



MASSACHUSETTS WATER RESOURCES AUTHORITY

WATER QUALITY UPDATE

An Analysis of November 2002 Sampling Data

This is a monthly report containing information about the quality of water supplied by MWRA. We hope this report is useful to you as a local water supplier, public health official, water consumer or observer of MWRA's system performance. It provides a more detailed review of water quality than the annual water quality report that is mailed each June to every customer in our service area. To view this annual report, please visit www.mwra.com/water/html/awqr.htm.

Indicators of Water Quality

MWRA routinely uses six general indicators of water quality:

- Microbial
- Corrosiveness (pH and alkalinity)
- Disinfection By-Products
- Turbidity & Algae
- Disinfectant Residual
- Mineral Analysis

Tests are conducted on water sampled at the source reservoirs (source or raw water) and also on water after treatment that is sampled from MWRA or community lines (treated water). A map on Page 2 indicates the location of reservoirs, treatment facilities, and service communities. Testing frequencies vary by parameter. The following pages contain information on all of the above indicators.

November 2002 Highlights

•**MWRA achieved CT disinfection requirements for the month** at both Ware Disinfection Facility (WDF) and Cosgrove Disinfection Facility (CDF). Chlorine dose at CDF remained at 1.6 mg/L. Dose at Ware Disinfection Facility remained at 1.2 mg/L. Dose at Norumbega remained at 1.6 mg/L. Levels of disinfection by-products (DBPs) were slightly lower than those in October for the CVA, MetroWest and Metropolitan communities. CT results appear on Page 5. No towns violated the Total Coliform Rule criteria. See Page 6. DBP results appear on Page 7.

•**Bird harassment and observation at Wachusett Reservoir was initiated on the 17th.** MDC staff continued activities that included weekend shifts, weekend harassment about 2 hours before sunset, and observation and harassment Monday through Friday from 8 AM to 3:00 PM. Boat-based harassment has been effective in keeping waterfowl away from Cosgrove Intake. Fecal coliform numbers at Cosgrove are higher than normal, but are below the standard of 20 cfu/ 100mL. See Page 3 for details.

•**On the 20th, a leak occurred on a 70 year old 48" steel main** at the intersection of River Street and Memorial Drive in Cambridge. MWRA staff worked diligently to isolate the leak, shutdown the main valve and look for an alternate water source supply while the main was finally repaired on the 23rd. The alternate water source was the Loring Road Covered Storage Facility Tanks which had been drained, flushed, disinfected, filled and tested negative for bacterial growth the previous week. The tanks were activated on the 21st.

•**On the 22nd, a break in a 100 year old 16" cast iron main by the Fox Hill Bridge in Lynn** flooded Route 107 and adjacent property. The water main was shutdown. Mass. Highway Department (MHD) repaired the road. At the request of the MHD, MWRA staff will excavate and repair the the pipeline after the first of the new year when the traffic volume is lower.

•**Good News on Lead Levels:** MWRA is now in compliance with the Lead and Copper Rule, with lead and copper results below Action Levels for the required two consecutive sampling rounds. With the good results in September, ten years of corrosion control effort appear to have finally paid off with public health improvements. For more information, see page 9.

For more information, please contact MWRA at (617) 242-5323, or visit www.mwra.com

100 First Avenue, Charlestown Navy Yard, Boston, MA 02129.

*For further information regarding health concerns, please contact
the Department of Public Health/Division of Epidemiology at (617) 983-6800
or Boston Public Health Commission at (617) 534-5611.*

