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## WATER QUALITY UPDATE An Analysis of August 2005 Sampling Data

MASSACHUSETTS WATER RESOURCES AUTHORITY  
100 First Avenue, Charlestown Navy Yard, Boston, MA 02129



## MWRA WATER QUALITY UPDATE

### August 2005 Highlights

- **See how our water fared in a taste test with bottled water in a Boston Globe article – link available at [www.mwra.com](http://www.mwra.com).** Great tasting, cheap water without having to go to Fiji!
- **The DEP has approved a letter addressing changes to MWRA's Disinfection By-Product (DBP) Program.** Changes will be forthcoming in the September Monthly Report. DBP's have dropped over 80% with the use of ozone at the Carroll Water Treatment Plant. See Page 8.
- **MWRA achieved CT disinfection requirements for the month** at the Ware Disinfection Facility (WDF) and the Carroll Water Treatment Plant (CWTP). CT results appear on Page 5. One community violated the Total Coliform Rule criteria. See Page 7.
- **The Wachusett Reservoir was treated with copper sulfate on August 2 and 20** to control nuisance algae which cause taste and odor problems. The treatments were successful and there were no increases in taste and odor complaints related to algae. See Page 4.
- **On August 13 and 14, Carroll Water Treatment Plant shutdown due to power losses.** Each time, the plant was restarted within forty minutes. **Proper disinfection (CT) was maintained** at all times during plant flow.
- **On August 19, at Cosgrove Intake a turbine tripped which automatically shuts Carroll Water Treatment Plant flow** down as a precautionary measure. The plant restarted within thirty minutes. CT was met at all times during plant flow.
- **One hundred and twenty-five discolored water complaints were reported in August. Quincy reported twenty-five discolored water complaints** at Common and Cross Street when a 100-year old main burst on August 2. The main was repaired later that day. **Everett reported eighty discolored water complaints** when a pipeline section was shutdown as part of the MWRA Pipeline Rehabilitation Project on August 11.

**We are updating the report. Let us know if you have any ideas or comments.**

**Call (617) 242-5323 or email [Joshua.Das@mwra.state.ma.us](mailto:Joshua.Das@mwra.state.ma.us)**

**Release Date: September 20, 2005**

## Water Quality Update

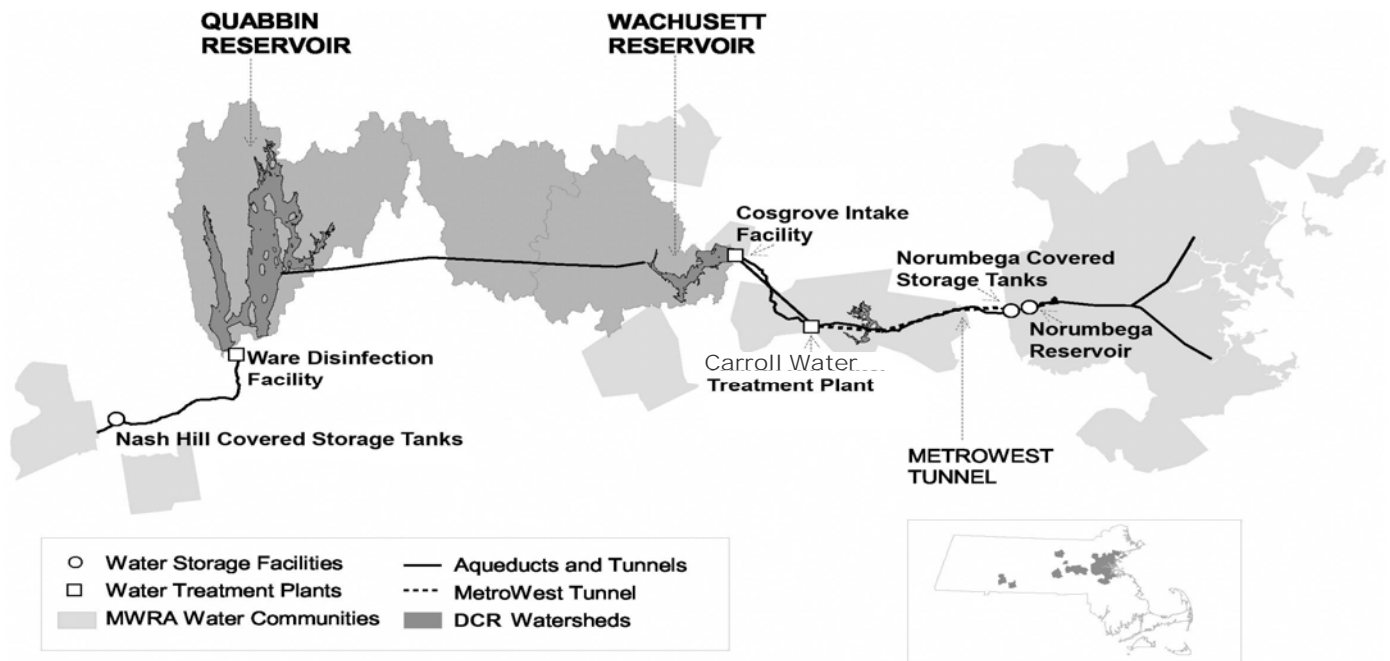
This is a monthly report containing information about the quality of water supplied by MWRA. It provides a more detailed review of water quality than the annual water quality report that is mailed each June to customers in our service area. The report is available at [www.mwra.com](http://www.mwra.com).

