



WATER QUALITY ANNUAL REPORT

CONCORD PUBLIC WORKS - 2004

To Our Customers

During the 2003 calendar year, Concord's drinking water quality continued to meet or surpass state and federal drinking water standards as they relate to public health and safety. In addition to providing a water system overview and detailed water quality data, the attached report has been expanded to include timely and important information regarding conservation and water-use issues.

The Massachusetts Department of Environmental Protection has recently introduced new, aggressive water management guidelines for communities throughout the state. Specific attention has been placed on summertime, non-essential water use practices including outdoor irrigation as well as per capita water allowances. It is clear that the goal is to reshape residential water use behavior and consumption.

Over the past few years, Concordians have increased their conservation awareness and have modified water-use practices accordingly. It is already making a difference. Concord's rain barrel program was recognized as one of the most successful programs of its kind in the state. As our conservation program evolves and interest grows, we will continue to look for creative and effective ways to provide conservation opportunities and incentives.

As part of ongoing efforts to improve water quality within our distribution system, Tata & Howard, Inc. will complete the design for two full-scale pumping and treatment facilities to be constructed at the Deaconess well and the proposed Brewster well site. After learning that both supplies have similar treatment needs, we have been able to combine the design, bid and construction activities into one project. This consolidation will significantly reduce costs to the town.

If you have received this update in the past, you will note that the format of the water quality data allows easy comparison with prior water quality reports.

Should our water supply ever be compromised, a communication system is in place to provide you with immediate notification if required. *As always, we appreciate your 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 Highlights

- ◆ State regulators and Division staff completed a comprehensive **Source Water Assessment and Protection Program**.
- ◆ A prolonged **pump test** was completed at the Brewster well site located on the former Benson property.
- ◆ The **Second Division Pumping Station was refurbished** including all mechanical, electrical, and chemical feed systems.
- ◆ CPW continued participation in an American Water Works Research Foundation **UV treatment research** initiative for optimizing disinfection at Nagog Pond surface water supply.
- ◆ Over **2,000 feet of water main was refurbished** with 815 feet of new main added to our system.

Water Treatment

In accordance with state and federal drinking water requirements, Concord water is treated before it gets to your tap. Treatment includes: *disinfection*—via the addition of chlorine at all groundwater supplies and ozone and ultraviolet light plus chlorine at the Nagog Pond water supply; *corrosion control*—via the addition of potassium hydroxide to raise the natural pH of the water and reduce its corrosiveness to household plumbing; *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.

Potential Sources of Contaminants

Sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, 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 that the U.S. Environmental Protection Agency (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.



Located in Acton and Littleton, Nagog Pond is one of the sources of Concord’s drinking water.

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.

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 website 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.

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	•	•	•	•	•	•	•
Ultra Violet Light for Disinfection	•						
Chlorine for Disinfection	•	•	•	•	•	•	•
Ozone for Disinfection	•						
Fluoride to Promote Strong Teeth	•	•	•	•	•	•	•
Polyphosphate for Iron & Manganese Treatment	•	•	•	•	•	•	•
Sodium Silicate for Iron & Manganese Treatment & Corrosion Control			•				

WATER QUALITY SUMMARY

Listed below are the substances detected in Concord's drinking water during 2003 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	0.04	ND-0.04	2	2	Erosion of natural deposits
Chlorine	1.45	0.02-1.45	4(MRDL)	No Standard(MRDLG)	Water treatment for disinfection
Fluoride*	1.2	ND-1.2	4	4	Water treatment for tooth decay prevention
Haloacetic Acids (ppb)	1.7**	ND-33	60	No Standard	Byproduct of drinking water disinfection
Nitrate	1.4	0.1-1.4	10	10	Fertilizer runoff; Erosion of natural deposits
Radionuclides					
Alpha emitters (pCi/L)	1.2	1.2	15	0	Erosion of natural deposits
Beta emitters(pCi/L)***	19	19	50	0	Decay of natural and man-made deposits
Trihalomethanes (ppb)	8.4**	1.2-86.1	80	No Standard	By-product of drinking water disinfection
Turbidity (NTU)****	1.6	0.15-1.6	5	No Standard	Soil runoff

SECONDARY PARAMETERS

Calcium	22.5	5.5-22.5	No Standard	No Standard	Erosion of natural deposits
Chloride	86.3	5.9-86.3	250	250	Naturally present in the environment
Hardness	78	19-78	No Standard	No Standard	Erosion of natural deposits
Iron	0.8	0.04-0.8	0.3	No Standard	Erosion of natural deposits
Magnesium	5.3	1.2-5.3	No Standard	No Standard	Erosion of natural deposits
Manganese	0.27	0.01-0.27	0.05	No Standard	Erosion of natural deposits
Potassium	34.1	0.9-34.1	No Standard	No Standard	Naturally present in the environment
Sodium	42.7	4.2-42.7	No Standard	No Standard	By-product of water treatment; Naturally present in the environment
Sulfate	29.9	5.3-29.9	250	No Standard	Naturally present in the environment
Total Dissolved Solids	243	53-243	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.