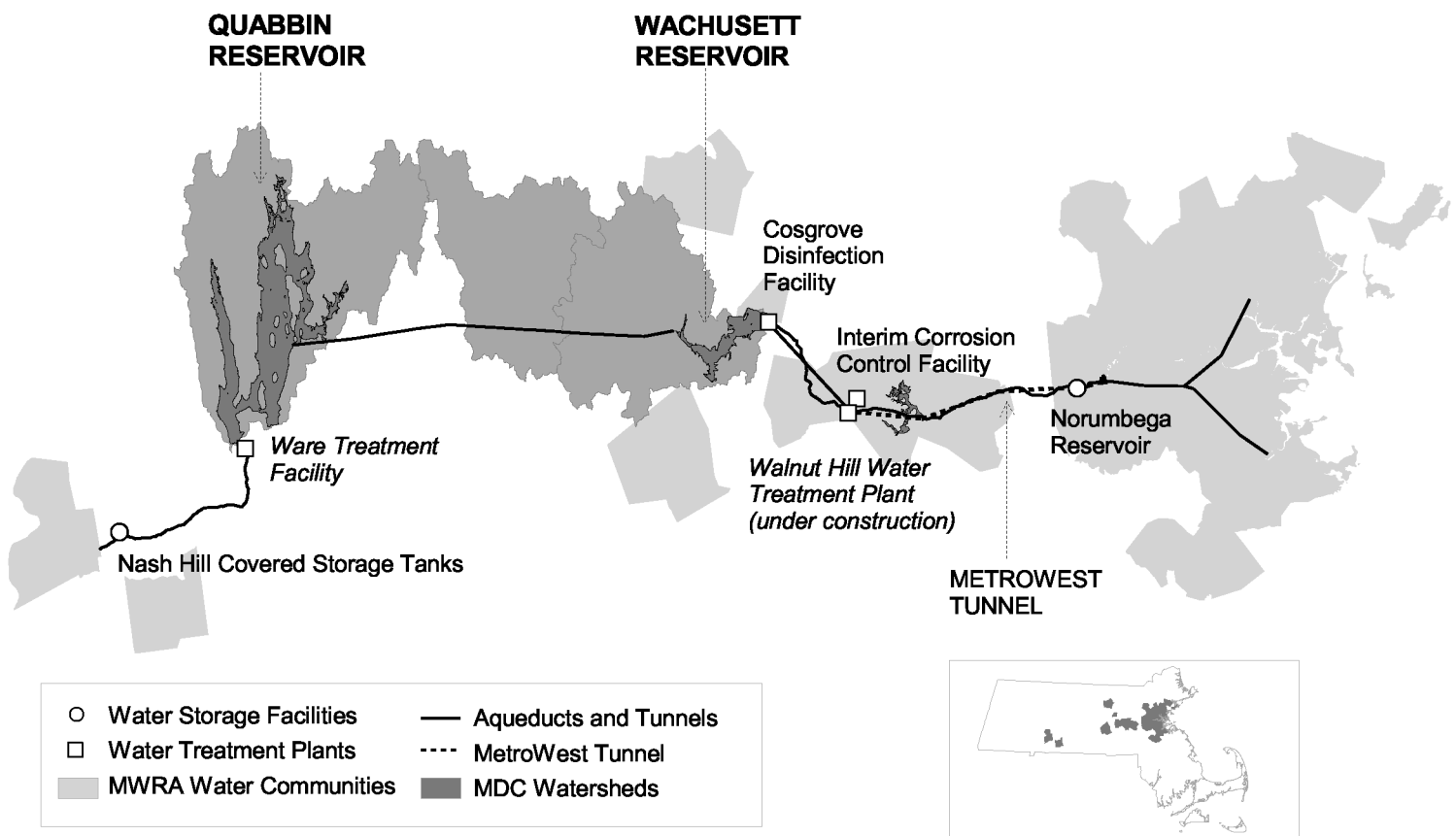
Release Date: December 20, 2002

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. Thirty of the customer communities are fully supplied by MWRA. The other communities use MWRA water to augment their own supplies, either on a regular basis or in times of water shortage. 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, serving South Hadley Fire District #1, Chicopee, and Wilbraham. 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 Metropolitan District Commission (MDC), 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.



Federal Safe Drinking Water Act (SDWA)

The 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 provides testing services for many of the communities, and 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. This MWRA/ Wachusett system is also subject to the TCR requirements.

Source Water – Microbial Results

November 2002

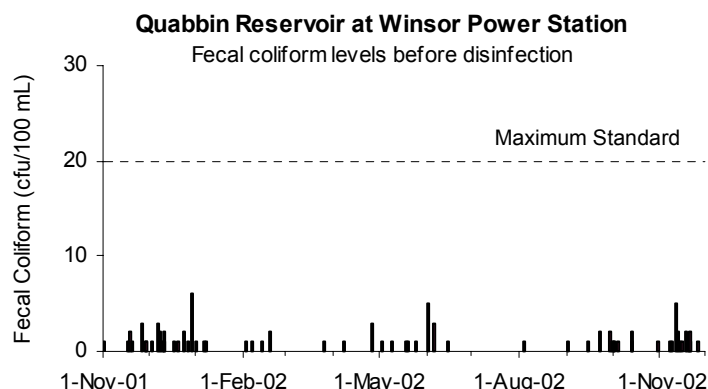
Source Water - Microbial Results

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 is a subclass of the coliform group which 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 over 20 fecal coliforms per 100ml.

Sample Site: Quabbin Reservoir

Quabbin Reservoir water is sampled at Winsor Dam before entering the CVA system. MWRA met the six-month running average standard for fecal coliform continuously at this location over the last year.

Eleven of the 30 samples was positive during November. Colony counts were in the single digits.

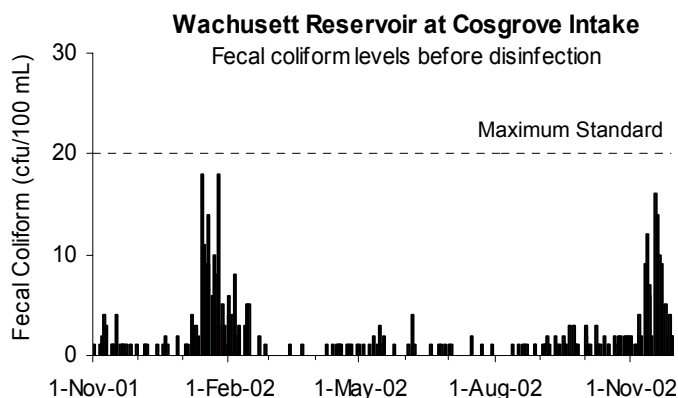


Sample Site: Wachusett Reservoir

Wachusett Reservoir water is sampled at Cosgrove Intake before entering the MetroWest and Metropolitan Boston systems. MWRA met the six-month running average standard for fecal coliform continuously at this location over the last year.

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. MDC has an active bird harassment program to move the birds away from the intake area.

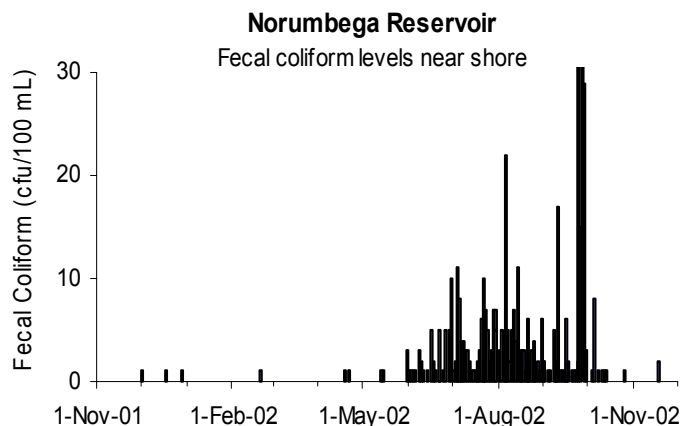
21 of 21 samples were positive for fecal coliform. Colony counts did not exceed the standard of 20 cfu/100 ml.



Sample Site: Norumbega Reservoir

Norumbega Reservoir in Weston receives flows from Wachusett for temporary storage each day during low demand hours, which are then discharged during high demand. Norumbega water is sampled from the shore near the gatehouse before disinfection. Coliform levels are elevated periodically, partly because samples collected from the shore of this small reservoir are more susceptible to local disturbances. Covered storage is scheduled to replace this open reservoir in 2004.

