (0%)	0.0%		0.04	0.59
WESTBORO HOSPITAL	15	0 (0%)	0.0%		0.13	1.48
WESTON	48	0 (0%)	0.0%		0.28	1.71
WINCHESTER (b)	65	0 (0%)	0.0%		0.06	0.83
WINTHROP	72	0 (0%)	0.0%		0.01	1.27
WOBURN (b)	210	0 (0%)	0.0%		0.02	0.91
Total:	5624	1(0.02%)				
MASS. WATER RESOURCES AUTHORITY (d)	2088	2 (0.05%)	0.0%		0.03	1.91

(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

## 2nd Quarter - FY09

### Background

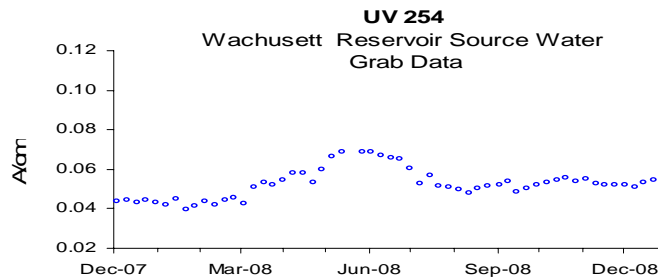
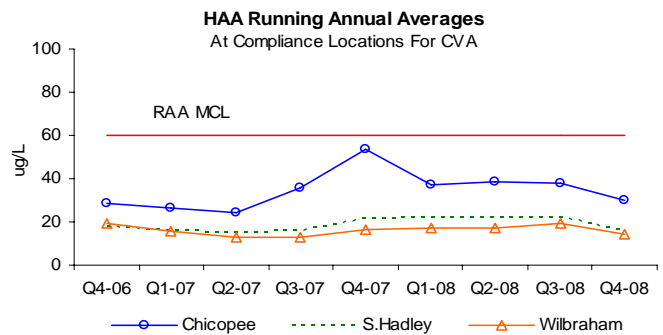
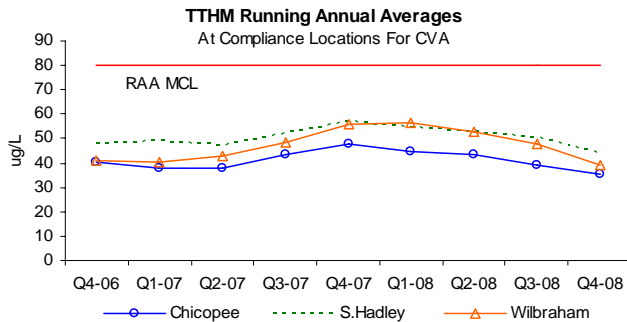
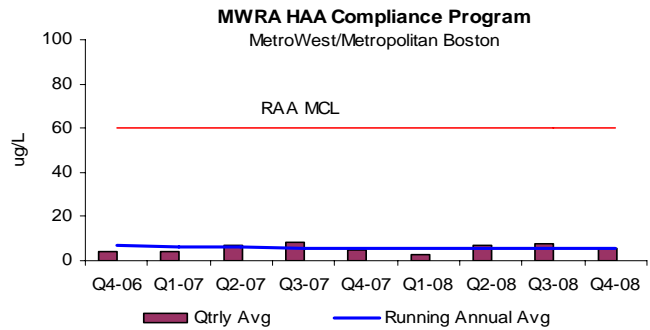
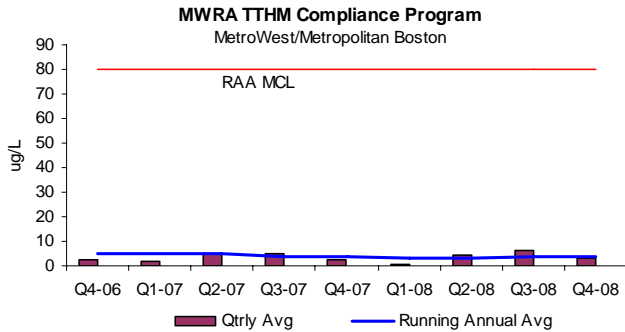
Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s) are by-products of disinfection treatment with chlorine. TTHMs and HAA5s are of concern due to their potential adverse health effects at high levels. EPA's running annual average (RAA) standard is 80 ug/L for TTHMs and 60 ug/L for HAA5s. The switch from chlorine to ozone for primary disinfection and the consolidation of treatment has lowered DBP formation and results are now 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 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.

### Outcome

The RAA for TTHMs and HAA5s for MWRA's Compliance Program (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. The RAA for TTHMs = 3.7 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. The current RAA for Bromate = 0.0 ug/L.



# Water Supply and Source Water Management

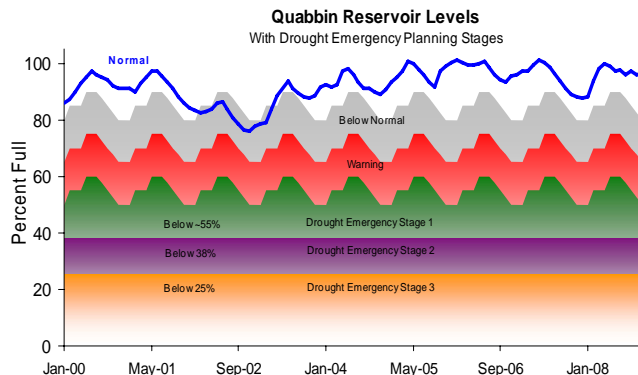
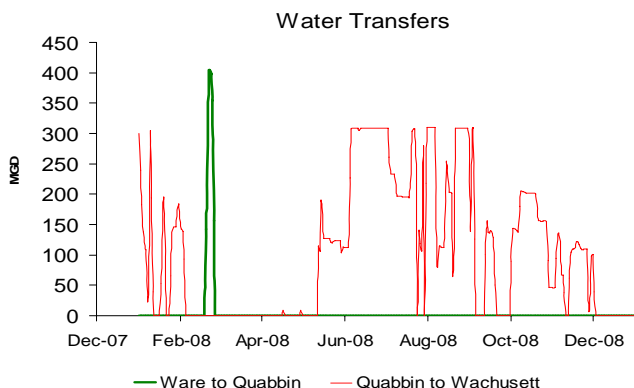
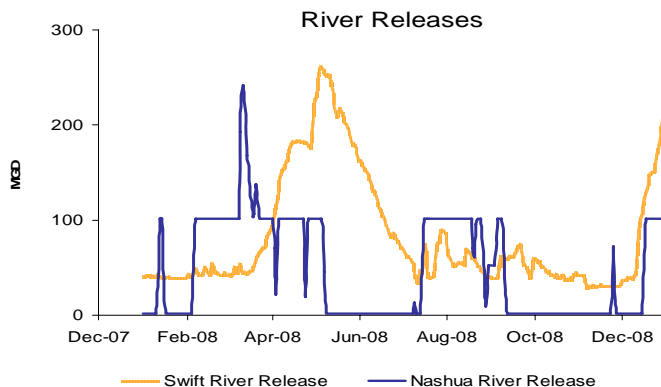
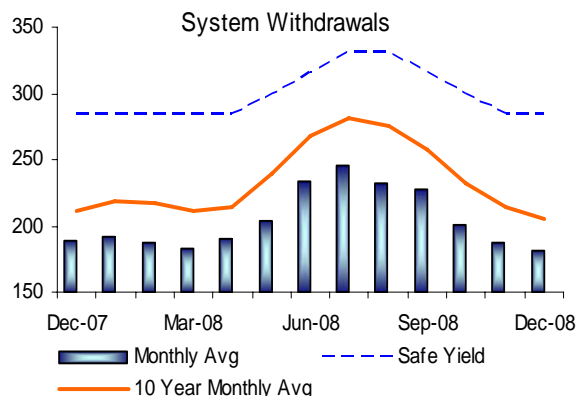
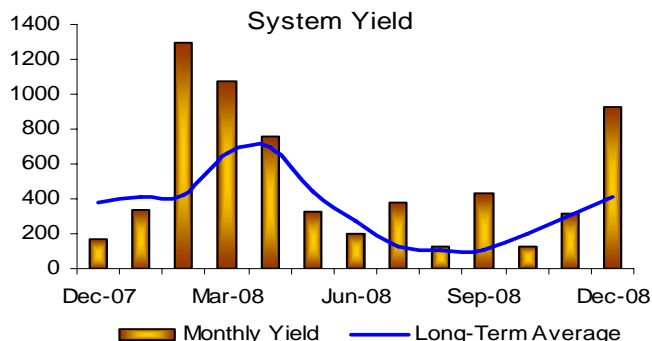
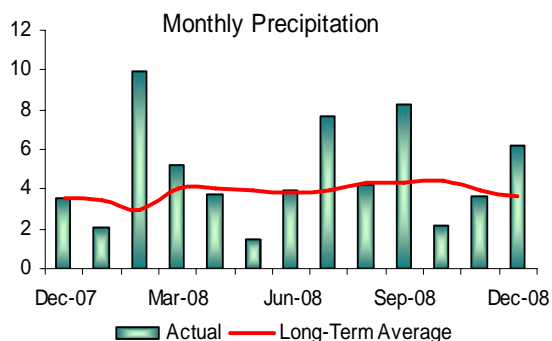
2nd Quarter - FY09

## Background

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

## Outcome

Quabbin Reservoir level is above the normal operating range for this period of the year. Quabbin Reservoir was at 99.9% of capacity as of December 31, 2008; 12.3% higher than the same time last year. This is an increase of more than 50 billion gallons of storage. Above-average precipitation for the quarter, combined with above-average reservoir elevation, resulted in spillage at the lower spillway for most of the quarter and above-average system yields. Lower system withdrawals also contributed to the above-average yields for the quarter.



