



WATER QUALITY ANNUAL REPORT

CONCORD PUBLIC WORKS - 2003

To our Customers:

I am pleased to report that Concord Water was recently recognized for "outstanding performance" by the Massachusetts Department of Environmental Protection, as a result of consistently ranking within the top ten percent of all public water systems in the state. Systems are ranked primarily on regulatory compliance in monitoring, source protection, distribution systems, operator certification, and water management practices.

While we appreciate the recognition of our efforts, we understand there is more work to be done in order to achieve our long-term goal of improving drinking water quality. Over the next few years, a considerable amount of time and resources will be invested in directly improving drinking water quality observed at the tap.

Our current capital improvement plan includes: the design and construction of a full-scale water treatment facility at the Deaconess Well, our largest groundwater supply; ongoing rehabilitation of selected water mains, including sections of Beharrell Street, Old Bridge Road, Wilson Road, Liberty Street, and Ripley Hill Road; and pump station equipment upgrades at the Second Division and White Pond wells. In addition to these capital investments, day-to-day water quality monitoring and treatment efforts will continue to be reviewed and modified as needed.

Finally, while we are encouraged to see the end to last year's regional drought, Concord Public Works remains committed to promoting wise water use, regardless of seasonal uncertainties. In addition to updated water quality data traditionally presented within this report, we have also included water conservation recommendations for consideration. As always, we appreciate your feedback and input as we continue to refine and prioritize system needs and improvement opportunities.

Respectfully,

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

**2003 Public Water
System Award for:
Outstanding Performance
and Achievement in 2002**

2002 Highlights

- ◆ Complete rehabilitation of the **Jennie Dugan Pumping Station** including all mechanical, electrical, and chemical feed systems.
- ◆ Continued participation in an American Water Works Research Foundation **Ultra-violet Treatment Research Initiative** for optimizing disinfection—in collaboration with Massachusetts Water Resources Authority, Southern Nevada Water Authority, and Environmental Protection Agency.
- ◆ **Full compliance** with the first phase of the "Stage 1 Disinfection Byproduct Rule" (DBPR), "Unregulated Contaminant Monitoring Rule" (UCMR), and ongoing "Lead and Copper Rule" (LCR).
- ◆ **Rehabilitation** of over 3,600 ft. of water main.
- ◆ A state-of-the-art pump station instrumentation and control (**SCADA**) system was successfully installed and activated at three water stations and two storage reservoirs.
- ◆ The **Pine Hill and Annursnac Hill** reservoirs were cleaned and inspected.

Water Supply

Concord's water system consists of six groundwater supply wells and one surface water supply, pumping stations, two storage reservoirs with a 7.5 million gallon capacity, and approximately 121 miles of water main. Depending on the season, all available production facilities may be called upon to satisfy system demands which fluctuate between 2 million gallons per day (MGD) during the winter months to over 5 MGD in the summer. Concord's public water system is interconnected with those of Acton and Bedford for emergency backup, if ever needed.

Water Treatment

In accordance with state and federal drinking water requirements, Concord water is treated before it gets to your tap. Treatment includes: corrosion control—via the addition of potassium hydroxide to raise the natural pH of the water and reduce its corrosiveness to household plumbing; disinfection—via the addition of chlorine at all water supplies and ozone at the Nagog Pond water supply; fluoridation—via the addition of sodium fluoride to help in the prevention of tooth decay; and iron sequestration—by adding polyphosphate or sodium silicate to reduce the frequency of discoloration events.

SOURCE TREATMENT							
	Nagog Pond Acton, MA	Second Division Well	Deaconess Well	Robinson Well	Jennie Dugan Well	White Pond Well	Hugh Cargill Well
pH Adjustment for Corrosion Control	•	•	•	•	•	•	•
Chlorine for Disinfection	•	•	•	•	•	•	•
Ozone for Disinfection	•						
Fluoride to Promote Strong Teeth	•	•	•	•	•	•	•
Polyphosphate for Iron & Manganese Treatment	•	•	•	•	•	•	•
Sodium Silicate for Iron & Manganese Treatment & Corrosion Control			•				

Potential Sources of Contaminants

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 dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity.

Contaminants that might be expected in untreated water include: biological contaminants such as viruses and bacteria; inorganic contaminants, such as metals and salts; pesticides and herbicides; organic chemicals from industrial or petroleum use; and radioactive materials.