1 of 30 samples from water taken along the shore were positive for fecal coliform during November. Colony count was in the single digits.

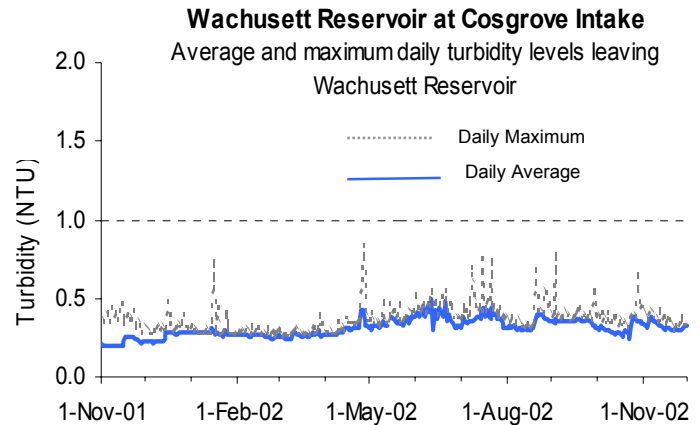
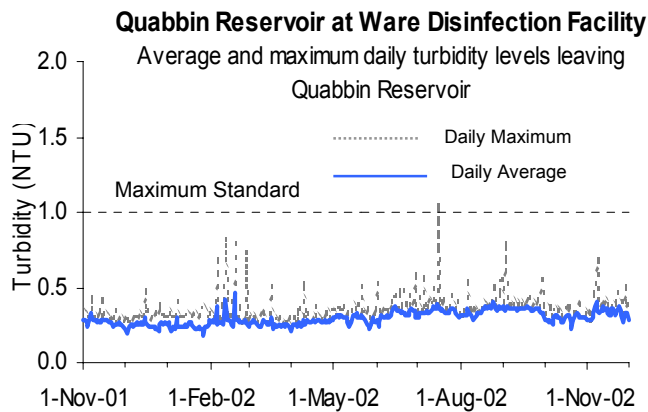


Source Water – Turbidity and Algae Results November 2002

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.

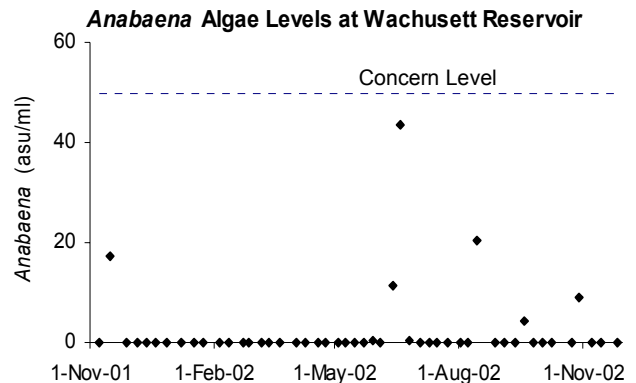
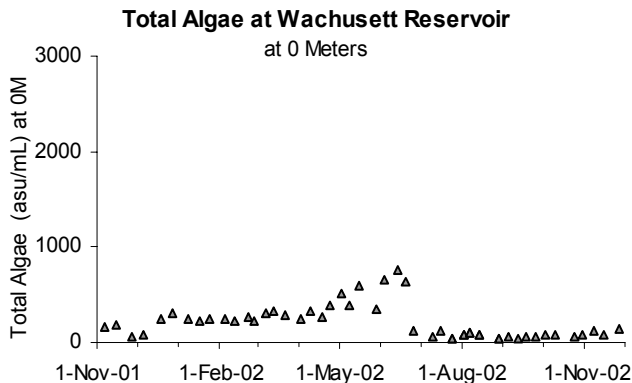
Samples for turbidity from Quabbin Reservoir are collected at the Ware Disinfection Facility before chlorination. These samples represent reservoir water entering the CVA system. Samples are also taken at Cosgrove Intake, representing water quality before chlorination for source water serving the MetroWest and Metropolitan Boston systems. 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 Reservoir and at Wachusett Reservoir were within DEP standards for the month.



Source Water – Algae Results

Algal levels in reservoirs are monitored by MDC 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 treats the reservoirs with copper sulfate, an algaecide. Of 79 complaints received during November from local water departments, only 3 concerned taste and odor that may be due to algae.



Treated Water – Disinfection and pH Results

November 2002

Treated Water - Primary Disinfection

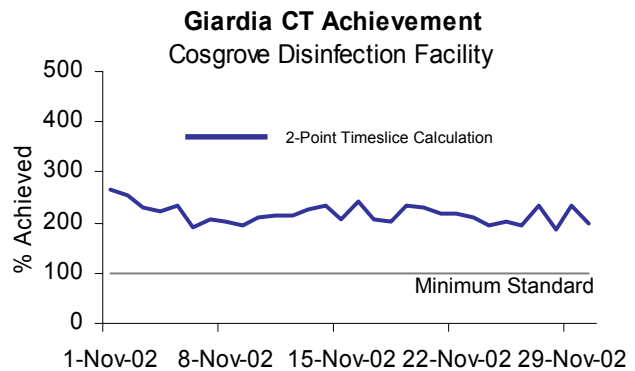
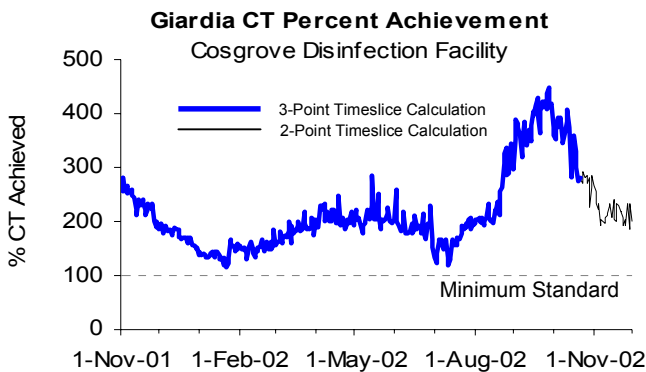
Wachusett Reservoir at Cosgrove Disinfection Facility (MetroBoston Supply):

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. The two-point timeslice, three-point timeslice, or integrated methods are alternative calculation methods which can also be used to comply with CT regulations.