# WASTEWATER QUALITY

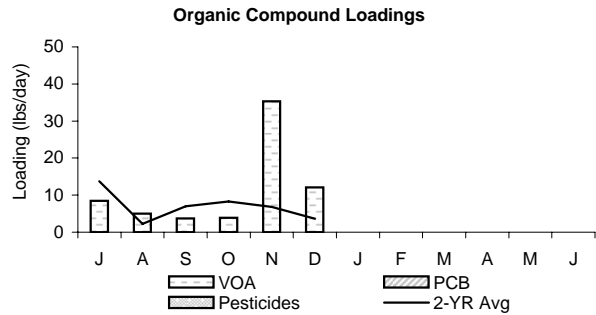
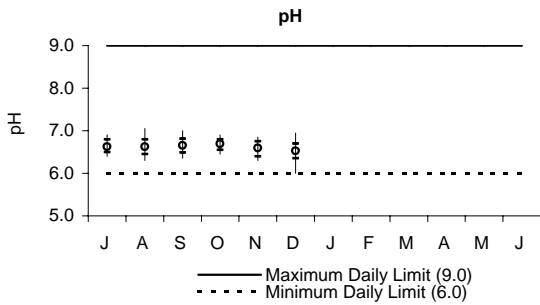
# NPDES Permit Compliance: Deer Island Treatment Plant

## 2nd Quarter - FY09

### NPDES Permit Limits

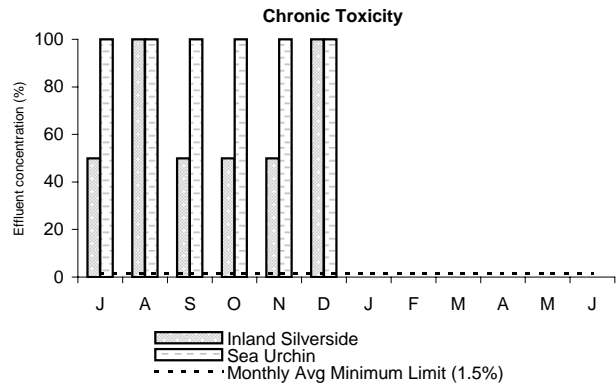
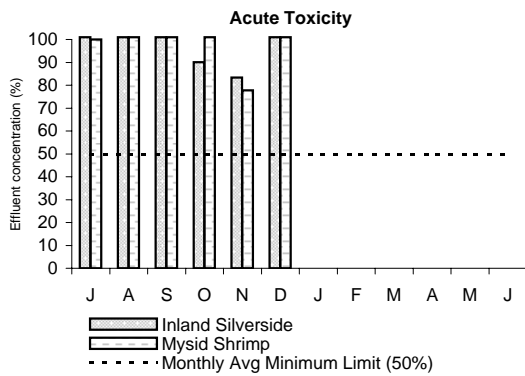
Effluent Characteristics		Units	Limits	October	November	December	2nd Quarter Violations	FY09 YTD Violations
Dry Day Flow:		mgd	436	310.4	314.2	317.3	0	0
cBOD:	Monthly Average	mg/L	25	3.6	5.4	5.6	0	0
	Weekly Average	mg/L	40	3.6	6.4	8.1	0	0
TSS:	Monthly Average	mg/L	30	4.8	6.9	9.1	0	0
	Weekly Average	mg/L	45	6.0	8.3	15.0	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	437.6	8.1	172.0	0	0
	Weekly Geometric Mean	col/100mL	14000	160.4	12.0	24.2	0	0
	% of Samples >14000	%	10	0	0	0	0	0
	Consecutive Samples >14000	#	3	0	0	0	0	0
pH:		SU	6.0-9.0	6.5-6.9	6.3-6.9	6.0-7.0	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	50	>100	>100	>100	0	0
	Inland Silverside	%	50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	1.5	100	100	100	0	0
	Inland Silverside	%	1.5	50	50	100	0	0

To date, there have been no permit violations at the Deer Island Treatment Plant during the first two quarters of FY09.



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 tends to be at the lower pH range. pH measurements for the 2nd Quarter were within the daily limits.

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



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 2nd Quarter for both the inland silverside and mysid shrimp.

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 permit limits, 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 2nd Quarter for both the inland silverside and sea urchin.

# NPDES Permit Compliance: Clinton Wastewater Treatment Plant

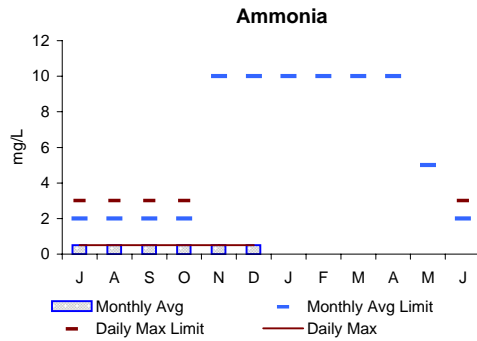
## 2nd Quarter - FY09

### NPDES Permit Limits

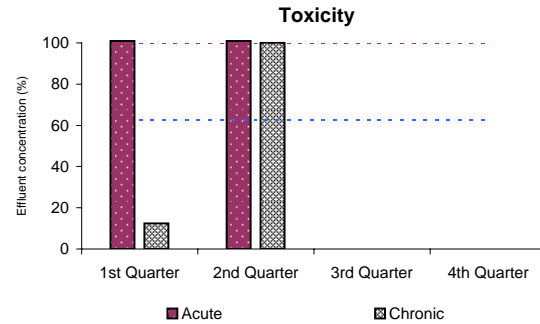
Effluent Characteristics		Units	Limits	October	November	December	2nd Quarter Violations	FY09 YTD Violations
Flow:		mgd	3.01	3.13	3.16	3.32	3	4
BOD:	Monthly Average:	mg/L	20	3.4	5.7	3.9	0	0
	Weekly Average:	mg/L	20	4.0	6.9	4.3	0	0
TSS:	Monthly Average:	mg/L	20	5.6	8.3	3.6	0	0
	Weekly Average:	mg/L	20	7.5	13.0	4.6	0	0
pH:		SU	6.5-8.3	7.0-7.6	7.1-7.6	7.1-7.7	0	0
Dissolved Oxygen:	Daily Minimum:	mg/L	6	8.2	8.1	9.0	0	0
	Daily Geometric Mean:	col/100mL	400	5	9	9	0	0
Fecal Coliform:	Monthly Geometric Mean:	col/100mL	200	2	4	3	0	0
	Daily Maximum:	ug/L	50	0	0	0	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: 11/1-3/31								
Monthly Average:		mg/L	10.0	0.5	0.5	0.5	0	0
Daily Maximum:		mg/L	35.2	0.5	0.5	0.5	0	0
Copper: Monthly Average:		ug/L	20	6.7	13.1	8.0	0	0
Phosphorus: May 1 - Oct 31								
Monthly Average:		mg/L	1.0	0.19	N/A	N/A	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	1

The monthly average flows at the Clinton Wastewater Treatment Plant for all three months in the 2nd Quarter exceeded the permit limit of 3.01 mgd.

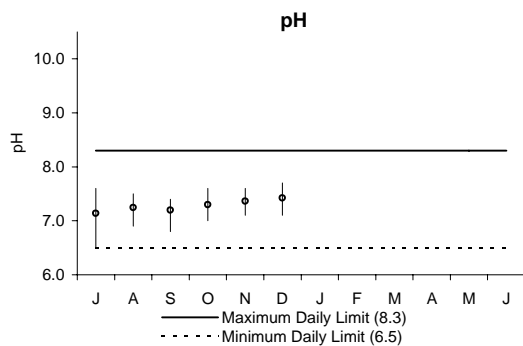
Toxicity testing is conducted on a quarterly basis.



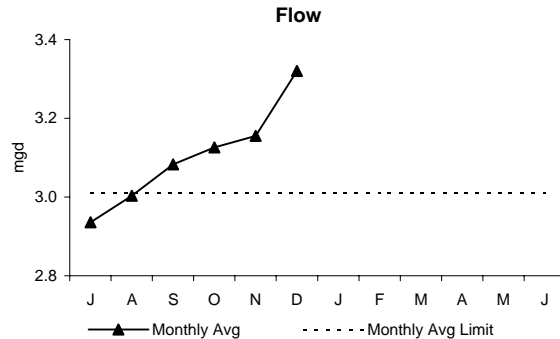
The 2nd Quarter's monthly average and daily maximum concentrations were below permit limits. The monthly average and daily maximum limits for the period of November 1 - March 31 are 10 mg/L and 35.2 mg/L, respectively. The permit limits are most stringent from June-October, when warm weather conditions 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 62.5%, respectively. Acute and chronic toxicity limits were met during the 2nd Quarter.



pH is a measure of the alkalinity or acidity of the effluent. All daily pH results for the 2nd Quarter were within permit limits.



This graph depicts the average monthly flow, measured in million gallons per day, entering the Clinton Plant. The average monthly flows during the 2nd Quarter were 3.13 mgd, 3.16 mgd, and 3.32 mgd for October, November, and December, respectively; the permit limit is 3.01 mgd.

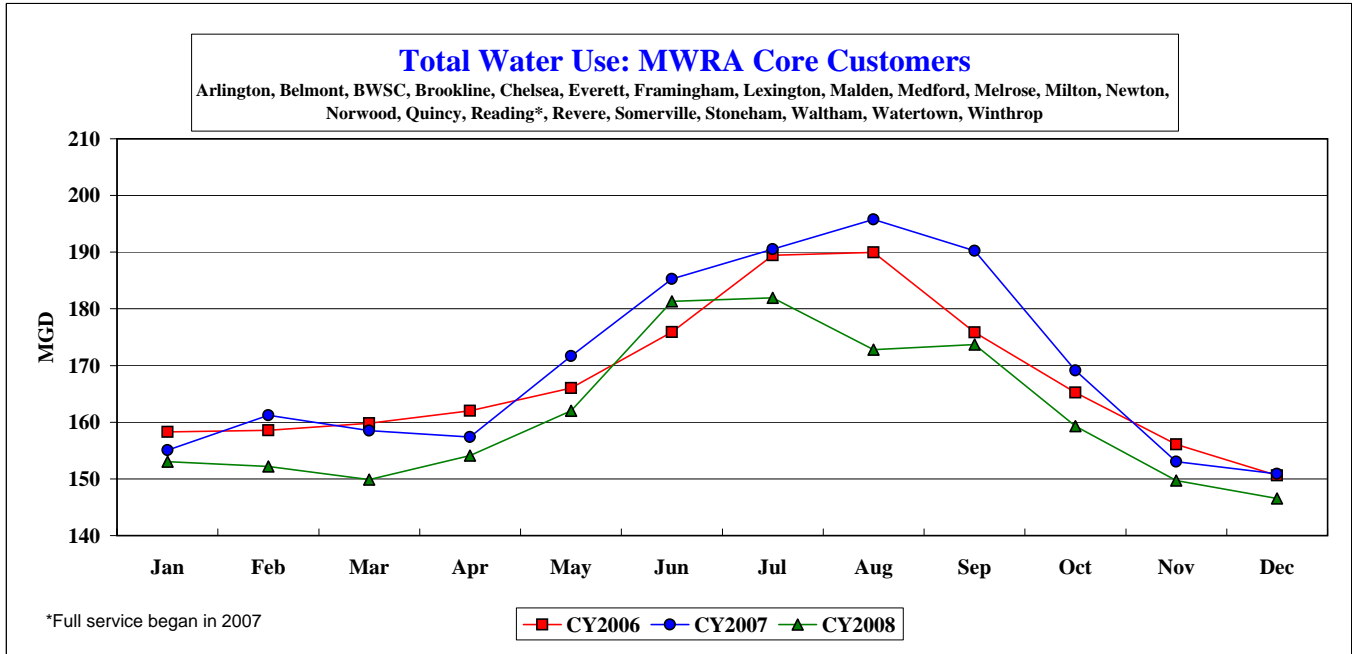


# COMMUNITY FLOWS AND PROGRAMS

## Total Water Use: MWRA Core Customer Communities

MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
<b>CY2006</b>	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
<b>CY2007</b>	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
<b>CY2008</b>	153.035	152.189	149.874	154.139	161.989	181.307	181.934	172.806	173.706	159.314	149.690	146.564	161.393

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>CY2006</b>	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
<b>CY2007</b>	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
<b>CY2008</b>	4,744.091	4,413.477	4,646.087	4,624.185	5,021.664	5,439.220	5,639.940	5,356.984	5,211.188	4,938.739	4,490.700	4,543.487	59,069.762



# How CY2008 Community Wastewater Flows Through Ten Months Could Effect FY2010 Sewer Assessments<sup>1,2,4</sup>

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.