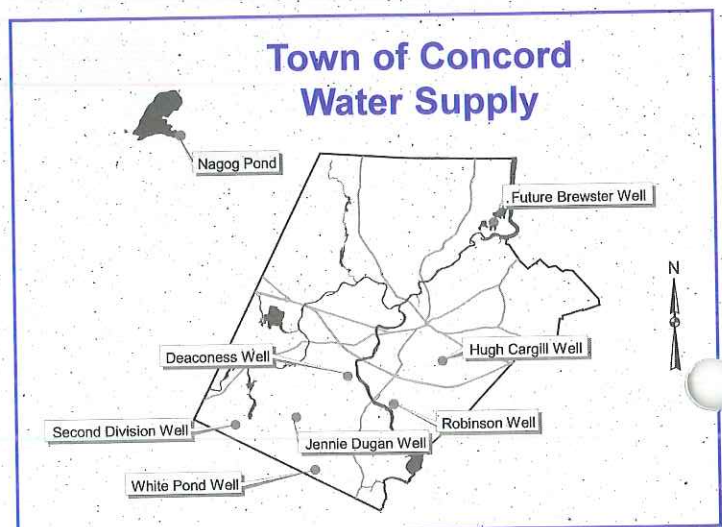
Drinking water, including bottled water, may reasonably be expected to contain at least some small amounts of certain substances which the EPA calls "contaminants." The presence of these substances does not necessarily indicate that the water poses a health risk. For example, naturally occurring dissolved 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 800-426-4791.

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 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.



WATER QUALITY SUMMARY

Listed below are the substances detected in Concord's drinking water during 2002 that are required for reporting. 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. **A complete listing of secondary parameters is available on request from CPW.**

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 (EPA's MCLG)	Major Sources in Drinking Water
Barium	0.02	ND-0.02	2	2	Erosion of natural deposits
Chlorine	1.5	0.07-1.5	4(MRDL)	No Standard(MRDLG)	Water treatment for disinfection
Haloacetic Acids (ppb)	31.1	ND-31.1	60	No Standard	Byproduct of drinking water disinfection
Fluoride*	1.4	0.6-1.4	4	4	Water treatment for tooth decay prevention
Nitrate	1.8	ND-1.8	10	10	Runoff from fertilizer use; Erosion of natural deposits
Radionuclides (pCi/L)	2.9	ND-2.9	15	0	Erosion of natural deposits
Trihalomethanes (ppb)	59	ND-59	80	No Standard	By-product of drinking water disinfection
Turbidity (NTU)**	1.1	ND-1.1	5	No Standard	Soil runoff

SECONDARY PARAMETERS

Calcium	24.7	6.1-24.7	No Standard	No Standard	Erosion of natural deposits
Chloride	99.9	12.3-99.9	250	250	Naturally present in the environment
Chloroform (ppb)	24	ND-24	No Standard	No Standard	By-product of drinking water disinfection
Hardness	88	22-88	No Standard	No Standard	Erosion of natural deposits
Iron	0.8	ND-0.8	0.3	No Standard	Erosion of natural deposits
Magnesium	6.4	1.5-6.4	No Standard	No Standard	Erosion of natural deposits
Manganese	0.21	ND-0.21	0.05	No Standard	Erosion of natural deposits
Potassium	28.4	1.9-28.4	No Standard	No Standard	Naturally present in the environment
Sodium	43	9-43	No Standard	No Standard	By-product of water treatment; Naturally present in the environment
Sulfate	25.5	6.7-25.5	250	No Standard	Naturally present in the environment
Total Dissolved Solids	215	83-215	500	500	Naturally present in the environment
Zinc	0.11	ND-0.11	5	No Standard	Naturally present in the environment

LEAD & COPPER PARAMETERS[†]

Substance	90th Percentile Level Detected	Range of Levels Found	90th Percentile Action Level (EPA's MCL)	Ideal Goal (EPA's MCLG)	Major Sources in Drinking Water
Lead (ppb)	8	ND-25	15	0	Household plumbing, see statement below
Copper	0.33	0.008-0.48	1.3	1.3	Household plumbing, see statement below

Terms and 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. MCLs are set as close to the MCLGs 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. MCLGs 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 health risk. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

pCi/L: picocuries per liter

ppb: parts per billion or micrograms per liter

ppm: parts per million or milligrams per liter

ND: none detected

NTU: nephelometric turbidity units

* **Fluoride:** The Department of Public Health's ideal goal for fluoride is 1 ppm

** **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, CPW performed lead and copper testing in 2002 and is scheduled to test again in 2005. EPA requires that at least 90% of the samples have lead levels below 15 ppb (Action Level).