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.

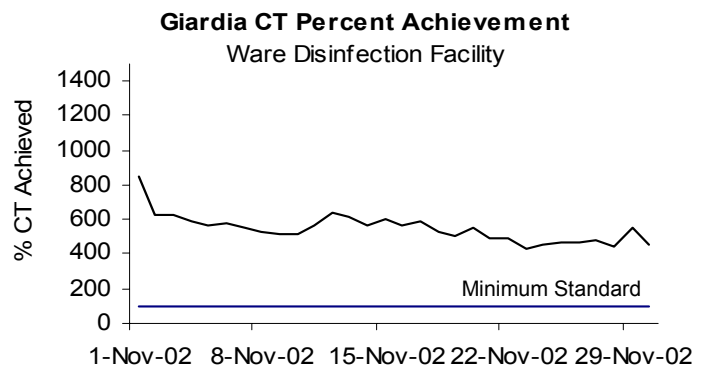
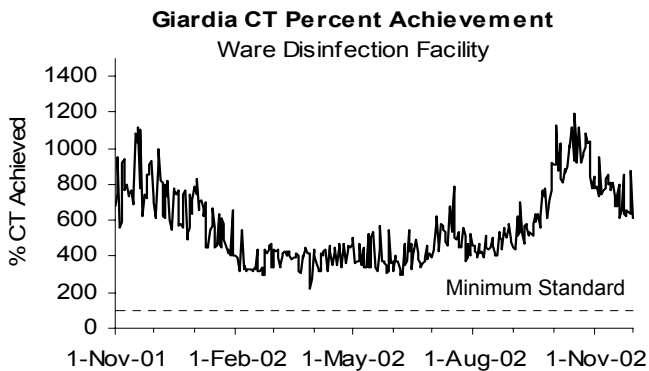
On October 22, 2002, a sample pump at Shaft A failed, depriving MWRA of sample results necessary to calculate the three-point timeslice. The two-point method remained the best available measure of CT compliance approved by DEP. The sample pump is to be replaced in the summer of 2003.

Chlorine dose remained at 1.6 mg/L. CT was met each day in November, as well as every day for the last year.



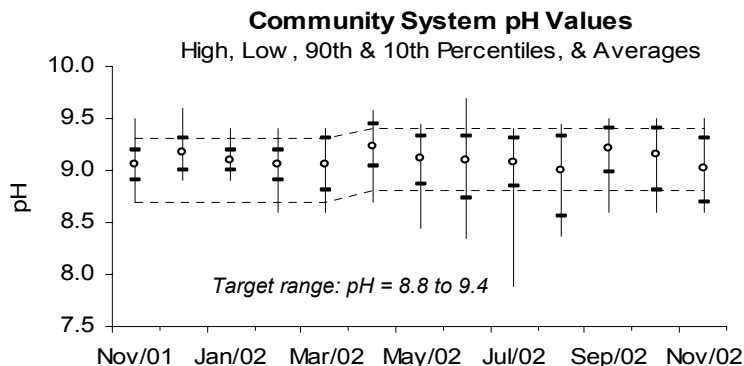
Quabbin Reservoir at Ware Disinfection Facility (CVA Supply):

Chlorine dose remained at 1.2 mg/L. CT was met each day in November, as well as every day for the last year.



Treated Water – pH Results

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 was raised from 9.0 to 9.1 on March 25th per DEP. Upper and lower target bands were adjusted to 8.8 and 9.4: MWRA's goal is to have all distribution system samples fall between these targets. MWRA staff collects and analyzes samples for pH from 26 community locations on a biweekly schedule to measure pH levels. In November, about 83% of the samples were within the target range.



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

November 2002

Background

While all communities collect bacteria samples for the Total Coliform Rule (TCR), 36 cities and towns (including Westboro State Hospital) use the MWRA Laboratory for Total Coliform Rule compliance testing. These communities collect samples for bacteriological analysis and measure water temperature and chlorine residual at the time of collection. Cambridge conducts their own monitoring. The other 9 MWRA customer communities have their samples tested elsewhere and these towns should be contacted directly for their monthly results.

There are 144 sampling locations for which the MWRA is required to report TCR results. This includes a subset of the community TCR locations as well as sites along the MWRA transmission system, water storage tanks and pumping stations.

The SDWA requires that no more than 5% of all samples may be total coliform positive in a month (or that no more than 1 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

None of the 1666 community samples (0.00% system-wide) tested positive for confirmed total coliform during the month of November. 2 of 638 MWRA samples tested positive for confirmed total coliform. No samples tested positive for *E. coli*. No towns failed the TCR rule for the month.

All thirty-six communities that submitted chlorine residual data maintained an average disinfectant residual of at least 0.2 mg/L. 2.3% of the community samples had a disinfectant residual lower than 0.2 mg/L.