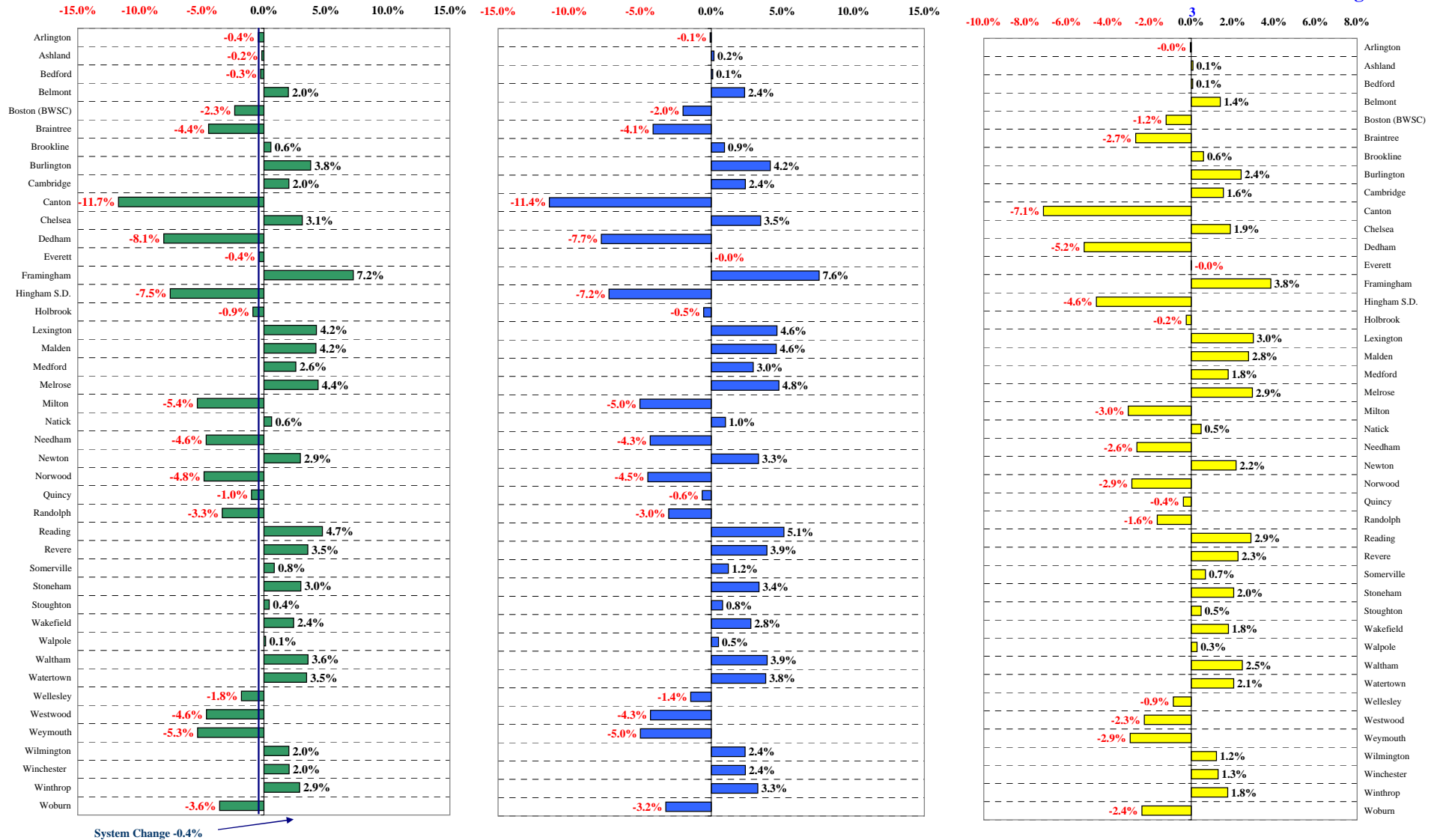
But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the **RELATIVE** change in CY2006 to CY2008 flow share compared to CY2005 to CY2007 flow share, compared to all other communities in the system.

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



<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> Add this figure to the projected FY2010 system-wide average sewer rate increase of 9.5% (June 2008) to estimate each community's FY2010 sewer assessment change from FY2009.

<sup>4</sup> Based on CY2006 to CY2008 average wastewater flows as of 12/17/08.

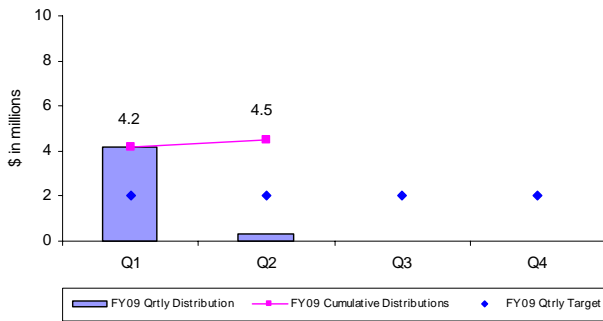
# Community Support Programs

## 2<sup>nd</sup> Quarter – FY09

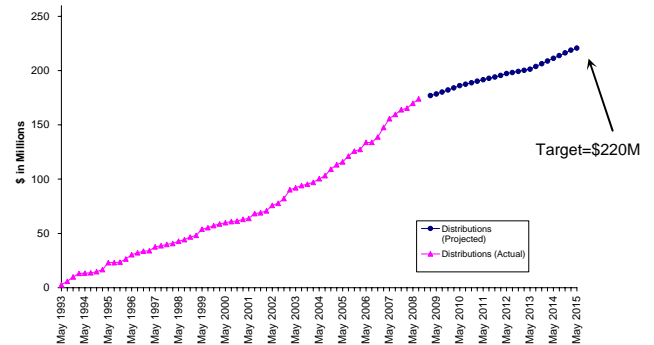
### Infiltration/Inflow Local Financial Assistance Program

The MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides \$220.75 million in grants and interest-free loans (average of about \$10 million per year from FY93 through FY15) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Eligible project costs include: sewer rehabilitation construction, pipeline replacement, removal of public and private inflow sources, I/I reduction planning, engineering design, engineering services during construction, etc. I/I Local Financial Assistance Program funds are allocated to member sewer communities based on their percent share of MWRA's wholesale sewer charge. Interest-free loans are repaid to MWRA over a five-year period beginning one year after distribution of the funds.

**FY09 Quarterly Distributions of Sewer Grant/Loans**



**I/I Local Financial Assistance Program Distribution FY93-FY15 Target is \$220M**

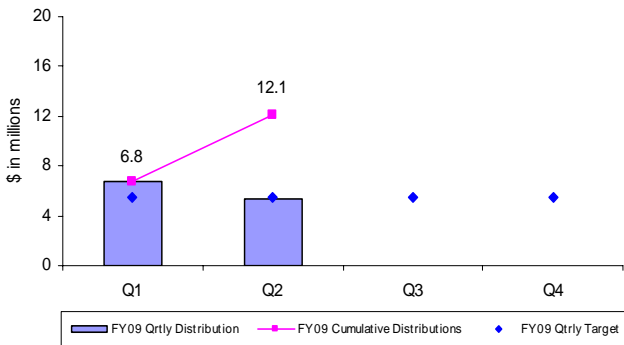


During the second quarter of FY09, \$352,000 in 45% grants and 55% interest-free loans was distributed to fund a sump pump removal project in Randolph. Total grant/loan distribution for FY09 is \$4.5 million. From FY93 through the second quarter of FY09, all 43 member sewer communities have participated in the program and more than \$174 million has been distributed to fund 360 local I/I reduction and sewer system rehabilitation projects. Distribution of the remaining funds has been approved through FY15 and community loan repayments will be made through FY20. All scheduled community loan repayments have been made.

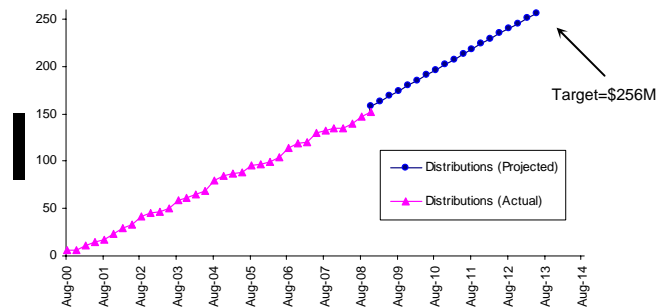
### Water Local Pipeline Assistance Program

The MWRA's Local Pipeline Assistance Program (LPAP) provides \$256,723,500 in interest-free loans (an average of about \$20 million per year from FY01 through FY13) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution system. Eligible project costs include: water main cleaning/lining, replacement of unlined water mains, lead service replacements, valve work along the pipe alignment, engineering design, engineering services during construction, etc. LPAP funds are allocated to member water communities based on their percent share of unlined water pipe. MWRA partially supplied communities receive pro-rated funding allocations based on their percentage use of MWRA water. Interest-free loans are repaid to MWRA over a ten-year period beginning one year after distribution of the funds.