## The Water System

MWRA provides about 250 million gallons of water each day to 46 cities and towns in Massachusetts. Each municipality is responsible for distributing the water within its own community. More than two million people are served by the MWRA water supply system.

Quabbin Reservoir is the primary source of water for our system and one of the country's largest water supply impoundments, with a capacity of 412 billion gallons. Quabbin water represents source water for the Chicopee Valley Aqueduct (CVA) system. Water is transferred from Quabbin Reservoir to the 65 billion gallon Wachusett Reservoir in Clinton via the Quabbin Aqueduct. Wachusett water represents source water for MetroWest and Metropolitan Boston communities. The watershed areas of the Quabbin and Wachusett Reservoirs total 401 square miles. The Department of Conservation and Recreation (DCR), which manages the watersheds, and MWRA are committed to protection of the water supply through aggressive watershed protection as the first line of defense against water contamination. Three-quarters of the watersheds are protected lands and over 80% are either forest or wetlands.

The map below indicates the location of reservoirs, treatment facilities, and service communities.



## Indicators of Water Quality

Tests are conducted on water sampled at the source reservoirs (source or raw water) and also on water after treatment (treated water). MWRA routinely uses six general indicators of water quality: microbial, corrosiveness, disinfection by-products, turbidity and algae, disinfectant residual, and mineral analysis. Testing frequencies vary by parameter.

The Federal Safe Drinking Water Act (SDWA) sets standards for source and treated water quality. The standards relate to coliform, turbidity, watershed protection, disinfection and disinfection by-products, over 120 potential chemical contaminants, and waterborne disease outbreaks. MWRA monitors for these parameters on schedules ranging from daily to annually.

Customer communities must also meet certain standards under the SDWA concerning distribution of treated drinking water. The Total Coliform Rule (TCR) helps to alert communities to possible microbial contamination as well as the adequacy of residual disinfection within the local distribution system. MWRA tests over 1500 samples per month. Under the SDWA, a violation of the TCR occurs when greater than 5% of the samples in a community are positive for total coliform during a month.

# Source Water – Microbial Results

## August 2005

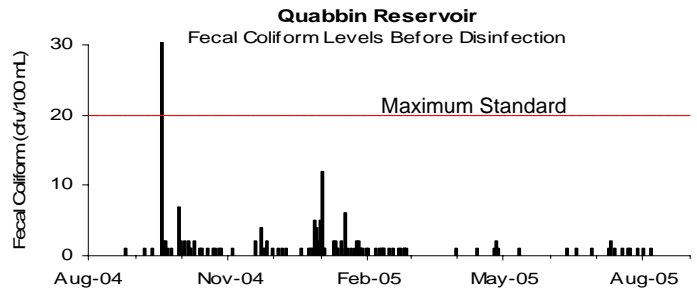
### Source Water - Microbial Results

Total coliform bacteria are monitored in both source and treated water to provide an indication of overall bacteriological activity. Most coliforms are harmless. 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 supplies requires that no more than 10% of source water samples prior to disinfection over any six-month period have more than 20 fecal coliforms per 100ml.

#### Sample Site: Quabbin Reservoir

Quabbin Reservoir water is sampled at the Ware Disinfection Facility (WDF) raw water tap before entering the CVA system. MWRA met the six-month running average standard for fecal coliform continuously at this location over the last year.

One of the 31 samples was positive during August. The sample did not exceed a count of 20 cfu/100ml.

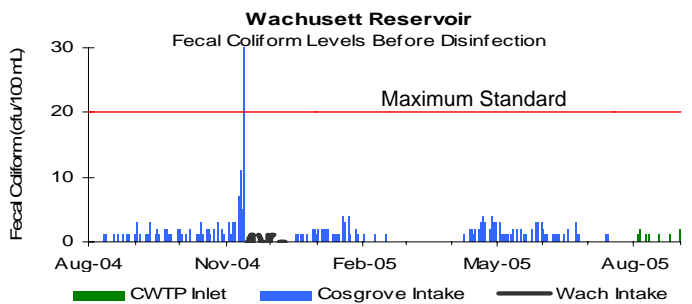


#### Sample Site: Wachusett Reservoir

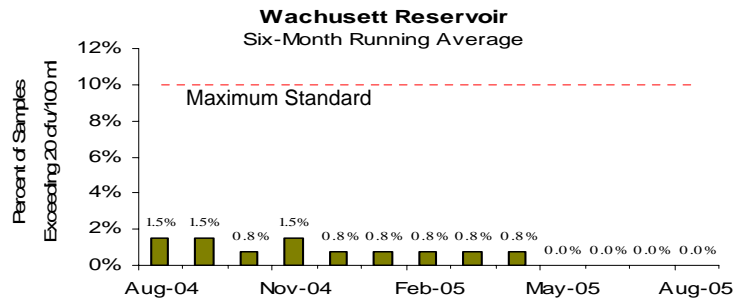
Wachusett Reservoir water is sampled before it enters the MetroWest and Metropolitan Boston systems at the Carroll Water Treatment Plant raw water tap in Marlborough.

Fecal coliform levels tend to increase during the winter because, when water bodies near Wachusett ice over, waterfowl seek open water. Many roost at Wachusett, which tends to freeze later in the year than smaller ponds nearby.

Seven of the 23 samples were positive during August. None of the the samples exceeded a count of 20 cfu/100ml.