TCR results by Community								
Town	Samples Tested for Coliform (a)	Total Coliform # (%) Positive	E.coli % Positive	Public Notification Required?	October 2002 Minimum Chlorine Residual (mg/L)	October 2001 Minimum Chlorine Residual (mg/L)	October 2002 Average Chlorine Residual (mg/L)	October 2001 Average Chlorine Residual (mg/L)
ARLINGTON	55	0 (0%)			0.06	0.06	0.83	1.16
BELMONT	32	0 (0%)			0.04	0.20	0.85	0.98
BOSTON	224	0 (0%)			0.65	0.71	1.34	1.72
BROOKLINE	68	0 (0%)			0.96	0.30	1.51	1.46
CHELSEA	32	0 (0%)			0.36	0.43	1.26	1.39
EVERETT	40	0 (0%)			0.51	1.10	1.10	1.58
FRAMINGHAM (c)	72	0 (0%)			0.48	0.10	1.34	1.43
LEXINGTON	36	0 (0%)			0.43	1.17	1.40	1.72
LYNNFIELD	6	0 (0%)			0.17	0.31	0.63	0.92
MALDEN	60	0 (0%)			0.07	0.07	0.99	1.16
MARBLEHEAD	24	0 (0%)			0.24	0.33	1.16	1.35
MARLBOROUGH (b)(c)	60	0 (0%)			0.68	0.15	1.37	1.57
MEDFORD	68	0 (0%)			0.11	0.30	0.93	1.27
MELROSE	36	0 (0%)			0.03	0.10	0.60	1.29
MILTON	32	0 (0%)			0.01	0.78	1.08	1.32
NAHANT	10	0 (0%)			0.06	0.03	0.82	1.01
NEEDHAM (b)	41	0 (0%)			0.07	0.04	0.77	1.20
NEWTON	88	0 (0%)			1.02	0.61	1.43	1.46
NORTHBOROUGH	13	0 (0%)			0.56	0.75	1.54	1.70
NORWOOD	36	0 (0%)			0.01	0.05	0.97	0.80
QUINCY	92	0 (0%)			0.11	0.10	1.14	1.67
REVERE	52	0 (0%)			0.56	0.99	1.24	1.58
SAUGUS	32	0 (0%)			1.07	1.40	1.34	1.50
SOMERVILLE	80	0 (0%)			0.13	0.40	1.14	1.24
SOUTHBOROUGH (c)	12	0 (0%)			0.18	0.30	1.11	1.06
STONEHAM	28	0 (0%)			0.90	1.24	1.31	1.66
SWAMPSCOTT	18	0 (0%)			0.52	1.22	1.22	1.59
WAKEFIELD (b)	44	0 (0%)			0.21	0.40	0.98	1.47
WALTHAM	68	0 (0%)			0.01	0.10	1.08	1.51
WATERTOWN	40	0 (0%)			0.34	0.50	1.19	1.35
WELLESLEY (b)	36	0 (0%)			0.07	0.15	0.47	0.38
WESTBORO HOSPITAL	6	0 (0%)			0.80		1.45	
WESTON (c)	17	0 (0%)			1.06	0.23	1.48	1.03
WINCHESTER (b)	20	0 (0%)			0.10	0.05	0.71	0.70
WINTHROP	24	0 (0%)			0.07	0.50	1.07	1.40
WOBURN (b)	64	0 (0%)			0.03	0.03	0.70	0.53
Total:	1666	0 (0%)						
MASS. WATER RESOURCES AUTHORITY (d)	638	2 (0.31%)		no	0.04	0.05	1.28	1.51

(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 chlorminate.

(d) MWRA sampling program includes the subset of communities as well as sites along the transmission system, tanks and pumping stations.