**FY09 Quarterly Distributions of Water Loans**



**Water Local Pipeline Assistance Program Distribution FY01-FY13 Target is \$256M**

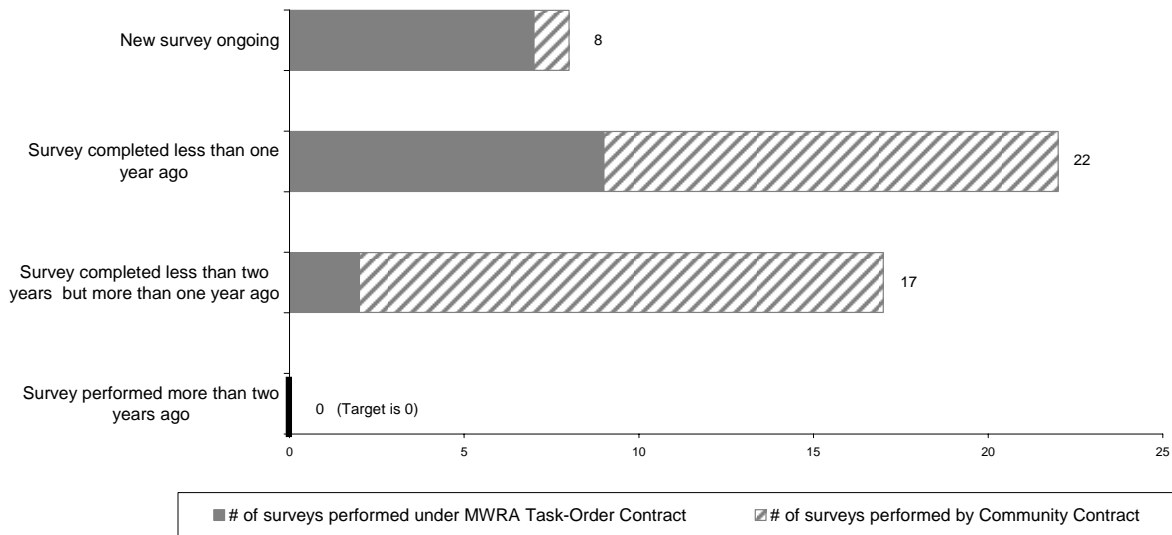


During the second quarter of FY09, \$5.3 million in interest-free loans was distributed to fund local water projects in Boston, Chelsea and Milton. Total loan distribution for FY09 is \$12.1 million. From FY01 through the second quarter of FY09, \$152 million has been distributed to fund 187 local water pipeline rehabilitation projects in 29 MWRA member water communities. Distribution of the remaining funds has been approved through FY13 and community loan repayments will be made through FY23. All scheduled community loan repayments have been made.

## Community Support Programs 2<sup>nd</sup> Quarter – FY09

### Community Water System Leak Detection

To ensure member water communities identify and repair leaks in local-owned distribution systems, MWRA developed leak detection regulations that went into effect in July 1991. Communities purchasing water from MWRA are required to complete a leak detection survey of their entire distribution system at least once every two years. Communities can accomplish the survey using their own contractor or municipal crews; or alternatively, using MWRA's task-order leak detection contract. MWRA's task-order contract provides leak detection services at a reasonable cost that has been procured (3-year low bid contract) taking advantage of the large volume of work anticipated throughout the regional system. Leak detection services performed under the task-order contract are paid by MWRA, and the costs are billed to the community the following year.



### Community Water Conservation Outreach

The MWRA's Community Water Conservation Program helps to maintain average water demand below the regional water system's safe yield of 300 mgd. Current average annual water demand is less than 220 mgd. The local water conservation program includes distribution of water conservation education brochures (indoor and outdoor bill-stuffers) and low-flow water fixtures and related materials (shower heads, faucet aerators, toilet leak detection dye tabs, and instructions), all at no cost to member communities or regional customers. The annual budget is \$25,000 for printing and purchase of materials. Annual distribution targets and totals are provided in the table below.

	Annual Target	Q1	Q2	Q3	Q4	Annual Total
Educational Brochures	200,000	4,534	8,929			13,463
Low-Flow Fixtures (showerheads and faucet aerators)	6,000	9,124	5,346			14,470
Toilet Leak Detection Dye Tablets	-----	5,818	5,037			10,855

## BUSINESS SERVICES

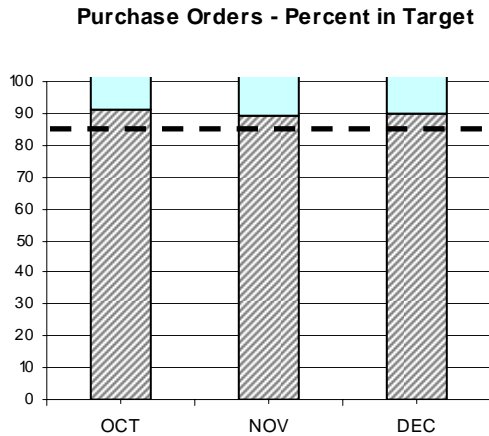
## Procurement: Purchasing and Contracts

### Second Quarter FY09

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

**Outcome:** Processed 91% of purchase orders within target; Avg. Processing Time was 4.24 days vs. 7.12 days in Qtr 2 of FY08. Processed 84% (27 of 32) contracts within target timeframes; Avg. Processing Time was 149 days vs. 106 days in Qtr 2 of FY08.

### Purchasing



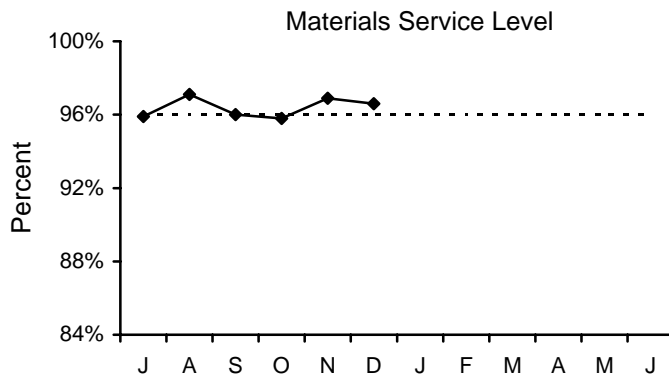
	NO.	TARGET	PERCENT IN TARGET
\$0 - \$500	1490	4 DAYS	89.9%
\$500 - \$2K	709	7 DAYS	93.9%
\$2K - \$5K	231	10 DAYS	88.3%
\$5K - \$10K	89	25 DAYS	93.3%
\$10K - \$25K	66	30 DAYS	80.3%
\$25K - \$50K	18	60 DAYS	83.3%
OVER \$50K	16	80 DAYS	81.2%

- Purchasing Unit processed 2619 purchase orders, 28 less than the 2647 processed in Qtr 2 of FY09, for a total value of \$8,128,391 vs. a dollar value of \$9,035,775 in Qtr 2 of FY08.
- The target was not achieved for the \$10k - \$25k category due to clarification of specifications and end user requirements and the over \$50k category because of a re-bid and clarification of specifications.

### Contracts, Change Orders and Amendments

- Procurement processed thirty-two contracts with a value of \$10,733,506 and seventeen amendments with a value of \$38,588,140.
- Five contracts were not processed within target timeframes. Reasons include: numerous addenda and delay in issuance of MBTA permit, changes in specifications, slow submission of insurance documentation by the contractor, and a post bid reconsideration of the scope of services and term of a contract.
- Thirty-one 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 2nd quarter FY09 was \$1,511,763 and the value of credit change orders was (\$397,576). The net dollar value of all change orders was \$1,114,187.
- In addition, staff reviewed 91 proposed change orders and 51 draft change orders.

## Materials Management 2nd Quarter, FY09



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 10,569 (96.6%) of the 10,937 items requested in Q2 from the inventory locations for a total dollar value of \$1,139,984.

### 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 FY09 goal is to reduce consumable inventory from the July '08 base level (\$6.84 million) by 2.0% (approximately \$136,823), to \$6.70 million by June 30, 2009 (see chart below).

Items added to inventory this quarter include:

- Deer Island – compressor filters, separators and belts and collar sets for Maintenance and solenoid valves for electrical.
- Chelsea – no new items were added this quarter.
- Southboro – ballasts, bushings and caulking for Maintenance. Ball check valves and catalysts were added for the John Carroll Walnut Hill Treatment Plant.

Property Pass Program:

- Numerous obsolete computers, printers, monitors, keyboards, mice and box cables have been received into property pass as surplus. Disposition will be handled as part of our ongoing recycling efforts.
- In addition, various metals and fibers have been scrapped resulting in a monetary return of \$4,821. Surplus efforts are ongoing throughout the MWRA.
- Six equipment repairs were made thereby eliminating the need to purchase new equipment resulting in a cost savings of \$6,575.
- Tool/equipment audits were conducted at Prison Point, Cottage Farm, Fox Point, Commercial and Caruso Pump Stations in addition to Ward Street, Chelsea Paint Shop and Nut Island Headworks during the second quarter.

Items	Base Value July-08	Current Value w/o Cumulative New Adds	(Reduction)/ Increase To Base
Consumable Inventory Value	6,841,161	6,882,489	41,328
Spare Parts Inventory Value	6,940,392	7,058,696	118,304
Total Inventory Value	13,781,553	13,941,185	159,632

**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.

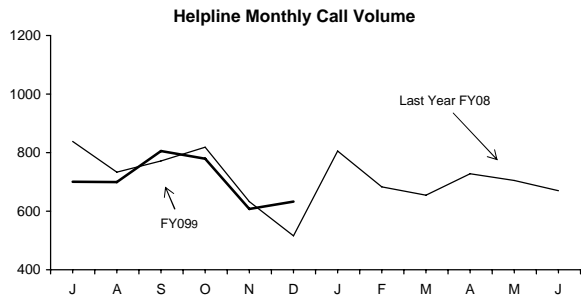


# MIS Program

## 2nd Quarter FY09

### Operations

#### Highlights:



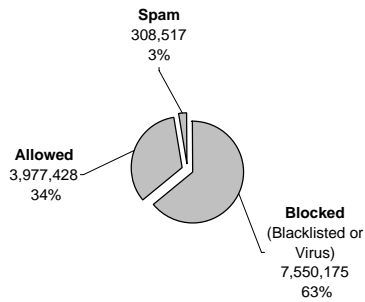
### Performance

Call volume peaked in October and has decreased by 1.99% from Q2 last year. The backlog also peaked in October and is above the targeted benchmark range. The mix of calls for the quarter do not indicate any major problems.

