



# Water Quality

## ANNUAL REPORT

### To Our Customers

This year marks the tenth anniversary of Concord Public Works' Annual *Water Quality Report*. Over the years, I have heard first-hand from customers that they value and appreciate receiving this annual update. If you are unfamiliar with this report, I encourage you to take a moment and leaf through it. You will find it useful information on where your drinking water comes from, what is found in the water, the types of treatment processes used to make it safe to drink, and helpful tips on efficient use of water.

First and foremost, rest assure that Concord's water quality continues to meet and exceed all state and federal regulatory standards. Effective land-use protection efforts around our surface water supply and groundwater supplies, along with tight quality control measures taken within our water treatment systems, make this possible. Continued investment in routine maintenance and capital improvements are also made to optimize water quality treatment practices which includes the application of the most current technological advances for enhanced monitoring and control.

Concord Public Works also recognizes that our operations are integrally connected to broader water resource management interests. As such, we continue to explore opportunities and adopt measures by which we can maximize efficiencies while minimizing environmental impacts. As we strive to find the appropriate balance, you can expect that your participation and support, specifically in the area of wise water use, will become increasingly important.

As always, if you have any questions or comments regarding this Report or any other aspect of Concord's municipal water system, I welcome your feedback and input.

Respectfully,

Alan H. Cathcart,  
Superintendent, Water/Sewer Division  
Concord Public Works

### 2009 HIGHLIGHTS

- **Concord Water received MassDEP's Public Water Supplier—2010 Water Conservation Award for exhibiting "exemplary water conservation practices".**
- **Concord Public Works hosted the 1st "Unwanted Medication and SHARPS Collection Day" to provide one more tool for enhanced protection of local groundwater resources.**
- **Approximately 1,684 feet of water main was replaced along Walnut Street and Chestnut Street to provide for improved quality and fire protection.**
- **Created new water main inter-connection between West Concord and Harrington Avenue neighborhoods in conjunction with Pine Street Bridge reconstruction project.**
- **A \$32,475 grant was awarded by the Massachusetts Department of Environmental Protection to allow for the implementation of water conservation measures in town buildings.**

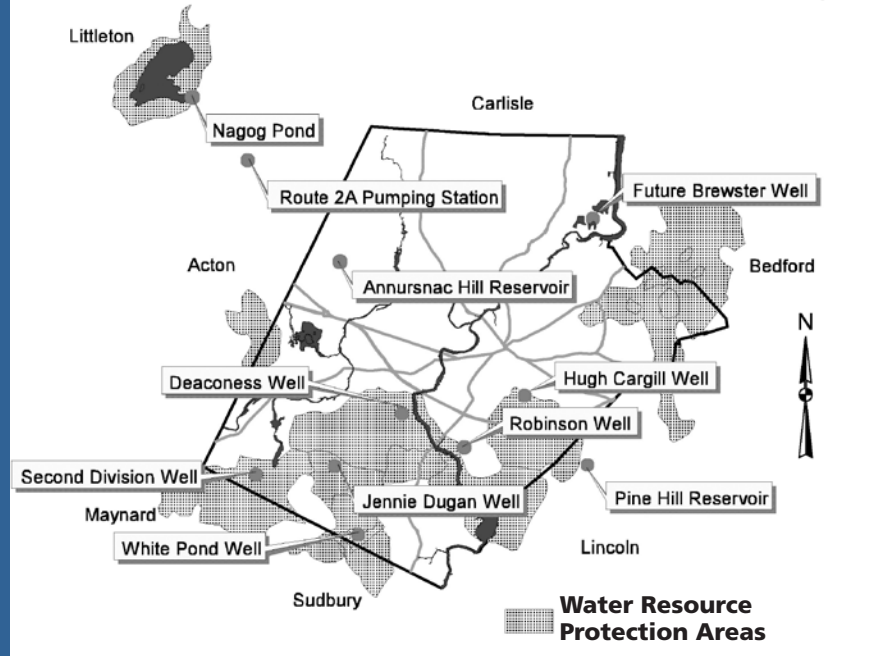
## Water Treatment

In accordance with state and federal drinking water requirements, Concord's water is treated before it gets to your tap. Treatment includes: *disinfection*—via the addition of liquid chlorine at all groundwater supplies and ozone/UV light plus chlorine gas at the Nagog Pond water supply; *corrosion control*—via the addition of potassium hydroxide and polyphosphate to raise the natural pH of the water and reduce its corrosiveness to household plumbing; *fluoridation*—via the addition of sodium fluoride to help prevent tooth decay; *iron sequestration*—performed by adding polyphosphate to reduce the frequency of discoloration events; and *iron and manganese removal*—performed by pressure filtering the Deaconess and White Pond wells. Due to a high level of water quality in Nagog Pond, the Town continues to operate this source under a filtration waiver. Chemical adjustments and disinfection are provided as noted above to ensure a safe drinking water is delivered to customer's taps.