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

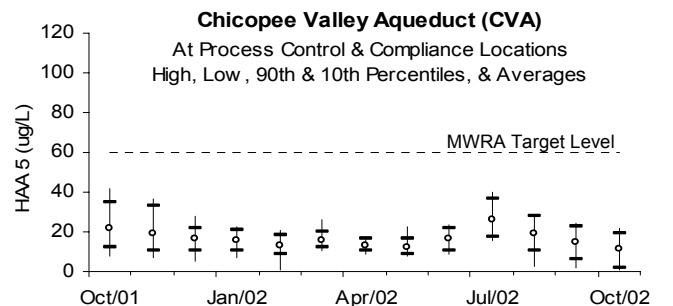
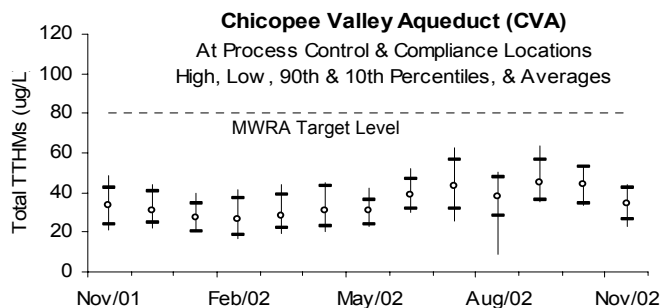
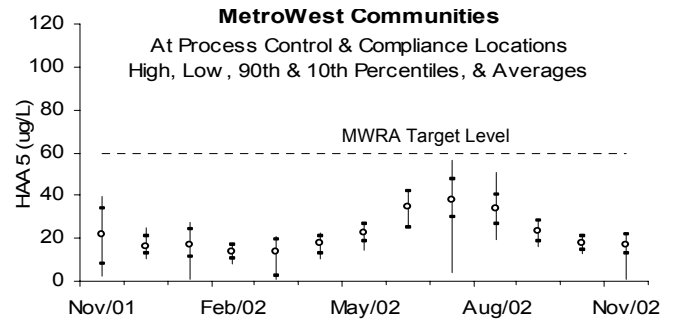
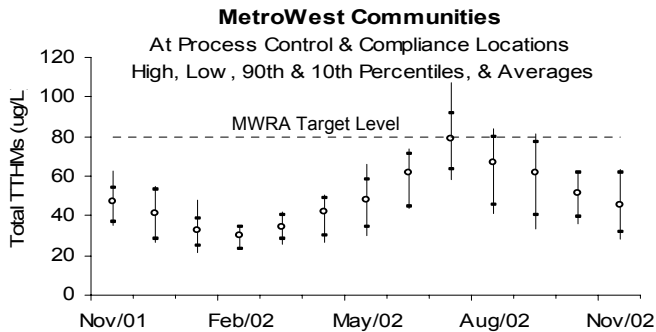
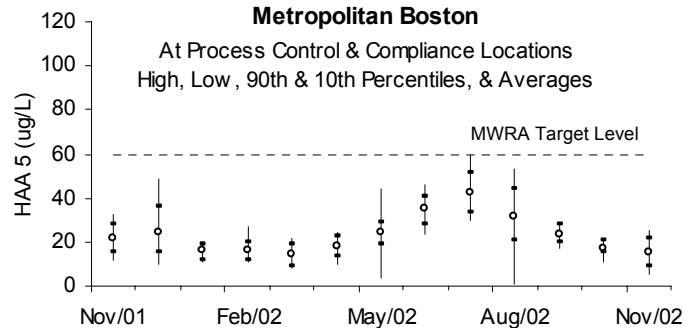
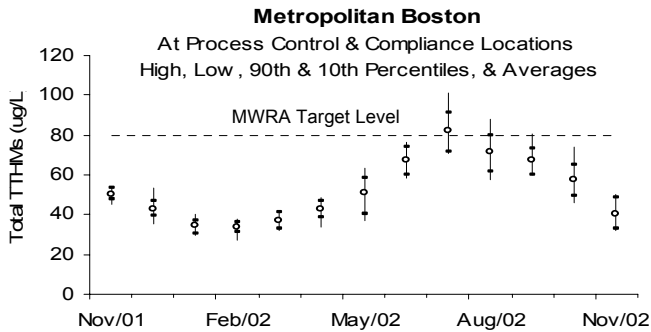
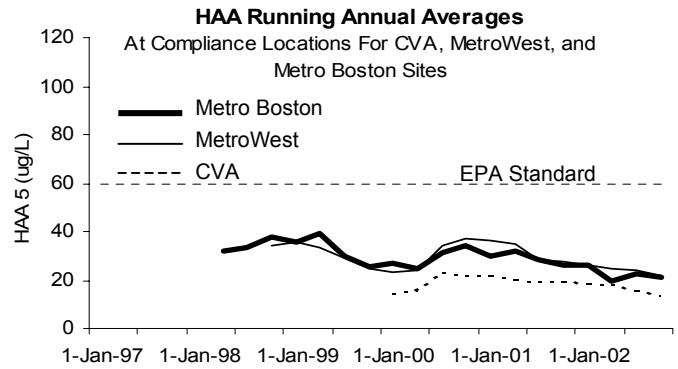
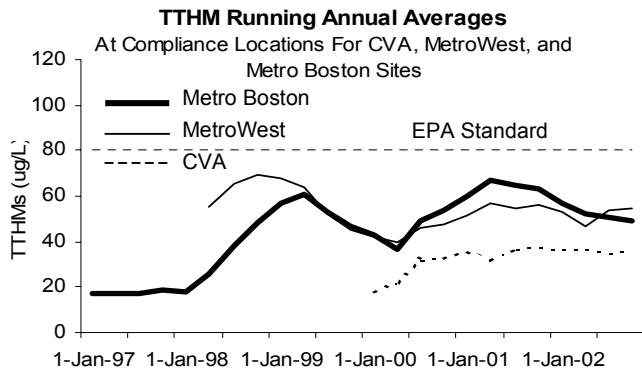
November 2002

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. The EPA running annual average standards are 80 ug/L for TTHMs and 60 ug/L for HAA 5. DEP requires that compliance samples be collected quarterly. MWRA samples weekly at some locations, monthly and quarterly at others. **Metro Boston numbers are used for compliance purposes;** results presented below from CVA and MetroWest sampling sites enable MWRA staff to monitor control of MWRA treatment processes. Individual CVA and MetroWest communities are responsible for their own compliance monitoring and reporting. They must be contacted directly for their results.

The running annual average for TTHMs and HAA5s at compliance locations, represented in the graphs at the top of the page, remained below current standards. Average monthly TTHM levels at all process control sampling locations for the MetroWest communities and Metropolitan Boston are slightly lower than those of last year. The CVA communities monthly TTHM was slightly higher than last year. Average monthly HAA5 levels at all process control sampling locations for CVA, MetroWest communities and Metropolitan Boston are slightly lower than those of last year.

TOTAL TRIHALOMETHANES

HALOACETIC ACIDS



MWRA Monthly Water Quality Analysis

November 2002

This page provides information on water quality at six locations in the MWRA transmission system. Results reflect a "snapshot" in time and may not represent typical conditions. Elevated levels of a particular parameter may occur from time to time. MWRA staff review these numbers carefully and follow-up unusual results by re-analyzing samples, collecting new samples, or auditing sample sites. More rigorous daily or weekly monitoring of select parameters at these and other locations provides a better overall picture of water quality and is reported for some parameters elsewhere in this document. Monitoring for a number of parameters in this table will be reduced to quarterly, if they either (1) have minimal variability or (2) are always below detection levels.