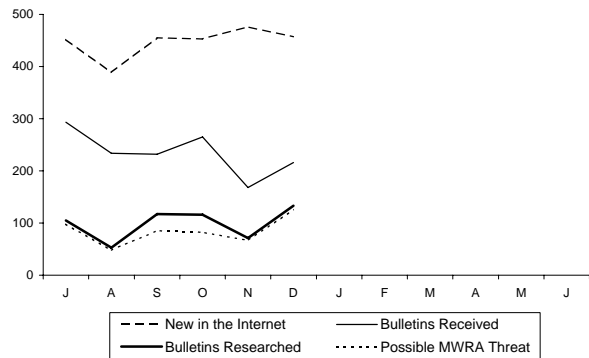
### Business System Plan

- **Cyber Security:** During Q2, staff pushed security fixes and updates to desktops and servers throughout the quarter in order to protect against the 1386 newly revealed vulnerabilities.
- Nine files were identified with viruses on MWRA computers this quarter and infected files were cleaned or deleted before any damage ensued.

#### Emails Received



#### Internet Vulnerabilities



- **Network & Systems** - Implemented new backup enhancement solutions that eliminate the need for the physical local backup at Southborough. This solution will enable the backup of planned storage growth at CWTP. Current backups of CL1, SB1, and WH1 servers are now being performed at Chelsea; Anti Virus upgrade - migrated from McAfee Protection Pilot to McAfee EPO 4.0 which provides centralized management of virus updates for servers; VPN - created a new portal maximovpn.mwra.com for Maximo Laptops.
- **Green Computing** - Researched and designed a solution for the consolidation of up to 12 infrastructure servers in the Chelsea data center that utilizes the latest blade technology reducing energy consumption and carbon footprint. Implementation of the solution is targeted for Q3/4. In addition to energy savings, the server maintenance cost savings projects to be over \$40K over a five year period.

### Applications/Training/Library & Records Center

Area	Significant Accomplishments
GIS	Applied Geographics Inc. (AGI) was awarded a contract to develop an integration framework for the new Pretreatment Information Management System (PIMS) and GIS. A project kickoff meeting was held in October with AGI, MIS, and the business users attending. Additionally, ruggedized laptops for the Water Pipeline Inspection group were configured for security protection (data encryption, Cyber Angel/Tracking, USB port restrictions). Arc Reader has been installed as viewer to allow users access to GIS Data such as pipe and valve information.
PIMS (TRAC-IS Replacement)	The new Pretreatment Information Management System (PIMS) successfully executed the annual permit fees process by TRAC. The vendor is continuing to work with MIS and TRAC staff to resolve data migration and functional issues as they arise and the design of an interface to the new LIMS system design is scheduled to begin in January.
Lawson Upgrade	December offered an opportunity to parallel test the 5th week payroll exception (occurs 4 times a year) on the new system. All payroll reports tied out with our production run. Full cycle (4 week) user parallel payroll testing is scheduled to begin in February. Completed another full test pass of the Lawson version 8 to 9 upgrade procedures that will be used to migrate live data to the new system when we go live this spring.
Library & Records Center	Began exploring options for moving the Records Center, completed scanning and microfilming historic sewer permits which will be available to link with GIS to support Dig-Safe & Survey activities, began bar-coding and scanning 2nd floor records, added 169 and disposed of 269 boxes. The library Distributed 1405 articles (3093 YTD) electronically to staff, and 246 articles (575 YTD) from table of content circulations.
Training	For the quarter, 54 staff attended 20 classes and 9 workshops. Year-to-date, 342 staff have attended 65 classes and 24 workshops. 11% of the workforce have attended at least one class year-to-date. Began development of Office 2007 training materials.

# Legal Matters

## 2nd Quarter FY2009

### PROJECT ASSISTANCE

#### COURT AND ADMINISTRATIVE ORDERS

- **Boston Harbor Litigation and CSO:** Submitted Special Report of MWRA concerning Fore River pelletizing plant to Federal District Court. Filed Quarterly Compliance and Progress Report and CSO Quarterly Progress Report with the Court.
- **NPDES:** Updated CSO information to be submitted to EPA and DEP as part of a supplement to MWRA's NPDES permit renewal application for Deer Island.
- **Administrative Consent Order (DITP power outages):** Submitted semi-annual report to DEP in accordance with the Administrative Consent Order

#### REAL ESTATE AND CONTRACT

- **Columbus Park Headworks:** Drafted a license agreement for the development and operation of a Dog Recreational Area adjacent to the Columbus Park Headworks.
- **Capen Court - Somerville:** Reviewed and finalized terms for MWRA easement relocations and reserved rights necessary for the development of the Capen Court Project in Somerville.
- **Water Preservation Restriction:** Identified issues in appraisals for the acquisition of a Watershed Preservation Restriction Area in Holden.
- **Utility Relocation:** Developed standard form of Notice for Utility Relocation Orders for Construction Contracts.
- **Turkey Hill, Arlington:** Reviewed, revised and finalized Permit with MetroPCS Massachusetts, LLC for installation and operations of facilities at Turkey Hill in Arlington
- **Hydrogen Peroxide Antitrust Litigation:** Filed a "Proof Of Claim" on behalf of the MWRA in the Hydrogen Peroxide Antitrust Litigation to enable MWRA to be considered for some portion of a settlement reached with ten defendants in that action.
- **Flaggers/Police Detail regulations:** Met with Executive Office of Transportation and Massachusetts Highway Department staff to discuss regulations concerning road flaggers and police details for public works projects, and implementation strategies. Involved in the internal process to develop strategies for implementation.
- **Trench Safety:** Provided guidance to staff on Trench Safety regulations promulgated by the State Department of Public Safety.
- **Forward Capacity Market:** Met with ISO New England to discuss MWRA's potential entry into the Forward Capacity energy market. Developed draft counter-proposal to NStar.
- **Section 8(m) permits:** Reviewed and approved 28 Section 8(m) permits; Developed a new draft standard form of permit.

#### ENVIRONMENTAL

- **Beede Superfund/CERCLA Case:** submitted final settlement payment to EPA which 1) resolves the MWRA's liability entirely with the EPA and New Hampshire Dept. of Environmental Services with respect to the site, and 2) protects the MWRA from any law suits brought by other potentially responsible parties in the case seeking contribution from MWRA.
- **C. 21E/ Shaft L:** directed search and extensive review of archived files, and met with staff to develop response to DEP's Request for Information (RFI) under c. 21E, relative to the blasting associated with the construction of Shaft L of the Metrowest Water Supply Tunnel. Submitted response.
- **IPS Wetlands Mitigation:** Drafted MOU between MWRA and Town of Weymouth and revised DEP draft of Administrative Consent Order relating to completion of wetlands replication project.

- **Clarifiers Contract:** Assist with efforts to resolve MBE/WBE partial waiver request to DEP.

## LABOR, EMPLOYMENT AND ADMINISTRATIVE

### New Matters:

Eight demands for arbitration were filed.

One charge was filed at the Massachusetts Commission Against Discrimination.

One charge of a prohibited practice was filed at the Labor Relations Commission.

MWRA filed at Superior Court a Complaint to Vacate an Arbitration award.

### Matters Concluded:

Received an arbitration decision in favor of the MWRA.

Received an arbitration decision in favor of a Union.

Received a dismissal by the MCAD of a charge of discrimination.

Settled a Union demand for arbitration.

## LITIGATION/TRAC

**New Lawsuits** No new cases were reported in the Second Quarter of FY 2009.

### **Significant Developments**

#### Chutehall Construction Company, Ltd v. MWRA

On November 14, the Massachusetts Appeals Court issued its decision in *Chutehall Construction Co., Ltd. v. Commonwealth of Mass. and MWRA*. The Appeals Court upheld the decisions of the Superior Court and MWRA's Presiding Officer in Chutehall's Appeal of a \$10,000 Penalty Assessment Notice issued by TRAC, for discharging from a construction site de-watering operation without a permit from MWRA. Chutehall had appealed the Presiding Officer's decision to the Superior Court, pursuant to G.L. c. 30A. On appeal to the Appeals Court, Chutehall argued that TRAC should have been precluded from issuing a penalty by the sixty-day time-line for major enforcement actions in TRAC's "Enforcement Response Plan," but the Court agreed with MWRA that the time-line is an internal guideline that gives the violator no rights, TRAC had issued the PAN 77 days after the violation. The Court also found that MWRA's reliance on internal employees to serve as hearing officers does not violate due process or create an inherent bias. Chutehall has until December 4 to petition the Massachusetts SJC for review.

**Closed Cases** There was 1 case reported closed in the Second Quarter FY 2009.

#### The Chappy Corporation v. MWRA, et al

This was a construction contract dispute with Chappy Corporation with respect to various claims arising out of MWRA contract No. 6536, Ancillary Modifications 2: DITP. Chappy alleged damages, exclusive of statutory interest, of approximately \$1,750,000 against the MWRA pursuant to seven different legal theories including, but not limited to, breach of contract and intentional interference with contractual relations. MWRA, during the course of the litigation, initially entered into a joint defense and tolling agreement with American Electrical Testing (AET).

As the matter was nearing trial, a settlement between MWRA and AET relative to the claims between them was approved by the Board. That settlement, consistent with the Board's approval, was reduced to an agreement between MWRA and AET and set of cap of \$225,000 as MWRA's contribution, so long as AET contributed no less than \$150,000 and so long as the contribution split between the two parties did not require MWRA to contribute more than 60% to an overall settlement. Settlement discussions ultimately proceeded with Chappy many months later and MWRA paid \$225,000 to Chappy and AET contributed \$175,000, resulting in an approximate 56%/44% split. The settlement agreement with Chappy has been fully executed and a Stipulation of Dismissal With Prejudice has been filed with the Court.

**Subpoenas** During the Second Quarter of FY 2009, 2 subpoenas were received and 1 subpoena was pending at the end of Second Quarter FY 2009.

**Public Records**

During the Second Quarter of FY 2009, 4 new public records requests were received and 3 requests were closed at the end of Second Quarter FY 2009.