## Basic Information About Drinking Water

Sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it will dissolve naturally occurring minerals and, in some cases, radioactive material, and can pick up other substances resulting from the presence of animals or human activities. In order to ensure that tap water is safe to drink, the MassDEP and EPA prescribe regulations that limit the amount of certain contaminants in the water provided by public water systems. The Food and Drug Administration and the Mass. Department of Public Health regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

## Town of Concord Water Supply



## Water Supply

Concord's water system consists of six groundwater supply wells located in Concord and one surface water supply located on the Acton/Littleton town line. In addition, Concord has pumping stations, two storage reservoirs with a 7.5 million gallon total capacity, approximately 130 miles of water main, and 1,240 fire hydrants. Depending on the season, all available production facilities may be called upon to satisfy system demands which fluctuate between 1.5 million gallons per day (MGD) during the winter months to over 4 MGD in the summer. Concord's public water system is interconnected with Acton and Bedford for emergency backup, if ever needed.

*continued on page 7*

## SOURCE TREATMENT

	Nagog Pond, Acton, MA	Jennie Dugan Well	Deaconess Well	White Pond Well	Second Division Well	Robinson Well	Hugh Cargill Well
Source ID	01S	01G	03G	04G	05G	06G	07G
Potassium Hydroxide to Adjust pH for Corrosion Control	•	•	•	•	•	•	•
Ultra-Violet Light for Disinfection	•						
Chlorine for Disinfection	•	•	•	•	•	•	•
Ozone for Disinfection	•						
Fluoride to Promote Strong Teeth	•	•	•	•	•	•	•
Polyphosphate for Iron & Manganese Treatment and Corrosion Control	•	•	•	•	•	•	•
LayneOx™ Pressure Filtration for Iron & Manganese Removal			•	•			
Source Water Protection (SWAP) susceptibility rating*	High	Moderate	High	High	High	High	High

\*Susceptibility ratings were developed as a part of the SWAP report and reflect the proximity of potential contaminant sources like farms, golf courses and residential houses to water supplies. Complete SWAP reports are available at 135 Keyes Road and online at [www.state.ma.us/dep/brp/dwsl](http://www.state.ma.us/dep/brp/dwsl).

### Residents can help to protect Concord's water supplies by:

- Practicing good septic system maintenance
- Supporting water supply protection initiatives at the next town meeting
- Limiting pesticide and fertilizer use

# Water Quality Summary

Listed below are the substances detected in Concord's drinking water in 2009 (or most recent round of testing) in accordance with MA DEP and US EPA drinking water regulations. The presence of these substances does not necessarily indicate that the water poses a health risk. These substances are divided into 3 categories, Primary, Secondary, and Lead & Copper Parameters. Primary parameters protect drinking water quality by limiting the levels of contaminants that can adversely affect public health and are known or anticipated to occur in public water systems. Secondary parameters are set for aesthetic purposes and are designed to assist the EPA in determining their occurrence in drinking water and whether future regulation is warranted. Not listed are over 130 substances we tested for but did not detect. All substances listed below are in units of ppm (parts per million) unless otherwise noted.