Component	CVA System →		Metropolitan Boston →				I Standards →		
	Quabbin Reservoir at Ware Disinfection Facility (Raw)	Nash Hill Storage Tanks (Treated)	Wachusett Reservoir at Cosgrove Intake (Raw)	ICC, Marlboro (Treated)	Comm Ave., Newton (Treated)	Shaft 9A, Malden (Treated)	Standard	Units	Exceedance
Alkalinity	3.1	3.8	5.0	33.7	34.5	33.9		MG/L	
Aluminum	Quarterly	Quarterly	< 20	< 20	< 20	< 20	50-200 (a)	UG/L	NO
Ammonia-N	0.005	< 0.005	0.009	< 0.005	0.344	0.336		MG/L	
Antimony	Quarterly	Quarterly	< 0.9	< 0.9	< 0.9	< 0.9		UG/L	
Arsenic	Quarterly	Quarterly	< 0.8	< 0.8	< 0.8	< 0.8	50 (b)	UG/L	NO
Barium	Quarterly	Quarterly	7.7	9.2	7.5	7.7	2000 (b)	UG/L	NO
Beryllium	Quarterly	Quarterly	< 0.1	< 0.1	< 0.1	< 0.1	4 (b)	UG/L	NO
Bromate	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	10 (b)	UG/L	NO
Bromide	10.6	< 2.5	13.4	< 2.5	3.3	3.5		UG/L	
Cadmium	Quarterly	Quarterly	< 0.2	< 0.2	< 0.2	< 0.2	5 (b)	UG/L	NO
Calcium	Quarterly	Quarterly	3770	3900	3800	3800		UG/L	
Chloride	6.2	Quarterly	16.8	18.6	18.6	19.1	250 (a)	MG/L	NO
Chlorine, Free	NS	0.28	NS	0.86	NS	NS		MG/L	
Chlorine, Total	NS	NS	NS	0.99	1.86	1.78		MG/L	
Chromium	Quarterly	Quarterly	< 0.6	< 0.6	< 0.6	< 0.6	100 (b)	UG/L	NO
Coliform, Fecal, MF Method	0	NS	1	NS	0	0	20 (c)	CFU/100 mL	NO
Coliform, Total, MF Method (e)	5	0	0	0	0	0	100 (c) 0 (d)	CFU/100 mL	NO
Copper **	< 0.9	15.5	3.3	12.2	2.9	7.3	1300 (b)	UG/L	NO
Cyanide	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.2 (b)	MG/L	NO
Fluoride	Quarterly	Quarterly	0.04	1.18	1.23	1.20	4 (b)	MG/L	NO
Hardness	Quarterly	Quarterly	12.4	12.7	12.5	12.4		MG/L	
Iron **	Quarterly	Quarterly	16.4	32.9	18.8	20.4	300 (a)	UG/L	NO
Lead	Quarterly	Quarterly	< 1.2	< 1.2	< 1.2	< 0.9	15 (b)	UG/L	NO
Magnesium	Quarterly	Quarterly	728	731	726	714		UG/L	
Manganese	Quarterly	Quarterly	37.8	81.2	25.7	30.9	50 (a)	UG/L	YES
Mercury	Quarterly	Quarterly	< 0.01	< 0.01	< 0.01	< 0.01	2 (b)	UG/L	NO
Nickel	Quarterly	Quarterly	< 1.0	< 1.0	< 1.0	< 1.0		UG/L	
Nitrate-N	0.009	0.011	0.039	0.039	0.039	0.039	10 (b)	MG/L	NO
Nitrite	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		MG/L	
Orthophosphate	Quarterly	Quarterly	< 0.003	0.007	0.004	0.004		MG/L	
pH	7.0	6.8	7.1	7.2	9.1	9.0		S.U.	
Potassium	Quarterly	Quarterly	703	721	726	722		UG/L	
Selenium	Quarterly	Quarterly	< 0.9	< 0.9	< 0.9	< 0.9	50 (b)	UG/L	NO
Silica (SiO2)	Quarterly	Quarterly	1290	1820	1770	1760		UG/L	
Silver	Quarterly	Quarterly	< 0.4	< 0.4	< 0.4	< 0.4	100 (a)	UG/L	NO
Sodium	Quarterly	Quarterly	9.0	23.6	23.9	23.4		MG/L	
Specific Conductance	43	Quarterly	83	144	Quarterly	Quarterly		UMHO/C	
Standard Plate Count, HPC (48 Hrs @ 35C)	NS	NS	65	4	0	NS	500 (d)	CFU/mL	NO
Sulfate (SO4)	Quarterly	Quarterly	6.7	6.5	6.4	6.5		MG/L	
Thallium	Quarterly	Quarterly	< 1.0	< 1.0	< 1.0	< 1.0		UG/L	
Total Dissolved Solids	42	41	66	82	93	90		MG/L	
Total Organic Carbon	1.90	Quarterly	1.80	1.80	Inv Res	1.78		MG/L	
Total Phosphorus	< 0.005	0.005	< 0.005	0.011	0.011	0.009		MG/L	
UV-254	0.017	0.013	0.032	0.0251	Inv Res	0.035		A	
Zinc **	Quarterly	Quarterly	1.4	3.8	1.7	1.4	5000 (a)	UG/L	NO

(a) = Secondary MCL standard (aesthetic related). DEP "Drinking Water Regulations", 310CMR 22.00.

(b) = Primary MCL standard (health related). DEP "Drinking Water Regulations", 310CMR 22.00.

(c) = Primary MCL standard (health related), applies to source (raw) water only. DEP "Drinking Water Regulations", 310CMR 22.00.

(d) = Primary MCL standard (health related). DEP "Drinking Water Regulations", 310CMR 22.00. Applies to samples of treated water downstream of Wachusett and Quabbin Reservoirs.

(e) - 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

** = Metal results may be elevated due to local plumbing at the sample tap.

Quarterly = Reduced to Quarterly Monitoring

Inv Res = Invalid sample result

umhos = ohms/1000

Most results are based on single grab samples collected on November 4 & 5, 2002 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.

The manganese result for the sample collected at the ICC in Marlboro exceeded the secondary MCL of 50 ug/L which is an aesthetic standard. This result is considered to be anomalous as Mn levels in the MWRA system tend to be low. Over the past 12 months, manganese values ranged from 1.4 to 42.6 ug/L, and averaged 13.1 ug/L, at this site. Mn levels at the other tested sites were below the MCL.

The Total Organic Carbon and the UV-254 results were invalid for Comm Ave. due to suspected contamination during sample collection. These are supplemental tests which the MWRA performs and are not required per the DEP.

Special Update on Lead and Copper Sampling for 2002

November 2002

Good News on Lead Levels

It appears that the long effort to optimize corrosion control of MWRA water has finally paid off. The September 2002 sampling results showed that system-wide lead and copper levels at consumers' taps continued to be lower than the Lead and Copper Rule's Action Levels. MWRA is now in compliance with the Lead and Copper Rule, with lead and copper results below Action Levels for the required two consecutive sampling rounds.