**SUMMARY OF PENDING LITIGATION MATTERS**

TYPE OF CASE/MATTER	As of Dec 2008	As of Sep 2008	As of Jun 2007
Construction/Contract/Bid Protest (other than BHP)	4	5	6
BHP Claims/Contract Cases	0	0	0
Tort/Labor/Employment	8	8	8
Environmental/Regulatory/Other	2	2	2
Eminent Domain/Real Estate	2	2	2
<b>total – all defensive cases</b>	<b>16</b>	<b>17</b>	<b>18</b>
Affirmative Cases:	1	1	1
<u>MWRA v. (current employee)</u>			
Other Litigation matters (restraining orders, etc.)	1	1	2
<u>MWRA v. (former employee)</u>			
<b>total – all pending lawsuits</b>	<b>18</b>	<b>19</b>	<b>21</b>
Significant claims not in suit:	1	1	1
CDM Walnut Hill			
Bankruptcy	2	2	2
Wage Garnishment	7	7	7
TRAC Appeals	5	3	3
Subpoenas	2	1	2
Public Records Requests	4	10	13
<b>TOTAL - ALL LITIGATION MATTERS</b>	<b>39</b>	<b>43</b>	<b>49</b>

**TRAC****New Appeals:**

Three new appeals were received in the 2nd Quarter FY 2009.

My Grandma's Coffecake, 08-02

The Forsyth Dental Center, 08-03

LHO Backstreet Lessee, LLC d/b/a The Westin Copley Place; 08-04

**Settlement by Agreement of Parties**

One case was settled by Agreement of Parties in 2<sup>nd</sup> Quarter FY 2009.

Brigham & Women's Hospital; 07-09

**Tentative Decision**

One Tentative Decision was issued in 2<sup>nd</sup> Quarter FY 2009.

Offset Prep, Inc. 07-08

**Final Decisions**

One Final Decision was issued during the 2<sup>nd</sup> Quarter FY 2009.

Offset Prep, Inc. 07-08

## INTERNAL AUDIT DEPARTMENT 2nd Quarter FY09

### Highlighted Audit Reports

#### CONSULTANT INCURRED COST (Issued: Dec 16, 2008)

This audit reviewed \$447,373 in billings on one MWRA and one BWSC CSO contract from November 2005 through July 2008. A total of \$154,182 is due from the consultant because hourly rates billed generally exceeded the hourly rates paid employees and final indirect cost rates were lower than the rates billed and paid.

#### CONSULTANT INCURRED COST (Issued: Dec 17, 2008)

This audit reviewed \$1,322,315 in billings on one Town of Brookline CSO contract from November 2006 through August 2008. A total of \$144,491 is due from the consultant because final indirect cost rates were lower than the rates billed and paid, and because of unallowable mark-ups on other direct costs, including sub-consultants.

#### VENDOR AUDIT (Issued: Dec 16, 2008)

This audit reviewed \$1,567,848 in billings by a MWRA plumbing supply vendor from January 2005 through April 2008. A total of \$56,855 is due from the vendor primarily as a result of the vendor billing a 25% mark-up on manufacturer's prices for miscellaneous plumbing supplies, rather than the 20% allowed in the contract.

### Status of Open Audit Recommendations

The Internal Audit Department follows up on open recommendations on a continuous basis. All pending recommendations have target implementation dates and Internal Audit has implemented a tracking system that automatically notifies the responsible managers 30 days prior to the target implementation date. When a recommendation has not been acted on in 48 months the appropriateness of the recommendation is re-evaluated during a subsequent audit. On closed assignments 79% of recommendations have been implemented.

Report Title (date)	Pending Implementation	Closed Recommendations
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
Infiltration & Inflow and Local Pipeline Programs (7/31/08)	3	7
Audit of Buying Practices (9/15/08)	4	7
<b>Total Recommendations</b>	<b>20</b>	<b>57</b>

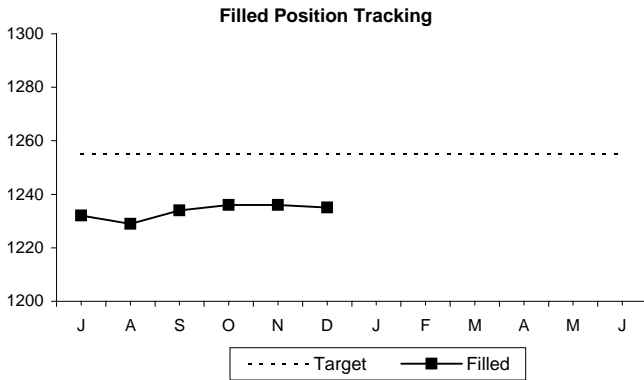
### Audit Savings

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 include the dollar impact, if measurable, of internal assignments.

Savings	FY05	FY06	FY07	FY08	FY09 2Q	TOTAL
Consultants	\$483,968	\$768,394	\$358,341	\$55,901	\$188,518	\$1,855,122
Contractors & Vendors	\$1,551,139	\$456,968	\$637,378	\$2,147,311	\$941,773	\$5,734,569
Internal Audits			\$183,840		\$349,413	\$533,253
<b>Total</b>	<b>\$2,035,107</b>	<b>\$1,225,362</b>	<b>\$1,179,559</b>	<b>\$2,203,212</b>	<b>\$1,479,704</b>	<b>\$8,122,944</b>

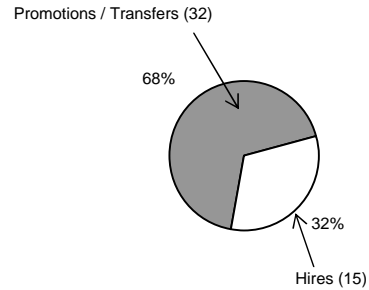
## OTHER MANAGEMENT

## Workforce Management 2nd Quarter - FY09



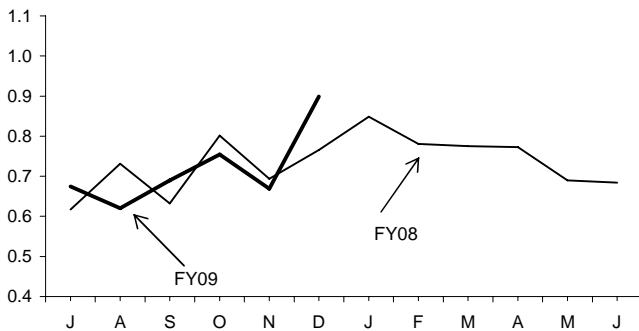
FY09 Target for Filled Positions = 1255  
 Filled Positions as of December 2008 = 1235

### Positions Filled by Hires/Promotions FY09



	Pr/Trns	Hires	Total
FY06	41 (65%)	22 (35%)	63
FY07	52 (56%)	41(44%)	93
FY08	63 (62%)	39(38%)	99

### Average Monthly Sick Leave Usage Per Employee



On an annualized basis, sick time usage through the 2nd Quarter is 8.61 days, which is slightly lower than in FY08.

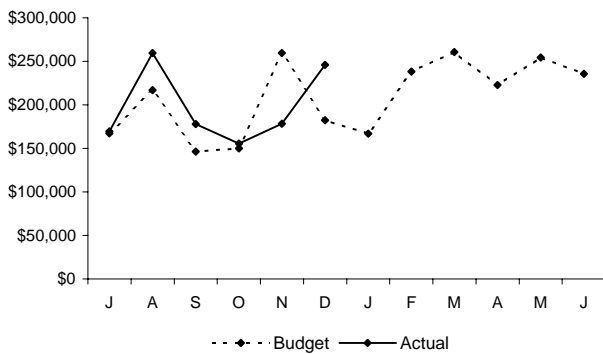
In FY09, the average monthly sick leave usage has increased 1.54% from the same time last year.

	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY08
Law	19	4.70	9.41	38.8%	8.73
Planning	24	3.94	7.89	17.8%	6.91
Operations	957	4.48	8.96	25.4%	8.94
Support	192	3.55	7.10	14.4%	8.46
Finance	43	4.04	8.09	31.9%	8.64
Executive	7	2.82	5.63	0.0%	5.18
<b>MWRA Avg</b>	<b>1242</b>	<b>4.31</b>	<b>8.61</b>	<b>24.2%</b>	<b>8.79</b>

Percent of sick leave usage attributable to Family and Medical Leave Act (FMLA) leave is 24.2% ending December 31, 2008.

### Field Operations

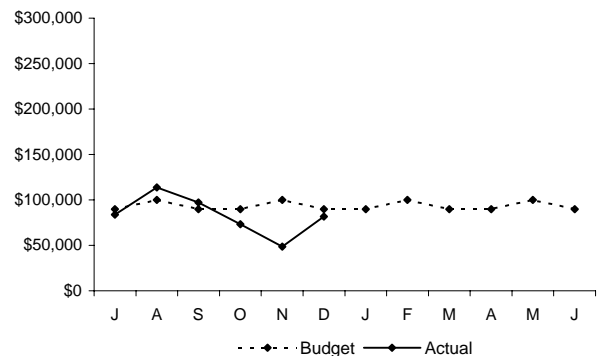
Overtime Expenditure Variance



Field Operations overtime spending overall in the second quarter was \$13,000 (2.1%) less than budgeted, reflecting management efforts to curtail planned overtime. Overspending in December reflects wet weather coverage.

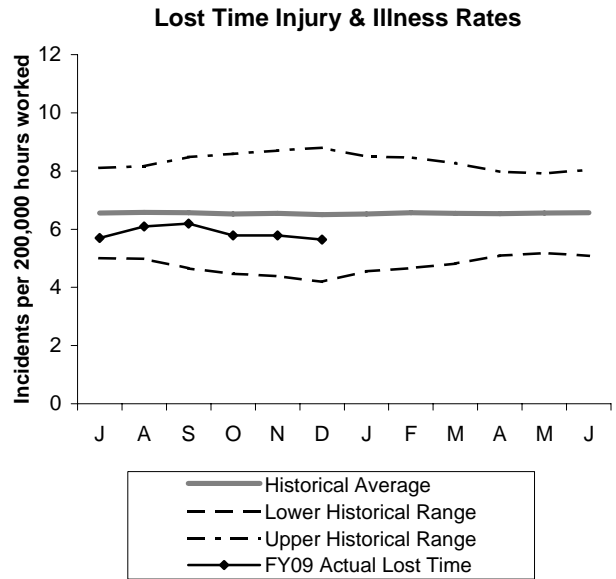
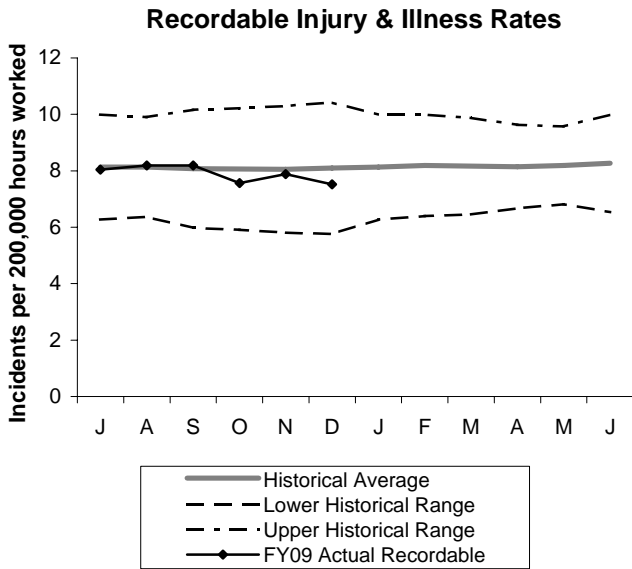
### Deer Island Treatment Plant

Overtime Expenditure Variance



Deer Island overtime spending overall in the second quarter was \$76,000 (27.3%) less than budgeted, primarily reflecting management efforts to limit maintenance overtime spending to critical equipment and emergency repairs.