Important Information from EPA about Lead: Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).

Water Conservation Notes

Our goal is to make water conservation a habit, not an emergency response strategy

Did you know that the average Concord resident uses 81 gallons of water per day? That's 324 gallons per day for a family of four.

The drought of 2002 may be over, but it is still prudent to be water-wise. After all, water is a finite resource and conservation should be practiced year-round. If everybody does their part, Concord will not need to impose mandatory water-use restrictions.

Why Conserve Water?

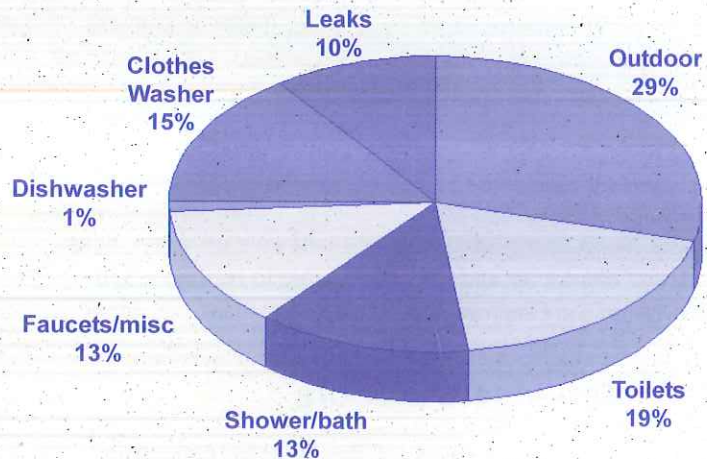
The Town of Concord has a limited supply of water available for use in homes, businesses, and institutions. Increased demand, especially during the summer season, stresses the water supply system. All six groundwater supply wells and Nagog Pond are often required to operate at maximum levels. When this occurs, equipment is prone to more frequent failure, water quality is subjected to greater variation, and production costs are increased.

Conservation, coupled with the development of the new Brewster Well, is integral to the Town's 20-year Water Management Plan.

Sustainable water practices will help ensure that Concordians have an abundant supply of high-quality water season to season from year to year.

Where Your Water Goes

Concord Average Daily Water Use
(81 gallons per person per day)



Conservation at Work

Since Concord Public Works initiated its Comprehensive Water Conservation Program in 1997, the demand for water has been held virtually constant while the number of customers has increased by 6.4% since 1990. Summertime demand is down 4% and the number of peak demand days (over 4 millions gallons/day) has been cut by over 40%.

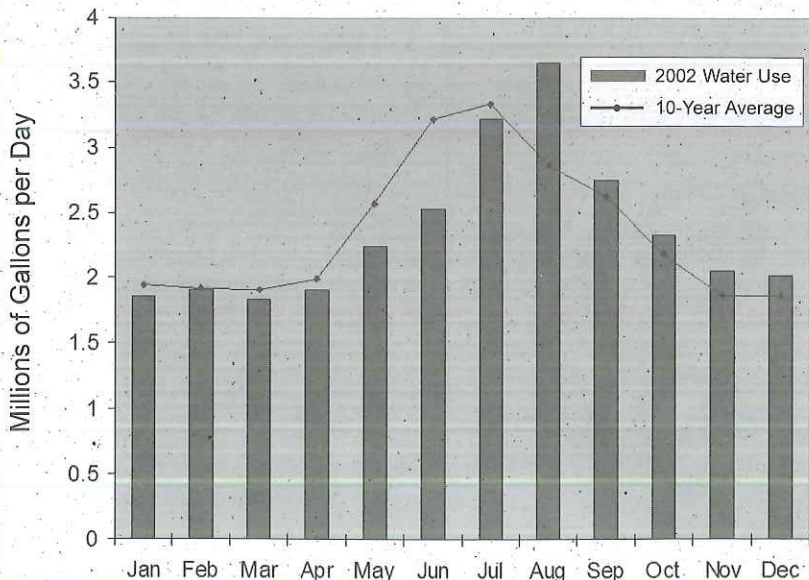
However, there is still room for improvement. As illustrated by the graph to the left, average daily water use since last summer has been

The demand for water has been held virtually constant while the number of customers has increased by 6.4% since 1990.

above the ten-year average. In addition, we are aware that water use limits are being considered that are significantly lower than Concord's daily average of 81 gallons per person per day. It is in our interest to anticipate and plan for regulatory changes as opposed to reacting to them.