## PRIMARY PARAMETERS

Substance	Highest Level Detected	Range of Levels Found	Highest Level Allowed (EPA's MCL)	Ideal Goal (MCLG)	Violation	Major Sources in Drinking Water
Arsenic	0.002	ND-0.002	0.01	0	No	Erosion of Natural Deposits; Runoff from Agriculture
Barium	0.032	0.008-0.032	2	2	No	Erosion of Natural Deposits
Free Chlorine	0.31 <sup>2</sup>	0.03-0.59	4 (MRDL)	4 (MRDLG)	No	Water treatment for disinfection
Fluoride <sup>1</sup>	1.5	0.3-1.5	4	4	No	Water additive which promotes strong teeth
Haloacetic Acids (ppb)	3.3 <sup>2</sup>	ND-7.6	60	No Standard	No	By-product of drinking water disinfection
Nitrate	2.1	0.07-2.1	10	10	No	Runoff from fertilizer use; Erosion of natural deposits
Selenium	0.007	ND-0.007	0.05	0.05	No	Erosion of natural deposits
Trihalomethanes (ppb)	6.9 <sup>2</sup>	ND-27	80	No Standard	No	By-product of drinking water disinfection
Turbidity (NTU) <sup>3</sup>	0.2	ND-0.2	5	1	No	Suspended matter from soil runoff

## SECONDARY PARAMETERS

Calcium	32.8	8.6-32.8	No Standard	No Standard	No	Erosion of natural deposits
Chloride	170	14-170	250	250	No	Naturally present in the environment
Copper	0.37	ND-0.37	1.3	1.3	No	Household plumbing, see statement below <sup>4</sup>
Hardness	120	30-120	No Standard	No Standard	No	Erosion of natural deposits
Iron	0.4	ND-0.4	0.3	No Standard	No	Erosion of natural deposits
Magnesium	9.2	2.1-9.2	No Standard	No Standard	No	Erosion of natural deposits
Manganese	0.34	ND-0.034	0.05	No Standard	No	Erosion of natural deposits
Methyl Tertiary-Butyl Ether (ppb)	1.4	ND-1.4	No Standard	No Standard	No	Fuel Additive
Zinc	0.095		5	No Standard	No	Naturally present in the environment

## LEAD & COPPER PARAMETERS<sup>4</sup>

Substance	90th Percentile Level Detected	Range of Levels Found	90th Percentile Action Level (EPA's MCL)	Ideal Goal (EPA's MCLG)	Violation	Major Sources in Drinking Water
Lead (ppb)	3	ND-8	15	0	No	Household plumbing, see statement below
Copper	0.37	0.04-0.52	1.3	1.3	No	Household plumbing, see statement below

## TERMS & ABBREVIATIONS

**Action Level:** The concentration of a contaminant that, if exceeded, triggers treatment or other requirements, which a water system must follow.

**MCL:** (Maximum contaminant Level) The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available treatment technology.

**MCLG:** (Maximum Contaminant Level Goal) The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.

**MRDL:** (Maximum Residual Disinfectant Level) The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**MRDLG:** (Maximum Residual Disinfectant Level Goal) The level of a drinking water disinfectant below which there is no known expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**ppb:** parts per billion or micrograms per liter

**ppm:** parts per million or milligrams per liter

**ND:** none detected

**NTU:** Nephelometric Turbidity Units

**90th Percentile:** Out of every 10 homes 9 were at or below this level.

## FOOTNOTES

- Fluoride:** The Concord Board of Health voted to fluoridate the drinking water in 1969. Fluoridation using Sodium Fluoride began in 1970. For questions about water fluoridation, contact the Concord Board of Health at 978 318 3275. The MA Department of Public Health's ideal goal for fluoride is 1 ppm.
- Haloacetic Acids, Trihalomethanes and Free Chlorine:** The highest level detected represents the highest quarterly running annual average for these contaminants.
- Turbidity:** Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of water quality and the effectiveness of disinfectants.
- Lead and Copper:** In accordance with EPA regulations, Concord Public Works tests the tap water of 30 homes in Concord for lead and copper every three years. Testing was last done during August and September 2008 and is next scheduled for completion during the summer of 2011. EPA determines whether the protection against corrosion is sufficient by requiring that at least 90% of the sampled homes have lead levels under 15 parts per billion (ppb). This is called the Action Level.

# Water Conservation

## Lawn Irrigation

An irrigation system should be checked each spring before use to make sure it was not damaged by frost or freezing.

- An irrigation system with pressure set at 60 pounds per square inch that has a leak 1/32nd of an inch in diameter (about the thickness of a dime) can waste about 6,300 gallons of water per month, at a cost of \$35.
- In-ground irrigation system owners need to make sure their systems are maintained and operating properly. Find a certified contractor at [www.irrigation.org](http://www.irrigation.org).
- According to Town Bylaw, all irrigation systems must have an operable rain sensor that is located in a spot where it can be reached by rainfall (not under an eave).
- Lawns don't need to be watered every other day. In most weather conditions, once or twice a week is usually sufficient.