## Workplace Safety 2nd Quarter FY09



- 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 FY08. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively. FY09 actual incident rates can be expected to fall within this historical range.

### Workers Compensation Claims Highlights

	New	Closed	Open Claims
Lost Time	5	17	52
Medical Only	14	35	26
	New		YTD Returns
Light Duty Returns	1		3

#### Returns:

Six employees returned to regular duty during the second quarter.

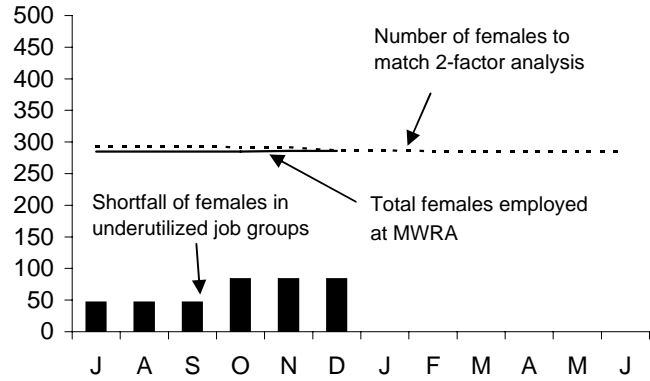
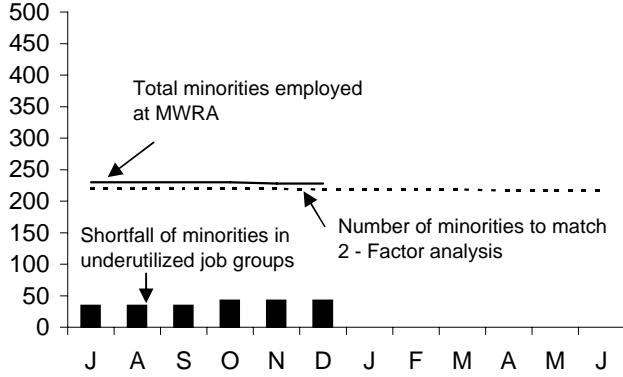
One employee returned to light duty at the DITP Warehouse in October.



## MWRA Job Group Representation Quarter 2, FY 2009

### Female - Affirmative Action Plan

#### Minority - Affirmative Action Plan Goals



#### Highlights:

At the end of Q2 FY09, 9 job groups or a total of 42 positions are underutilized by minorities as compared to 9 job groups or a total of 38 at the end of Q2 FY08; for females 11 job groups or a total of 83 positions are underutilized by females as compared to 9 job groups or a total of 49 at the end of Q2 FY08. During Q2, 0 minorities and 0 females were hired. During this same period, 2 minorities and 0 females terminated.

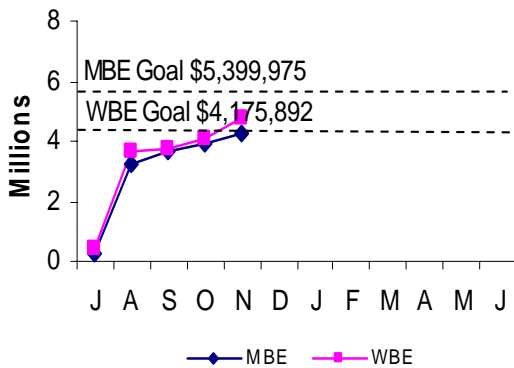
#### Underutilized Job Groups - Workforce Representation

Job Group	Employees	Minorities	Achievement Level	Minority	Females	Achievement Level	Female
	as of 12/31/2008	as of 12/31/2008		Over or Under Under utilized	As of 12/31/2008		Over or Under Under utilized
Administrator A	19	3	1	2	3	4	-1
Administrator B	25	0	4	-4	6	7	-1
Clerical A	51	23	10	13	45	12	33
Clerical B	42	8	10	-2	17	3	14
Engineer A	86	16	11	5	13	11	2
Engineer B	51	9	5	4	6	18	-12
Craft A	120	15	21	-6	0	8	-8
Craft B	149	27	18	9	4	7	-3
Laborer	64	15	10	5	5	8	-3
Management A	104	17	20	-3	32	39	-7
Management B	57	9	12	-3	13	27	-14
Operator A	69	5	7	-2	2	2	0
Operator B	74	9	10	-1	4	3	1
Para Professional	62	10	27	-17	28	53	-25
Professional A	38	2	6	-4	24	9	15
Professional B	172	41	28	13	77	76	1
Technical A	46	15	10	5	3	11	-8
Technical B	14	4	3	1	4	5	-1
<b>Total</b>	<b>1243</b>	<b>228</b>	<b>213</b>	<b>57/-42</b>	<b>286</b>	<b>303</b>	<b>66/-83</b>

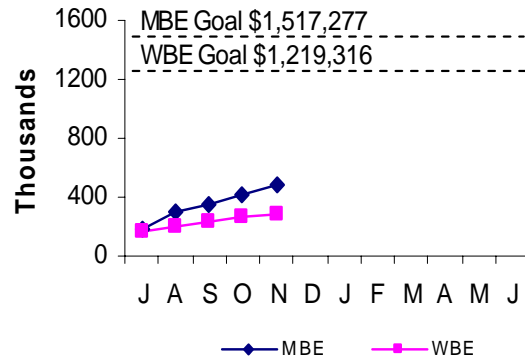
## MBE/WBE Expenditures Second Quarter 2008

**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 November.

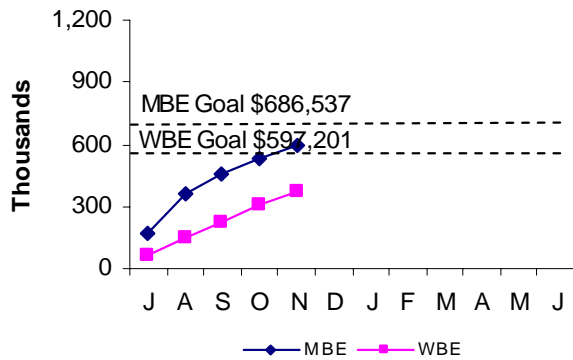
### Construction



### Professional



### Goods/Services



FY09 spending and percentage of goals achieved, as well as FY08 performance are as follows:

	MBE				WBE			
	FY09 Year-to-Date		FY08		FY09 Year-to-Date		FY08	
	<u>Amount</u>	<u>Percent</u>	<u>Amount</u>	<u>Percent</u>	<u>Amount</u>	<u>Percent</u>	<u>Amount</u>	<u>Percent</u>
Construction	4,236,911	78.5%	13,681,272	144.8%	4,761,963	114.0%	9,999,226	212.8%
Professional Svc.	479,930	31.6%	1,867,312	118.3%	280,945	23.0%	863,795	68.1%
Goods & Svcs.	597,260	87.0%	1,523,765	266.1%	370,240	62.0%	627,752	126.0%
<b>Total</b>	<b>\$5,314,101</b>	<b>69.9%</b>	<b>\$17,072,349</b>	<b>147.1%</b>	<b>\$5,413,148</b>	<b>90.3%</b>	<b>\$11,490,773</b>	<b>177.7%</b>