Consider adopting the water-wise tips on the next page into your everyday routines. Not only will you conserve water; you will save on your water bills, too.

2002 Average Daily Use vs. 10-year Average Use



Be Water-wise in the House

Fix faulty faucets. Leaky pipes, showerheads, toilets and other plumbing fixtures can waste as much as 100 gallons per day.

Install low-flow showerheads and faucet aerators.

Low-flow showerheads can save 20 to 40 gallons of water during one 10-minute shower. A faucet aerator can reduce water flow by around 25%.

Replace older toilets with newer, low-flow models.

If your toilet is more than 13 years old, it can be using as much as 5 gallons of water per flush, versus 1.6 gallons in today's models.

Replace your clothes washer. Older appliances are thirsty and energy hogs. When the time comes for a new washing machine, consider purchasing a front-loading clothes washer (www.energystar.gov). You will save on water, detergent, and electricity and may be eligible to receive a \$50 rebate from the Concord Municipal Light Plant.

Be Water-wise Outdoors

Limit your lawn. Lawns are desirable for recreation and other purposes, but by limiting lawn area, you can include more interesting, drought-resistant and easy-to-maintain plants in your landscaping plan. Call Joanne Bissetta, Water Conservation Coordinator, at 978-318-3250 or visit www.umassdroughtinfo.org for a list of drought tolerant plants.

Remember to mulch. Place mulch over the soil around plants to reduce evaporation, limit heat stress and inhibit weed growth. Free compost is available to residents at the Town Compost Site on Walden Street near Route 2 from 9 a.m. to 3 p.m. on Saturdays.

Get swept away. Use a broom, not a hose, to clean driveways and sidewalks.

Practice Smart Sprinklering

An inch will do. One or two applications (including rainfall) per week is sufficient for a healthy lawn.

Special Offer

for Concord Residents

Rain Barrels only \$30

Collect rainwater for your garden and plants.



To order, contact the New England Rain Barrel Company at 978-927-0711 or sales@nerainbarrel.com

Delivery date: Thursday, July 17
at CPW 135 Keyes Road

For more information, call CPW at
978-318-3250

Offer expires July 7, 2003

Water only when needed. It might be time to water when grass doesn't spring back when it's walked on. In many cases, lawns only need to be watered once or twice a week.

Wake up and water. Heat and wind steal water from your lawn and garden before it is used by plants. Watering in the morning also helps prevent fungus growth.

A good long drink. Water long enough for the moisture to reach plant roots. This will help plants to develop a deep root system that requires less water in the long run and is more disease-resistant.

Comply with the in-ground irrigation bylaw. Make sure your automatic sprinkler system is registered with the town and is equipped with a moisture sensing device and timers. Call 978-318-3250 or go to www.concordnet.org/dpw for registration forms.

Look for leaks. Check for leaks in pipes, hoses, faucets and sprinkler heads. Leaks outside the house may not be as visible as those inside, but they can be just as wasteful.

CONSERVE WATER

Refrain on Mondays
Water ONLY When Necessary
One inch per week will do
NO Rain?
Follow the **ODD-EVEN** Schedule:

ODD Address — **MONDAY** → **ODD DAYS**

EVEN Address — **MONDAY** → **EVEN DAYS**

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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, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

Guidelines from the Environmental Protection Agency and Centers for Disease Control 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 800-426-4791.

Questions?

For more information about Concord's drinking water and its supply system or if you would like a large-print version of this document, please contact Matthew Mostoller, Environmental Analyst, at 978-318-3250 or visit our Web site at www.concordnet.org.

For information on State and Federal drinking water regulations call the EPA's Safe Drinking Water Hotline at 800-426-4791 or the Massachusetts Safe Drinking Water Hotline at 617-292-5770.