## Want to learn how to use your irrigation system more efficiently?

A certified irrigation system assessor will come to your home or business to determine the efficiency of your system for *no cost*. You will receive a report documenting your property's irrigation water use with recommendations for repairs and/or improvements that can save you water and money by using moisture sensitive controls.

**REMINDER:** Town bylaw requires that in-ground sprinkler systems be registered with the town. To request an irrigation assessment or information on how to register your sprinkler systems please visit [www.concordma.gov](http://www.concordma.gov) or call 978-318-3250.

## Special Offer! For Concord Water Customers



### Rain Barrel Only \$74.95\*

Save water and money by collecting rainwater for your garden and plants

Order online at  
<http://Inrainbarrel.com/Concord.html>  
or call Joan toll-free 1-877-977-3135

**Order by May 21, 2010**

Pick up rain barrels at CPW, 135 Keyes Road,  
4:00–7:00 p.m., Wednesday, May 26

## Water Saving Devices

Concord's Water and Sewer Division wants to help you conserve water, so we are giving away **FREE** water conservation devices! Stop by our office at 135 Keyes Rd. weekdays 7:30–3:30 or call 978-318-3250.

- **Rain Gauge**—Keep track of rainfall to avoid over-watering your lawn.
- **Leak Detection Kit**—A simple test to determine if you have a leaky toilet.
- **Bathroom Flip Aerator**—Temporarily halt the flow of water with a flip of the switch without readjusting temperature controls. Great for shaving and brushing teeth.
- **Dual Setting Flip Aerator with Swivel for the Kitchen**—A swiveling aerator that has a full flow for filling pots, a wide spray for rinsing fruits and vegetables, and a flow restrictor for use when washing dishes.
- **Low-flow Showerhead**—An attractive, high-quality showerhead that uses 2.0 gallons per minute that doesn't feel "low-flow." Cut your shower water use in half.
- **"Water Miser" Garden Hose Nozzle**—Enjoy watering your garden with this six-spray pattern nozzle that ranges from a fine mist to a high-powered spray.
- **Shower Timer**—Helps you keep your showers to five minutes.
- **Presentations to Local Groups**—Concord Public Works staff is available to come to your organization to talk about water resource protection and conservation. Give us a call!

### Make Every Drop Count With WaterSense



#### What is WaterSense?

Launched in 2006, WaterSense is an EPA-sponsored partnership program that seeks to protect the future of our nation's water supply by promoting water efficiency and enhancing the market for water-efficient products, programs, and practices.

When buying a new toilet, faucet or showerhead look for the WaterSense label, which will help you identify water-efficient products and programs that meet WaterSense water efficiency and performance criteria.

#### Why buy a water sense product?

- They are 20 percent more water-efficient than average products in that category.
- Provide measurable water, energy and money saving results.
- Encourage innovation in manufacturing.

For more information please visit [www.epa.gov/watersense](http://www.epa.gov/watersense)

### Find a Leak

**You could save 10% on your water bill**

Leaks can account for, on average, 10,000 gallons of water wasted in the home every year, which is enough to fill a backyard swimming pool. Ten percent of homes have leaks that waste 90 gallons or more every day.

Fixing easily corrected household water leaks can save homeowners more than 10 percent on their water bills.

Two good methods to tell if you have a leak:

- **Examine your winter water usage.** It's likely that a family of four has a serious leak problem if its winter water use exceeds 400 gallons per day.
- **Check your water meter** before and after a two-hour period when no water is being used. If the meter does not read exactly the same, you probably have a leak.

### Community Conservation Challenge Provides Aid to Sister City

This year 88 Concord households took shorter showers, replaced inefficient toilets and showerheads, and watered their lawn less to help bring potable water to residents of a Nicaraguan village thousands of miles away. These families participated in the Community Conservation Challenge, an outreach campaign organized by Concord Public Works that links fundraising for community groups with water conservation.

This year, Concord Public Works partnered with the Concord-San Marcos Sister Cities Committee to raise funds to help bring drinking water to the village of El Uval, located in the municipality of San Marcos. For the 400 people who live

in El Uval, water is customarily transported in barrels on horseback, as it has been for over 100 years. The Sister Cities Committee has been raising funds for the community to drill a well and construct a distribution system.