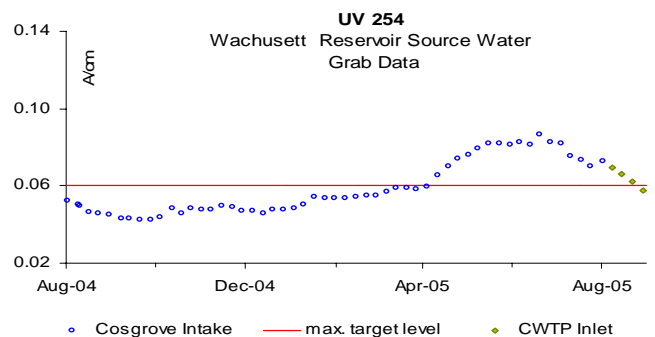


For the current six-month period, 0.0% of the samples have exceeded a count of 20 cfu/100ml



### UV

UV-254 is a surrogate measure of reactive organic matter. Regulated DBP levels have dropped to very low levels with Carroll Water Treatment Plant coming on-line. But UV-254 levels remain useful for estimating ozone dosage and serving as a trigger for Quabbin transfer consideration. Levels are currently around 0.058 A/cm.

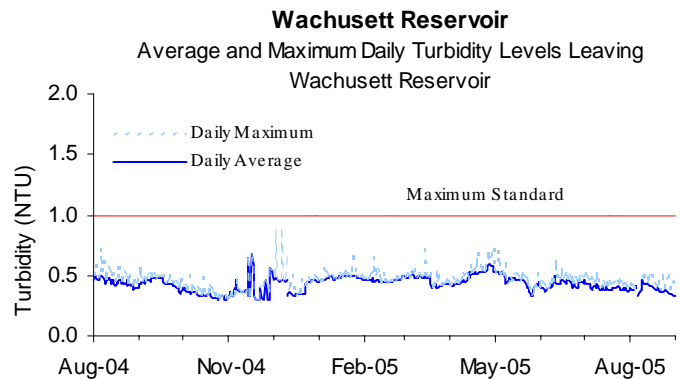
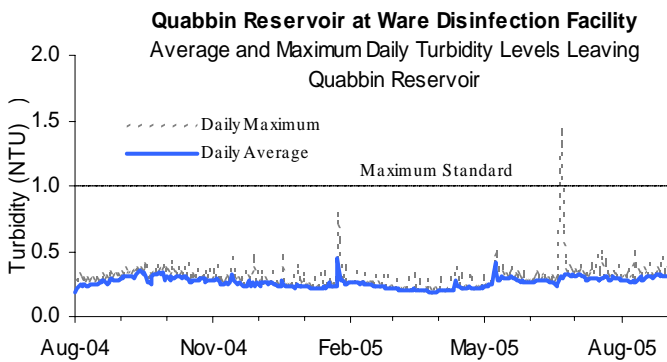


# Source Water – Turbidity and Algae Results August 2005

## Source Water – Turbidity Results

Turbidity is a measure of suspended and colloidal particles including clay, silt, organic and inorganic matter, algae and microorganisms. The effects of turbidity depend on the nature of the matter that causes the turbidity. High levels of particulate matter may have a higher chlorine demand or may protect bacteria from the disinfectant effects of chlorine, thereby interfering with the disinfectant residual throughout the distribution system.

Samples for turbidity from Quabbin Reservoir are collected at the Ware Disinfection Facility before chlorination. Samples from Wachusett Reservoir were taken at Wachusett Intake before chlorination from November 1, 2003 to March 16, 2004, October 26, 2004 and November 13, 2004 to December 10, 2004. Otherwise, samples were taken at the Cosgrove Intake before chlorination. As part of the new facility start-up and debugging process, the source water compliance monitoring location for turbidity remained at the Cosgrove Intake through August 5, 2005. Beginning on August 6, the source water compliance monitoring location was shifted to the CWTP inlet (raw water line). The Massachusetts Department of Environmental Protection standard for source water turbidity for unfiltered water supply systems is a maximum of 1.0 NTU; the EPA standard is a maximum of 5.0 NTU. Maximum turbidity results at Quabbin and Wachusett were within DEP standards for the month.

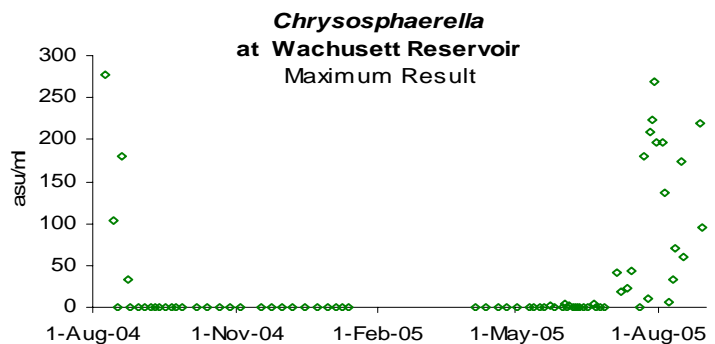
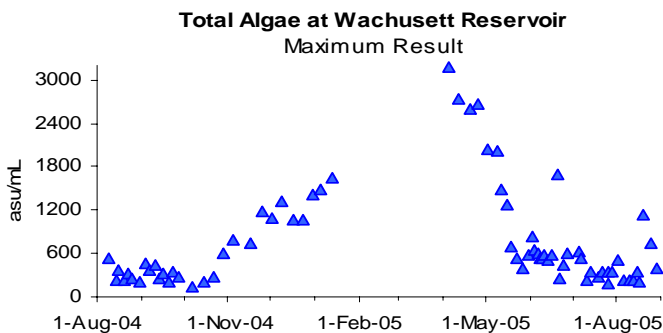


## Source Water – Algae Results

Algal levels in reservoirs 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. Most taste and odor complaints at the tap are 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 blooms, MWRA may treat the reservoir with copper sulfate, an algaecide.