## MWRA FY09 CEB Expenses through December 2008

	December 2008 Year-to-Date					
	Period 6 YTD Budget	Period 6 YTD Actual	Period 6 YTD Variance	%	FY09 Approved	% Expended
<b>EXPENSES</b>						
WAGES AND SALARIES	\$ 44,128,224	\$ 42,989,740	\$ (1,138,484)	-2.6%	\$ 90,676,105	47.4%
OVERTIME	1,825,163	1,804,450	(20,713)	-1.1%	3,906,671	46.2%
FRINGE BENEFITS	8,219,771	8,204,467	(15,304)	-0.2%	16,462,542	49.8%
WORKERS' COMPENSATION	662,500	937,740	275,240	41.5%	1,325,000	70.8%
CHEMICALS	4,962,548	5,169,927	207,379	4.2%	9,876,380	52.3%
ENERGY AND UTILITIES	14,514,532	13,072,798	(1,441,733)	-9.9%	29,724,532	44.0%
MAINTENANCE	13,340,641	12,959,535	(381,106)	-2.9%	28,089,127	46.1%
TRAINING AND MEETINGS	142,503	110,389	(32,114)	-22.5%	290,913	37.9%
PROFESSIONAL SERVICES	3,775,830	3,259,870	(515,960)	-13.7%	7,252,264	44.9%
OTHER MATERIALS	1,893,816	2,217,102	323,285	17.1%	5,170,041	42.9%
OTHER SERVICES	11,654,194	11,405,302	(248,892)	-2.1%	23,145,528	49.3%
<b>TOTAL DIRECT EXPENSES</b>	<b>\$ 105,119,722</b>	<b>\$ 102,131,320</b>	<b>\$ (2,988,400)</b>	<b>-2.8%</b>	<b>\$ 215,919,103</b>	<b>47.3%</b>
INSURANCE	\$ 1,225,000	\$ 963,667	\$ (261,333)	-21.3%	\$ 2,450,000	39.3%
WATERSHED/PILOT	11,541,693	11,456,726	(84,967)	-0.7%	23,083,385	49.6%
BEC <sub>o</sub> PAYMENT	2,008,542	2,097,100	88,558	4.4%	4,161,027	50.4%
MITIGATION	722,618	710,726	(11,892)	-1.6%	1,445,236	49.2%
ADDITIONS TO RESERVES	1,395,252	1,395,252	-	0.0%	2,790,504	50.0%
RETIREMENT FUND	9,249,730	5,953,424	(3,296,306)	-35.6%	11,906,836	50.0%
<b>TOTAL INDIRECT EXPENSES</b>	<b>\$ 26,142,835</b>	<b>\$ 22,576,895</b>	<b>\$ (3,565,940)</b>	<b>-13.6%</b>	<b>\$ 45,836,988</b>	<b>49.3%</b>
DEBT SERVICE	\$ 161,447,336	\$ 154,313,197	\$ (7,134,139)	-4.4%	\$ 328,779,671	46.9%
DEBT SERVICE ASSISTANCE	(5,625,002)	-	5,625,002	-100.0%	(11,250,000)	0.0%
<b>TOTAL DEBT SERVICE</b>	<b>\$ 155,822,334</b>	<b>\$ 154,313,197</b>	<b>\$ (1,509,137)</b>	<b>-1.0%</b>	<b>\$ 317,529,671</b>	<b>48.6%</b>
<b>TOTAL EXPENSES</b>	<b>\$ 287,084,891</b>	<b>\$ 279,021,412</b>	<b>\$ (8,063,477)</b>	<b>-2.8%</b>	<b>\$ 579,285,762</b>	<b>48.2%</b>
<b>REVENUE &amp; INCOME</b>						
RATE REVENUE	\$ 270,409,500	\$ 270,409,500	\$ -	0.0%	\$ 540,819,000	50.0%
OTHER USER CHARGES	3,819,248	3,415,440	(403,809)	-10.6%	7,576,985	45.1%
OTHER REVENUE	3,093,431	4,444,255	1,350,824	43.7%	5,389,387	82.5%
RATE STABILIZATION	2,536,683	2,536,683	-	0.0%	5,073,363	50.0%
INVESTMENT INCOME	9,608,091	10,757,689	1,149,598	12.0%	20,427,025	52.7%
<b>TOTAL REVENUE &amp; INCOME</b>	<b>\$ 289,466,953</b>	<b>\$ 291,563,567</b>	<b>\$ 2,096,613</b>	<b>0.7%</b>	<b>\$ 579,285,762</b>	<b>50.3%</b>

Through December 2008, total revenue was \$291.6 million, \$2.1 million or 0.7% more than budgeted. Total expenses were \$279.0 million, \$8.1 million or 2.8% less than budgeted.

Expenses –

- **Direct Expenses** totaled \$102.1 million, \$3.0 million or 2.8% less than budgeted.
- **Energy and Utilities** are \$1.4 million or 9.9% less than budgeted: Electricity, \$747,000, due to lower pricing at DITP and lower usage in FOD; Diesel Fuel, \$577,000, due to lower pricing at DITP and lower usage in FOD; and Natural Gas, \$93,000, due to lower than projected usage and pricing.
- **Wages and Salaries** are \$1.1 million or 2.6% less than budgeted as a result of lower regular pay due to fewer than budgeted filled positions.
- **Professional Services** are \$516,000 or 13.7% less than budget due to Lab and Testing Analysis, \$389,000, mainly in ENQUAD for delays in harbor and outfall reports and lower as-needed task orders; and in Engineering, \$82,000, due to delay in the use of as-needed engineering services.
- **Maintenance** is \$381,000 or 2.9% under budget due to lower spending for services of \$1.1 million of which \$615,000 is for the delay of the DITP roof replacement project, offset by higher materials of \$725,000 of which \$500,000 is due to FY08 purchases which carried over into FY09.
- **Other Materials** is \$323,000 or 17.1% more than budget mainly for Vehicle Purchases, \$184,000, and Computer Hardware, \$112,000, due to timing, offset by lower spending for Vehicle Expense, \$115,000, due to gasoline pricing.
- **Workers' Compensation** is \$275,000 or 41.5% more than budgeted due to higher Compensation Payments of \$170,000 and Medical Payments of \$116,000.
- **Indirect Expenses** are \$22.6 million, \$3.6 million or 13.6% less than budget mainly due to the decision to postpone the Pension Reserve deposit of \$3.3 million until later in the fiscal year.
- **Debt Service** totaled \$154.3 million, \$1.5 million less than budget mainly due to the effects of losing Debt Service Assistance, \$5.6 million, offset by favorable interest rates (\$3.9 million) and the delay of the budgeted October borrowing (\$2.1 million).

Revenue and Income –

- **Other Revenue** exceeded budget by \$1.4 million due to higher Emergency Water use by the Town of Wilmington, \$334,000; disposal of surplus equipment, \$256,000; receipt of an unbudgeted Homeland Security grant of \$237,000 for mobile laboratory equipment to be used for water protection; and the \$100,000 deposit on the sale of the Enterprise engines at Deer Island.
- **Investment Income** through December totaled \$10.8 million, \$1.1 million or 12.0% more than budgeted due to higher than budgeted interest rates.

## Cost of Debt December 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.

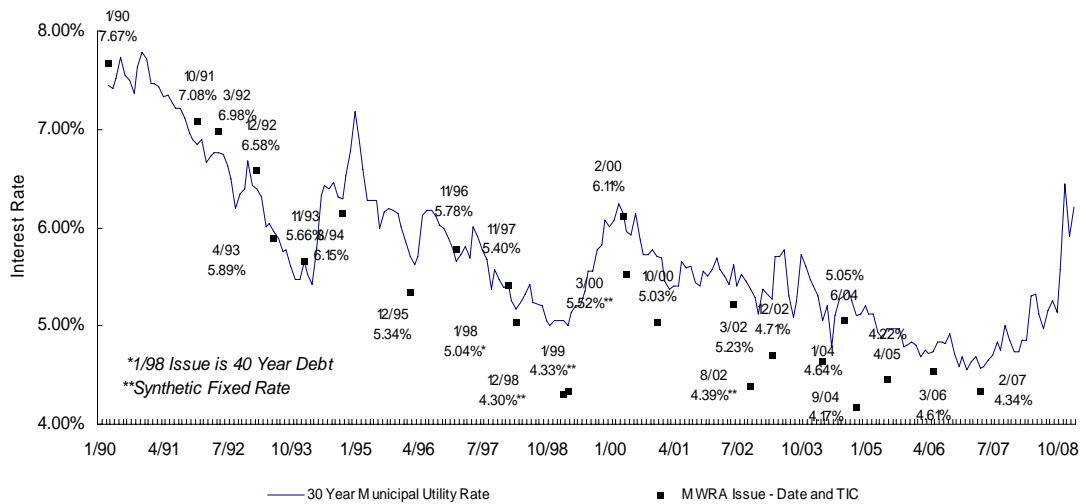
### Average Cost of MWRA Debt

Fixed Debt (\$3,802)	4.67%
Variable Debt (\$594)	2.74%
SRF Debt (\$966)	0.92%
 Weighted Average Debt Cost (\$5,394)	 3.78%

### Most Recent Senior Fixed Debt Issue February 2007

2007 Series A & B (\$848)	4.34%
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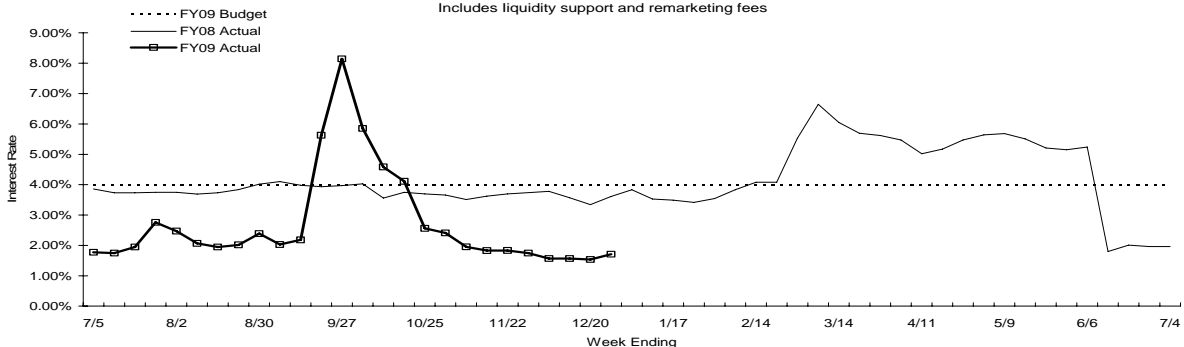
### MWRA Fixed Rate Debt vs. 30 Year Municipal Utility Interest Rate



### Weekly Average Interest Rates vs. Budget

MWRA currently has nine variable rate debt issues with \$594 million outstanding, excluding commercial paper. Of the nine outstanding series, five have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years, as short-term rates have remained lower than long-term rates on MWRA debt issues. Starting in September 2008, the short term market experienced disruption caused by a market-wide credit crisis which pushed (SIFMA) Securities Industry and Financial Markets Association rates to a high of 7.96%. In December, SIFMA rates fluctuated with a high of 1.25% and a low of 0.85%. 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.

### Weekly Average Interest Rate on MWRA Variable Rate Debt Includes liquidity support and remarketing fees



## Investment Income December 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)

Fund	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	
	Average Budgeted Balance	Average Actual Balance	Variance	Impact	Budget	Actual	Impact	Impact	%
Combined Reserves	\$91,618	\$90,369	(\$1,249)	(\$32)	4.93%	5.06%	\$57	26	1.15%
Construction	\$78,808	\$41,036	(\$37,772)	(\$373)	2.00%	2.77%	\$157	-216	-27.81%
Debt Service	\$96,717	\$93,233	(\$3,485)	(\$34)	2.00%	2.73%	\$333	299	31.35%
Debt Service Reserves	\$237,831	\$240,319	\$2,488	(\$37)	3.12%	3.67%	\$730	693	18.92%
Operating	\$52,433	\$53,503	\$1,070	\$10	2.61%	2.49%	(\$28)	-18	-2.64%
Revenue	\$79,291	\$81,303	\$2,012	\$4	2.16%	2.86%	\$300	304	36.02%
Redemption	\$35,410	\$30,847	(\$4,562)	(\$45)	2.68%	3.49%	\$107	62	13.20%
<b>Total</b>	<b>\$672,107</b>	<b>\$630,610</b>	<b>(\$41,497)</b>	<b>(\$507)</b>	<b>2.90%</b>	<b>3.46%</b>	<b>\$1,657</b>	<b>1,149,600</b>	<b>12.0%</b>

### YTD Investment Income Variance