Seven local organizations recruited the 88 households to join the conservation effort, that overall reduced summer-

time water use by over 500,000 gallons and helped earn more than \$3,500 for El Uval Drinking Water project.

"All told, the money will cover the drilling of a 300-meter well, the installation and electrification of a pump, the building of a shelter for the pump, and the assembly of distribution pipes. The families of El Uval have never had access to clean water except what they could transport in barrels on horseback," says Steven Bloomfield, chair of the Concord-San Marcos Sister Cities Committee. "We expect what should readily be expected: a marked improvement in public health and hygiene." Congratulations to all participants on a job well done.

Grant funds from the Massachusetts Environmental Trust and Massachusetts Department of Environmental Protection supported much of the Conservation Challenge.



# Cross Connection Control and You

Concord Public Works Water Rules and Regulations, as well as Massachusetts' drinking water regulations require that public water supplies be protected from potential contamination resulting from cross connections.

## What is a cross connection?

A cross connection occurs whenever a potable drinking water line is directly or indirectly linked to a piece of equipment or piping containing non-potable (polluted) water.

## Why should I be concerned?

An unprotected or inadequately protected cross connection in your home or workplace could contaminate the drinking water not only in your building, but also in neighboring homes and businesses. Severe illnesses have been caused by cross connection contamination that could have been prevented.

## How does this happen?

Typically this occurs when equipment, plumbing fixtures or attachments such as garden hoses may contain chemicals or water that becomes contaminated over time. When something unexpected happens that alters water pressure in the line or the direction of water flow, contaminants are then sucked from the equipment back into the drinking water line.

## Can it happen at my home?

Outdoor hose bibbs and garden hoses tend to be the most common sources of cross connections at home. The garden hose creates a hazard when submerged in non-potable water such as a swimming pool or when attached to a chemical sprayer for weed killing. Fertilizer, garden chemicals or other materials may contaminate hoses left lying on the ground. Other household cross connections can occur when lawn irrigation systems, boilers, water filtration devices, and fire service systems are connected to the home's plumbing.

## How can I be protected?

All industrial, commercial and institutional facilities are annually surveyed to ensure that all potential cross connections are identified and eliminated or protected by a backflow preventer. We also inspect and test these backflow preventers to make sure they are providing maximum protection.

At home, do not attach any chemical or non-potable liquid applicators to anything connected to your plumbing system. Outdoors, install hose bibb vacuum breakers on any outside faucet. Owners of in-ground irrigation systems are required to have an operable backflow preventer installed on the system.

# Potential Sources of Contaminants

Contaminants that may be present in source water include:

- **Microbial contaminants**, such as viruses and bacteria, may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

- **Inorganic contaminants**, such as salts and metals, can be naturally occurring or result from urban storm water runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, and farming.
- **Pesticides and herbicides** may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- **Organic chemical contaminants** include synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- **Radioactive contaminants** can be naturally occurring or be the result of oil and gas production, and mining activities.

In order to ensure that tap water is safe to drink, the Department and EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. FDA and the Massachusetts Department of Public Health regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least some small amounts of certain substances which the EPA calls "contaminants." The presence of these substances does not necessarily indicate that the water poses a health risk. For example, naturally occurring dissolved minerals are commonly found in well water. More information about the substances found in drinking water and their potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1-800-426-4791 or the Massachusetts Drinking Water Program at 1-617-292-5770.

## Three Ways to Help Protect Concord Water

Our drinking water supply is precious and we need to protect it. Protection of Concord's untreated water supply is the first line of defense in ensuring cost-effective, safe drinking water.