The Wachusett Reservoir was treated with copper sulfate on August 2 to control the growth of *Chryso-sphaerella*, a taste and odor causing algae species. The reservoir was treated with copper sulfate again on August 20 when levels of *Chryso-sphaerella* started to increase. Since the activation of the new treatment plant, algae related taste and odor complaints appear to have declined. With observed levels of *Chryso-sphaerella* this month, many more complaints would have been expected.

Of the 121 water quality complaints received during August from local water departments, 9 concerned taste and odor that may be due to the algae.



# Treated Water – Disinfection, pH and Alkalinity Results

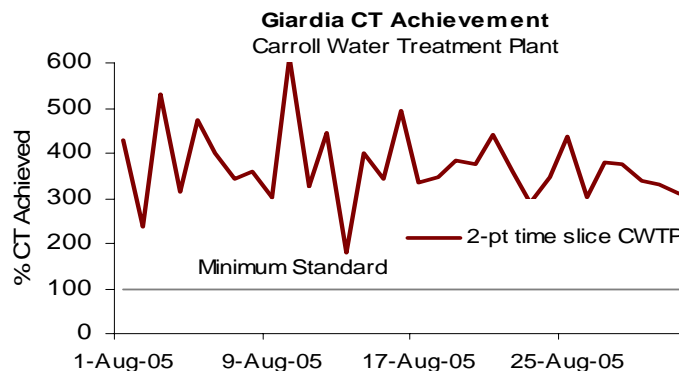
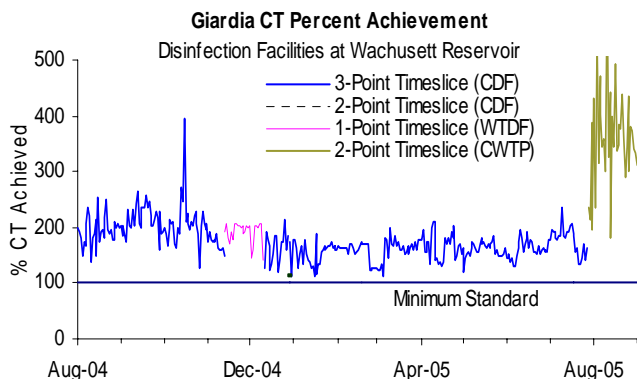
## August 2005

### Treated Water - Primary Disinfection

MWRA provides disinfection adequate to achieve EPA's requirement of 99.9% inactivation of *Giardia* cysts and 99.99% inactivation of viruses in drinking water using a calculation based on three sample points that DEP approved in June, 1999. Depending on the number of sample points that are providing accurate information, CT may be reported on one, two or three points. CT achievement for *Giardia* assures CT achievement for viruses, which have a lower CT requirement. The concentration (C) of the disinfectant in the water over time (T) yields a measure of the effectiveness of disinfection, CT. The required CT varies with disinfectant type, water temperature, pH, and other factors. MWRA calculates daily CT inactivation rates at maximum flow, as specified by EPA regulations.

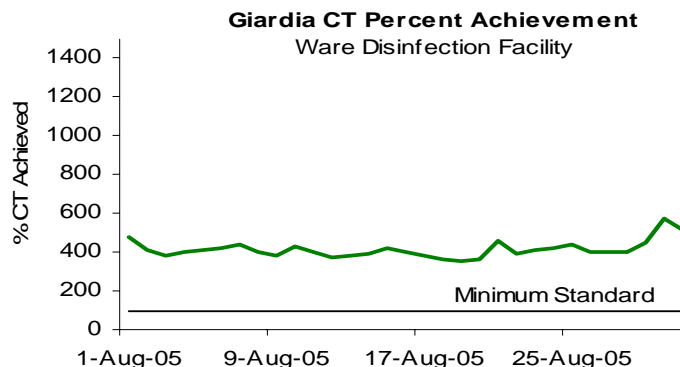
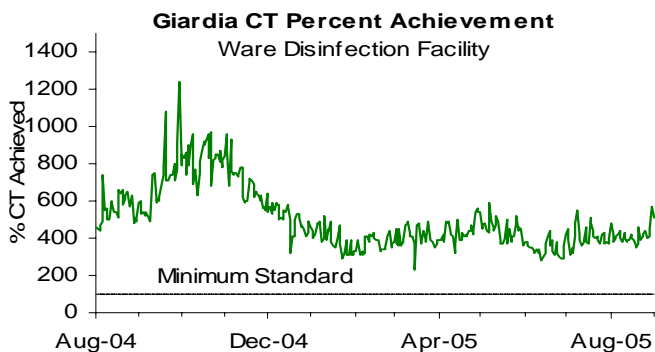
### Wachusett Reservoir - MetroBoston Supply:

The new ozone treatment now provides inactivation for *Cryptosporidium*, and this is measured through Performance Ratio (PR). PR was maintained above 1, the target level, at all times the plant was providing water into the distribution system. Ozone dose at the Carroll Water Treatment Plant (CWTP) varied between 1.8 to 2.7 mg/L. CT was met each day in August, as well as every day for the last year.