Background

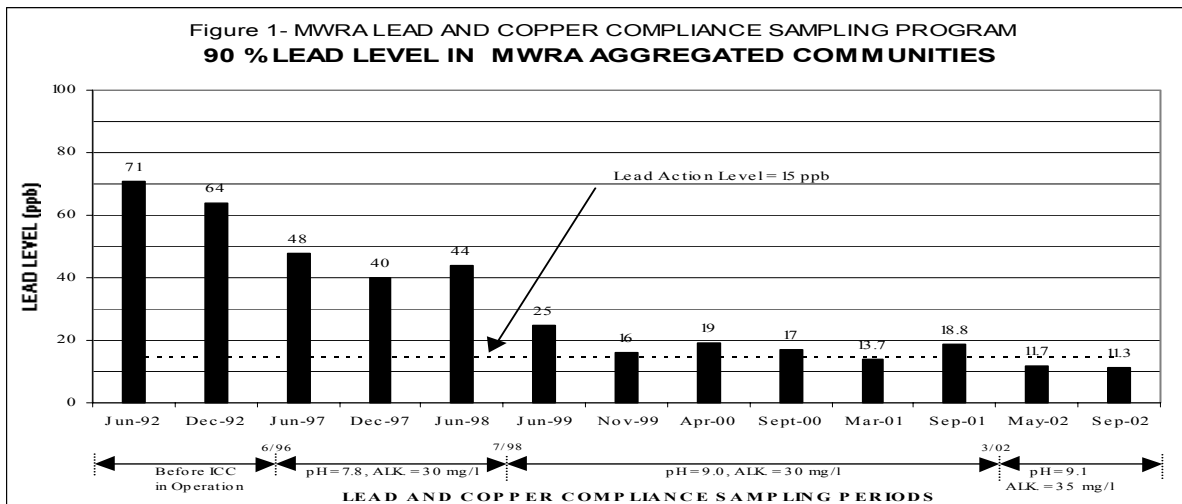
MWRA source waters contain virtually no lead, but lead can leach from lead service pipes connecting homes to water mains and from lead solder and brass fixtures in homes. In 1991, EPA issued the Lead & Copper Rule which set action levels of 15 ppb for lead and 1,300 ppb for copper, and required that 90 percent or more of targeted high risk homes be below that level. MWRA conducts two rounds of sampling for lead and copper at consumer's taps each year. The samples must be first flush samples taken at homes and locations most likely to have high levels of lead after the water has sat stagnant overnight.

In 1993, the MWRA Board of Directors approved a fast-track program to improve treatment to reduce lead levels at consumers' taps through construction of the Interim Corrosion Control (ICC) facility in Marlborough. This interim facility will be used until the new Walnut Hill Water Treatment Plant is completed in 2004.

A three phase ramp-up of the facility began in June 1996 and was completed in July 1998, and the first full-scale compliance sampling round was carried out in June 1999. Subsequent rounds were taken in November 1999, April and September 2000, and March and September 2001. Over 500 samples were collected for each sampling round at each of the 29 fully served communities in the metro Boston area, of which over 400 samples were residential samples and about 100 samples were school samples. Lead levels dropped significantly after the change in treatment, but still did not consistently meet the standard. Therefore, in March 2002, MWRA adjusted the corrosion control process again by fine tuning the pH and alkalinity levels. The first round of sampling in May showed that the upgraded treatment reduced lead levels to less than the Lead Action Level and to a new low. These most recent results confirmed that MWRA has further improved lead and copper corrosion control treatment with new all time low levels.

Results

The September data showed that 92 percent of the targeted high-risk homes had lead levels below the Action Level of 15 parts per billion (ppb), against a target of 90 percent. The 90th percentile of lead results was 11.3 ppb. Despite the higher water temperatures for the September sampling round, these are the lowest lead results seen in any sampling since the program was started in 1992. Figure 1 shows 90th percent lead levels.



The 90th percentile for copper was 117.3 ppb, compared with the Action Level of 1,300 ppb. MWRA has always been in compliance with the Copper Action Level of 1,300 ppb.

Future Actions

Since the system now meets the Action Levels for both lead and copper, MWRA has applied to DEP for a reduction in the frequency of sampling from twice a year to once a year, reducing the cost of that program and reducing the communities' burden of arranging sample collections.

Also, since the MWRA system is now in compliance with the Lead and Copper rule, communities and MWRA will no longer be required to conduct mandatory lead education. But, since many homes continue to have lead-containing fixtures and plumbing, lead in drinking water continues to be the most frequent consumer concern, and the variability in sample results for 'worst case' homes, MWRA will continue to provide information to consumers through the annual water quality report and other means. MWRA will also continue to work with communities to provide consumers with the simple message that flushing the tap before drinking, and not using water from the hot water tap for cooking or drinking, is the best way to reduce the potential for lead exposure. For further information on lead and more tips, visit the MWRA website at www.mwra.com.

Other Water Quality Benefits

In addition to the lead and copper reduction, the corrosion control treatment has provided additional benefits in helping maintain chlorine residual and controlling nitrification. Since the implementation of high pH for corrosion control and modification of chloramine disinfection, chlorine booster stations for remote communities have been shut down, average chloramine residuals have risen substantially, and less than 4% of the over 400 chlorine sample locations have residuals less than 0.10 mg/l. The number of red/yellow water complaints from iron corrosion of unlined cast iron pipes has also been reduced significantly.

Benefits have extended to the wastewater system as well. Copper levels in the biosolid fertilizer pellets produced at the Fore River pelletizing plant have dropped substantially over the last two years. The weekly lead concentrations have lower peaks and have not exceeded the EPA standard for unrestricted use of 300 mg/kg since September 1999. The copper concentrations have reduced significantly below the EPA standard for unrestricted use of 1000 mg/kg since August 1998. Presently, both lead and copper concentrations in the biosolid pellets are approximately 40% under the EPA limit of lead and copper for unrestricted use. For more information on the MWRA biosolid fertilizer program, go to www.mwra.com/sewer/html/sewssc.htm.