### DO NOT FLUSH YOUR UNUSED PHARMAEUTICALS!

Bring your unwanted medications and sharps to the Unwanted Medication Collection Event sponsored by Concord Public Works and REUSIT, on Concord's semi-annual DropOff Day.  
**135 Keyes Road — Spring: May 8, 9:30–3:00 — Fall: TBA**

**DON'T DUMP HAZARDOUS WASTE** into household drains, storm drains, on the ground or into trash. Bring your household hazardous waste to the Concord's Hazardous Waste collection day.  
**133 Keyes Road — Wednesday, June 2, 3:30–7:30 p.m.**

**KEEP STORMWATER CLEAN** by practicing healthy household habits. Keep common pollutants like pesticides, pet waste, grass clippings, and automotive fluids off the ground and out of stormwater. **For more information please visit [www.concordma.gov/Pages/ConcordMA\\_Engineering/index](http://www.concordma.gov/Pages/ConcordMA_Engineering/index).**

## Quality Control

To ensure that tap water is safe to drink, the EPA enforces regulations that require stringent monitoring of specific contaminants within public water supply systems. Within Concord's system, over 500 tests are run each year to assess approximately 145 potential contaminants. We are proud to report that Concord's water quality testing program not only meets EPA's requirements for drinking water but goes above and beyond those requirements to satisfy the higher standards we have set for ourselves. Additional water quality information is available on our website at [www.concordma.gov](http://www.concordma.gov).

## Drinking Water and People with Weakened Immune Systems

Some people may be more vulnerable to contaminants in drinking water than the general population. People with weakened immune systems such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people

with HIV/AIDS or other immune system disorders, some elderly people, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the EPA's Safe Drinking Water Hotline at 1-800-426-4791.

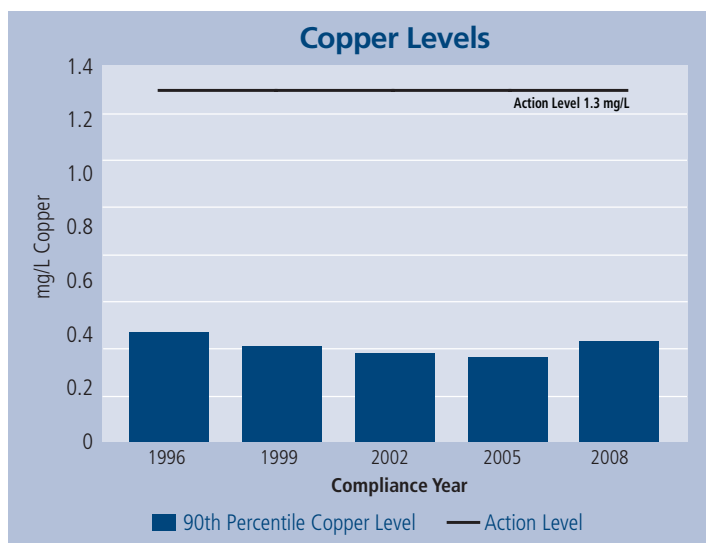
## Get Involved

The Public Works Commission oversees the work of CPW. Their meetings provide an opportunity to become more involved in issues relating to the water system. They typically meet the second Wednesday of each month at 7 pm. Please check the CPW website for exact dates and location. For more information regarding water quality and resource protection initiatives, or if you have a neighborhood concern in a resource protection area (depicted on map p.2), please contact Melissa Simoncini, [msimoncini@concordma.gov](mailto:msimoncini@concordma.gov).

## Water Quality Lead & Copper

In accordance with U.S. Environmental Protection Agency (EPA) and Massachusetts Department of Environmental Protection (DEP) regulations, Concord Public Works tests for lead and copper on a three-year schedule. The last lead and copper sampling was performed in 2008 and will be repeated during the summer of 2011. A total of 30 homes throughout town are sampled on this schedule to confirm the effectiveness of our corrosion control efforts. The two graphs on this page summarize Concord's compliance levels for lead and copper for the past five compliance periods. More information on lead and copper compliance is available on page 3.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Concord Public Works is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at: [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead) or visit Concord Public Works website at [www.concordma.gov](http://www.concordma.gov).



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## SEASONAL RATES START MAY 1

Concord's Water Conservation Rate is in effect each year between May 1 and October 31 for residential customers. Water customers using more than 2,400 cubic feet of water bimonthly (more than 300 gallons daily), pay higher rates for their extra consumption, reflecting the higher cost of meeting peak water demand. Below are new residential water rates, effective June 1, 2010. One hundred cubic feet = 748 gallons.

- **Base Rate:** \$3.97 per 100 cubic feet (ccf) bimonthly.
- **Step 2:** \$7.77 per ccf for 2,500—4,800 cubic feet bimonthly May 1 through October 31.
- **Step 3:** \$9.92 per ccf over 4,800 cubic feet bimonthly May 1 through October 31.