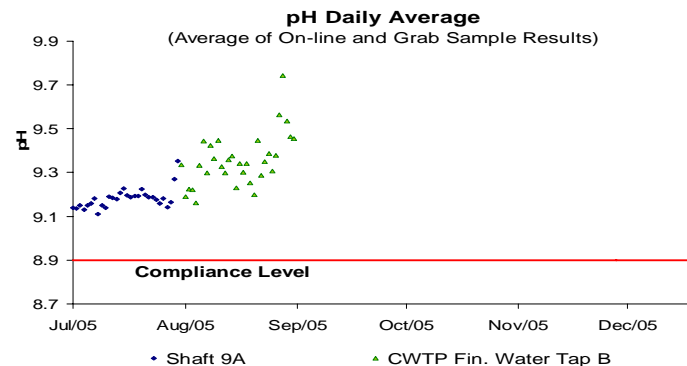
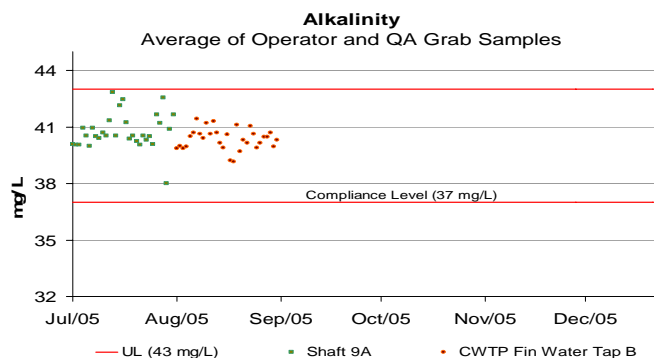
### Quabbin Reservoir at Ware Disinfection Facility (CVA Supply):

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



## Treated Water – pH and Alkalinity Compliance

MWRA adjusts the alkalinity and pH of Wachusett water to reduce its corrosivity in order to minimize the leaching of lead and copper from service lines and home plumbing systems into the water. MWRA's target for distribution system pH is 9.1 and alkalinity is 40 mg/l. Beginning January 1, 2005, as per DEP requirements, samples from Shaft 9A have a minimum compliance level of 8.9 for pH and 37 mg/L for alkalinity. Beginning July 28, 2005, the compliance monitoring location was shifted to the Carroll Water Treatment Plant Finished Water Tap B site. Samples from 27 community taps have a minimum compliance level of 8.8 for pH and 37 mg/L for alkalinity. For no more than nine days in a six-month period may results be below these levels. Quality Assurance and operator staff test pH and alkalinity daily at Shaft 9A. Community samples are collected on a quarterly basis. Four communities had samples tested for pH on July 29 to August 2 as part of the monitoring program for the startup the Carroll Water Treatment Plant. In August, no sample results were below the target levels. The Community pH samples ranged from 9.2 to 9.4.



### Community Requirements

Minimum Level for *pH* = 8.8

Minimum Level for *Alkalinity* = 37 mg/L

		PARAMETERS	
DATE	SAMPLE SITE ADDRESS/ LOCATION	PH* (S.U)	ALKALINITY (MG/L)
1-Aug	Boston Fire Station, 1940 Centre Street, West Roxbury	9.4	NS
1-Aug	Boston, 59 Fenway, Texaco Station	9.3	NS
1-Aug	Boston, 9 Gallivan Boulevard, Dorchester	9.4	NS
1-Aug	Boston, Government Center Fire Station, 200 Cambridge St.	9.3	NS
2-Aug	Boston Fire Station, 1940 Centre Street, West Roxbury	9.4	NS
2-Aug	Boston, 9 Gallivan Boulevard, Dorchester	9.2	NS
Number of Days of Excursion (July 1, 2005 to December 31, 2005)			
Date of Excursion		Number of Days with Excursions	
N/A		None	None
Total Number of Days with Excursion		N/A	

\* = Average of duplicate results

NS= No Sample Taken

## Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program August 2005

While all communities collect bacteria samples for the Total Coliform Rule (TCR), 37 systems (including Deer Island and Westboro State Hospital) use the 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 9 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 141 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 the MWRA transmission system, water storage tanks and pumping stations.

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

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

### Highlights

Three of the 1,894 community samples (0.16%) system-wide tested positive for confirmed total coliform during the month of August. Northborough failed the TCR for August. Eleven of the 674 MWRA samples (1.63%) tested positive for confirmed total coliform. No samples tested positive for *E. coli*. All thirty-seven systems that submitted chlorine residual data maintained an average disinfectant residual of at least 0.2 mg/L. 3.4% of the system samples had a disinfectant residual lower than 0.2 mg/L.

A database error incorrectly reported one confirmed total coliform for Wellesley in the TCR for July. Wellesley had no positive results for July. The database has been corrected.

TCR results by Community								
Town	Samples Tested for Coliform (a)	Total Coliform # (%) Positive	E.coli % Positive	Public Notification Required?	August 2005 Minimum Chlorine Residual (mg/L)	August 2004 Minimum Chlorine Residual (mg/L)	August 2005 Average Chlorine Residual (mg/L)	August 2004 Average Chlorine Residual (mg/L)
ARLINGTON	55	0 (0%)			0.01	0.01	0.52	0.45
BELMONT	40	0 (0%)			0.04	0.13	0.92	0.94
BOSTON	266	0 (0%)			0.10	0.20	1.24	1.07
BROOKLINE	85	0 (0%)			0.47	0.61	1.50	1.33
CHELSEA	40	0 (0%)			0.43	0.24	1.18	1.06
DEER ISLAND	20	0 (0%)			0.34	0.23	1.12	1.09
EVERETT	50	0 (0%)			0.02	0.31	0.78	0.75
FRAMINGHAM (c)	73	0 (0%)			0.08	0.19	1.07	1.10
LEXINGTON	45	0 (0%)			0.21	0.10	1.42	1.10
LYNNFIELD	6	0 (0%)			0.75	0.37	1.23	0.69
MALDEN	75	0 (0%)			0.87	0.70	1.02	0.86
MARBLEHEAD	24	0 (0%)			0.27	0.24	1.15	0.95
MARLBOROUGH (b)(c)	53	0 (0%)			0.09	0.08	1.15	1.15
MEDFORD	68	0 (0%)			0.29	0.11	1.09	0.96
MELROSE	45	0 (0%)			0.03	0.03	0.66	0.37
MILTON	24	0 (0%)			0.15	0.20	0.92	0.95
NAHANT	10	0 (0%)			0.07	0.29	0.71	0.66
NEEDHAM (b)	51	0 (0%)			0.05	0.03	0.83	0.59
NEWTON	88	0 (0%)			0.08	0.14	1.27	1.20
NORTHBOROUGH	26	3 (11.54%)		yes	0.06	0.30	0.59	1.29
NORWOOD	36	0 (0%)			0.01	0.02	0.65	0.62
QUINCY	115	0 (0%)			0.01	0.06	1.04	0.91
REVERE	52	0 (0%)			0.25	0.47	1.16	1.11
SAUGUS	40	0 (0%)			1.14	0.98	1.25	1.13
SOMERVILLE	100	0 (0%)			0.01	0.01	1.14	0.84
SOUTHBOROUGH (c)	10	0 (0%)			0.12	0.15	0.79	0.75
STONEHAM	28	0 (0%)			0.65	0.16	1.37	1.20
SWAMPSCOTT	18	0 (0%)			0.20	0.24	0.77	0.78
WAKEFIELD (b)	44	0 (0%)			0.32	0.13	0.86	0.70
WALTHAM	85	0 (0%)			0.01	0.01	0.98	0.95
WATERTOWN	40	0 (0%)			0.08	0.25	0.89	0.89
WELLESLEY (b)	37	0 (0%)			0.07	0.07	0.59	0.47
WESTBORO HOSPITAL	5	0 (0%)			0.29	0.07	1.13	0.37
WESTON (c)	16	0 (0%)			0.04	0.01	1.15	0.68
WINCHESTER (b)	25	0 (0%)			0.05	0.11	0.58	0.47
WINTHROP	24	0 (0%)			0.20	0.21	1.12	0.96
WOBURN (b)	75	0 (0%)			0.19	0.07	0.90	0.64
Total:	1894	3(0.16%)						
MASS. WATER RESOURCES AUTHORITY (d)	674	11 (1.63%)		no	0.01	0.01	1.26	1.08

(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) These communities locally chloraminate.

(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 - Disinfection By-Product (DBP) Levels in Communities

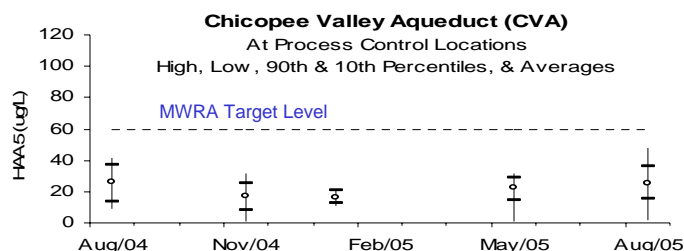
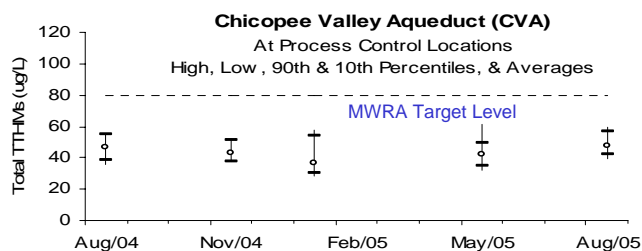
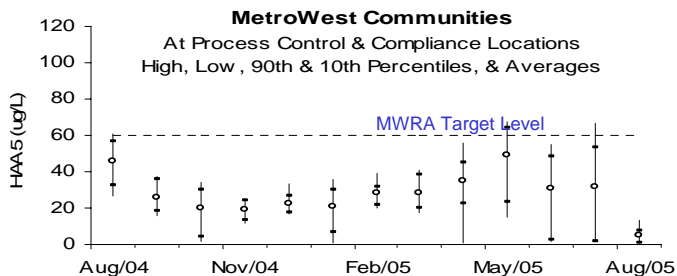
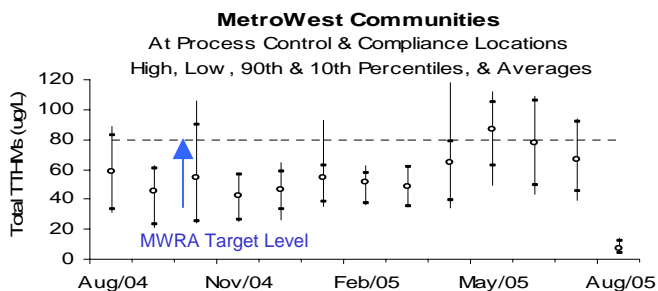
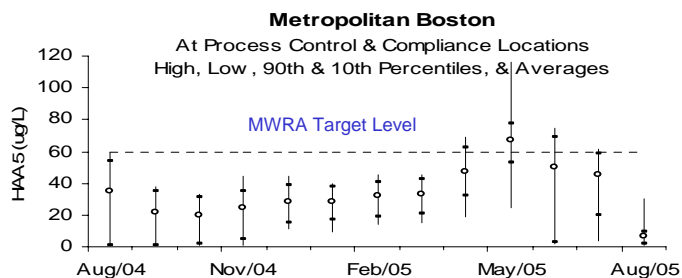
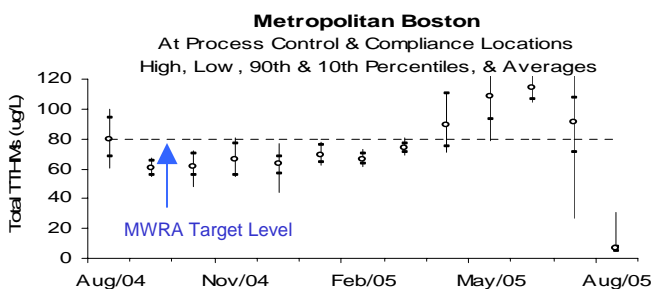
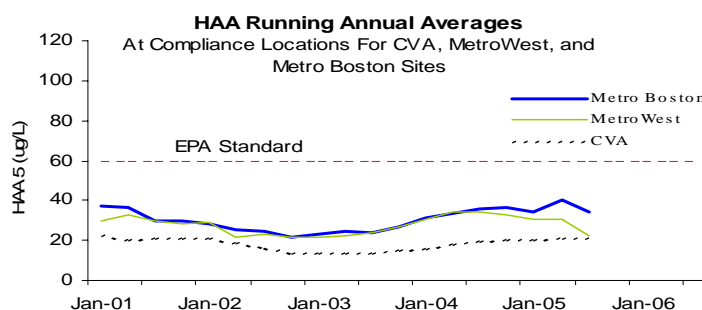
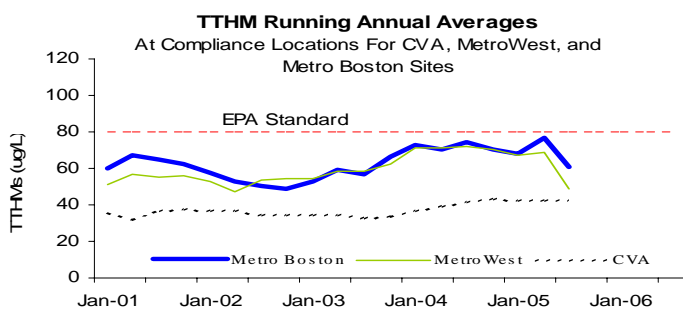
## August 2005

Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAAs) are by-products of disinfection treatment with chlorine. Chlorination levels, the presence of organic precursors, pH levels, the contact time of water with chlorine used for disinfection, and temperature all affect TTHM and HAA levels. DBPs are of concern due to their potential adverse health effects at high levels. EPA's running annual average standards are 80 ug/L for TTHMs and 60 ug/L for HAA5. DEP requires that compliance samples be collected quarterly. MWRA samples more frequently at some locations. **Metro Boston numbers from the fully-served communities are used for compliance purposes.** Individual CVA and MetroWest communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their results. The DEP has approved consolidating MetroWest and Metropolitan Boston programs since MWRA now provides fully treated water to both. Changes will be forthcoming in the September Monthly Report.

The running annual average for TTHMs and HAA5s at compliance locations, represented in the top two graphs below, remained below current standards. Average monthly HAA5 and TTHM levels at all sampling locations for the MetroWest and Metropolitan Boston communities are lower than those of last year. **With the activation of the Carroll Water Treatment Plant on July 28, the DBP levels have dropped dramatically in the MetroWest and Metropolitan Boston systems.**

### TOTAL TRIHALOMETHANES

### HALOACETIC ACIDS





# MWRA Monthly Water Quality Analysis

## August 2005

This page provides information on water quality at five locations in the MWRA transmission system. Results reflect a "snapshot" in time and may not represent typical conditions. Monitoring for parameters indicated in bold is quarterly as they either have minimal variability or are always below detection limits. The "Wachusett System" locations represent: raw water from the Wachusett Reservoir (CWTP inlet), finished water leaving the treatment plant (CWTP Finished water tap), and a location at an endpoint in the main transmission system (Shaft 9A, Malden). The CWTP Finished water tap replaces the former locations ICC, Marlboro and Comm. Ave., Newton which represented intermediate treatment points. All treatment has now been consolidated at the new CWTP.

### CVA System | Wachusett System → | Standards →

Component	Quabbin Res. at Ware Disinfection Facility (Raw)	Ludlow Monitoring Station (Treated)	Carroll Water TP Inlet (Raw) <sup>1</sup>	Carroll Water TP Fin. Water Tap (Treated) <sup>1</sup>	Shaft 9A, Malden (Treated)	Standard	Units	Exceedance
Alkalinity	2.6	3.4	5.4	39.4	38.2		MG/L	
Aluminum	< 15.0	< 15.0	16.4	NS	20.6	50-200 (e)	UG/L	NO
Ammonia-N	0.01	0.01	0.03	0.25	0.35		MG/L	
Antimony	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	6 (a)	UG/L	NO
Arsenic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50 (a)	UG/L	NO
Barium	6.4	6.4	8.7	8.5	8.7	2000 (a)	UG/L	NO
Beryllium	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	4 (a)	UG/L	NO
Bromate	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	10 (a)	UG/L	NO
Bromide	9.4	4.3	16.5	17.7	17.8		UG/L	
Cadmium	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5 (a)	UG/L	NO
Calcium	2100	2160	4170	4150	4350		UG/L	
Chloride	7.9	9.2	22.4	24.2	24.0	250 (e)	MG/L	NO
Chlorine, Free	NS	0.75	NS	0.04	NS	4 (c)(d)	MG/L	NO
Chlorine, Total	NS	NS	NS	2.0	1.6	4 (c)(d)	MG/L	NO
Chromium	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	100 (a)	UG/L	NO
Coliform, Fecal, MF Method	0	NS	1	NS	NS	20 (b)	CFU/100 mL	NO
Coliform, Total, MF Method (h)	1	0	4	0	0	100 (b) 0 (c)	CFU/100 mL	NO
Copper **	< 3.0	< 3.0	6.3	4.2	6.6	1300 (f) 1000 (g)	UG/L	NO
Cyanide	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.2 (a)	MG/L	NO
Fluoride	< 0.02	< 0.02	0.05	0.06 <sup>2</sup>	0.04 <sup>2</sup>	4 (a)	MG/L	NO
Hardness	7.3	7.4	13.7	13.7	14.2		MG/L	
Iron **	6.6	< 6.0	33.3	35.8	38.1	300 (e)	UG/L	NO
Lead	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	15 (a)	UG/L	NO
Magnesium	497	494	811	802	815		UG/L	
Manganese	2.7	2.4	4.8	4.8	5.5	50 (e)	UG/L	NO
Mercury	< 0.010	< 0.010	NS	< 0.010	< 0.010	2 (a)	UG/L	NO
Nickel	< 5.0	< 5.0	NS	< 5.0	< 5.0		UG/L	
Nitrate-N	< 0.005	< 0.005	0.084	0.087	0.808	10 (a)	MG/L	NO
Nitrate/Nitrite	< 0.005	< 0.005	0.088	0.088	0.130			
Nitrite	< 0.005	< 0.005	< 0.005	0.091	< 0.005	1 (a)	MG/L	NO
Orthophosphate	< 0.003	< 0.003	0.004	0.012	0.012		MG/L	
pH	7.2	7.0	6.6	9.3	9.3		S.U.	
Potassium	554	624	914	995	1080		UG/L	
Selenium	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50 (a)	UG/L	NO
Silica (SiO2)	1960	2020	2620	2500	2740		UG/L	
Silver	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	100 (e)	UG/L	NO
Sodium	4.9	5.9	12.5	28.2	28.1		MG/L	
Specific Conductance	49	54	111	181	199		UMHO/cm	
Standard Plate Count, HPC (48 Hrs @ 35C)	NS	NS	535	2	19	500 (c)	CFU/mL	NO
Sulfate (SO4)	5.0	5.0	6.6	6.6	6.7	250 (e)	MG/L	NO
Thallium	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2 (a)	UG/L	NO
Total Dissolved Solids	38	43	79	106	110	500 (d)	MG/L	NO
Total Organic Carbon	2.2	2.1	3.2	3.5	3.9		MG/L	
Total Phosphorus	< 0.005	< 0.005	0.014	0.011	0.006		MG/L	
UV-254	0.027	0.020	0.069	0.033	0.037		A	
Zinc **	3.3	3.1	< 1.5	< 1.5	1.7	5000 (e)	UG/L	NO

- (a) = Primary MCL standard (health related). DEP "Drinking Water Regulations", 310CMR 22.00.
- (b) = Primary MCL standard (health related), applies to source (raw) water only. DEP "Drinking Water Regulations", 310CMR 22.00.
- (c) = Primary MCL standard (health related). DEP "Drinking Water Regulations", 310CMR 22.00. Applies to samples of treated water downstream of Wachusett and Quabbin Reservoirs.
- (d) = Maximum Residual Disinfectant Level. DEP "Drinking Water Regulations", 310CMR 22.00.
- (e) = Secondary MCL standard (aesthetic related). DEP "Drinking Water Regulations", 310CMR 22.00.
- (f) - Refers to 90th percentile Action Level
- (g) - Refers to a single sample, secondary MCL
- (h) - Confirmed results only are reported

MCL = Maximum Contaminant Level  
 CFU = Colony Forming Unit  
 S.U. = Standard Units  
 UG/L = micrograms per liter = parts per billion

NS = No sample  
 NTU = Nephelometric Turbidity Unit  
 MG/L = milligrams per liter = parts per million  
 < = less than method detection limit

HPC = Heterotrophic Plate Count  
 Inv Res = Invalid sample result  
 \*\* = Metal results may be elevated due to local plumbing at the sample tap.  
**Bold Italics = Quarterly Samples**

Most results are based on single grab samples collected on August 8 and 15, 2005 and analyzed by MWRA and contract laboratories.

**NOTE:** MWRA tests for cadmium and mercury are more sensitive than the EPA-set levels of detection and reporting. For cadmium any level below 1.0 ug/L and for mercury any level below 0.2 ug/L are under the EPA minimum detection limits. MWRA will continue to report any result below these detection limits here in the monthly report but will follow EPA reporting requirements and not report them in the EPA-regulated annual Consumer Confidence Report.

- (1) Quarterly data for the Carroll Water Treatment Plant Inlet is from Cosgrove Intake sampling performed in July. Quarterly data for the Carroll Water Treatment Plant Finished Water Tap is from Commonwealth Avenue, Newton sampling performed in July.
- (2) Carroll Water Treatment Plant fluoride addition was shutdown on July 29, 2005 due to a blockage of the chemical feed line. The line was repaired and reactivated on 8/16/2005. The sample results reflect the shut down.