** **Haloacetic Acids and Trihalomethanes:** The highest level detected represents the highest running annual average for these contaminants. The range of levels found may have results in excess of the MCL but the running annual average of all sample locations is used to determine compliance.

*** **Beta Emitters:** The MCL for beta particles is 4 mrem per year. EPA considers 50 pCi/L to be the level of concern for beta particles.

**** **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 disinfectant processes.

[†] **Lead and Copper:** In accordance with EPA regulations, CPW tests tap water in 30 homes in Concord for lead and copper every 3 years. Testing was last done in 2002 and is scheduled for 2005. EPA determines whether protection against corrosion is sufficient by requiring that at least 90% of sampled homes have lead levels under 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

Let's make water count

With the help of above-average rainfall, Concord residents used nine percent less water in 2003 than in 2002. As we enter the "peak" water season of 2004, we again remind our customers to use water efficiently. Increased water demand, especially in the summer, can stress Concord's water supply system. All six groundwater supply wells and Nagog Pond are often required to operate at maximum levels. When this occurs, there is more wear and tear on pumps, water quality is subjected to greater variation and production costs are increased.

Being "water-efficient" means using less water to provide the same benefit. There are many ways to enhance your water efficiency—detecting and fixing leaks, installing high-efficiency clothes washers and toilets, and watering the lawn and garden with the minimum amount of water needed.

Many Concord customers are already integrating water-efficient practices into their daily lives. Last year residents purchased 293 rain barrels to harvest rainwater from their roofs for use in plants and gardens. Thirty-nine households have participated in a free home-water-use audit. Households audited in 2002 used an average of **27 percent less water** in 2003 in comparison with the nine percent reduction town-wide.

New in 2004 is the residential toilet replacement rebate program in which up to \$75 of the cost for a new, low-flow toilet is rebated for each older, high-volume toilet replaced.

Take advantage of these opportunities to conserve water and reduce water bills. Contact Water Conservation Coordinator, Joanne Bissetta, at 978-318-3250 for further information.

Take a "Virtual" Tour of the Water Saver Home

Learn more about what you can do in and around your home to use water more efficiently. Visit the Water Saver Home on the Internet.

Go to the Concord Public Works main page at www.concordnet.org/cpw and scroll to "Water and Sewer."

Click on "Conservation" and look for the Water Saver Home logo.



Special Offer

for Concord Residents

Rain Barrel only \$40

Additional barrels \$62 each

Collect rainwater for your garden and plants.

To order, contact the New England Rain Barrel Company at 978-977-3135 or www.nerainbarrel.com

Pick-up date: Wednesday, May 5 at CPW, 135 Keyes Road

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

*Ordering deadline is
April 26, 2004*



We Make House Calls

Want to save water but aren't sure how to start? Concord Public Works will send a certified water-use expert to your home to conduct a **free water-use audit**. You will receive a computer printout documenting your household's water consumption and conservation recommendations, complete with estimated savings. Call Energy New England at 888-772-4242 to schedule an audit today.

Is a Xeriscape Right for You?

Learn how to design an attractive, water-conserving landscape right in your own backyard. A colorful, inviting xeriscape can reduce outdoor water use by 30 to 80 percent by incorporating native and adapted plants suited to the region's soil and climate types.

An instructional video, "Your Own Backyard: A Xeriscape Primer," produced for the American Water Works Association, will be broadcast on CTV8, Concord's local cable channel, throughout the spring. Check local listings for dates and times.

on News and Notes

Conservation a habit!

Seasonal Rates Start May 1

From May 1 to October 31, Concord's Water Conservation Rate will be in effect for residential customers. Water customers using more than 2,400 cubic feet of water bimonthly (more than 300 gallons per day) will pay higher rates for their extra consumption, reflecting the higher cost of meeting peak water demand.

Below are proposed rates, effective June 1, subject to Public Works Commission approval.

- ◆ **Base Rate:** \$3.13 per 100 cubic feet (ccf) bimonthly.
- ◆ **Step 2:** \$5.48 per ccf for 2,500 - 4,800 cubic feet bimonthly May 1 through October 31.
- ◆ **Step 3:** \$6.74 per ccf over 4,800 cubic feet bimonthly May 1 through October 31.

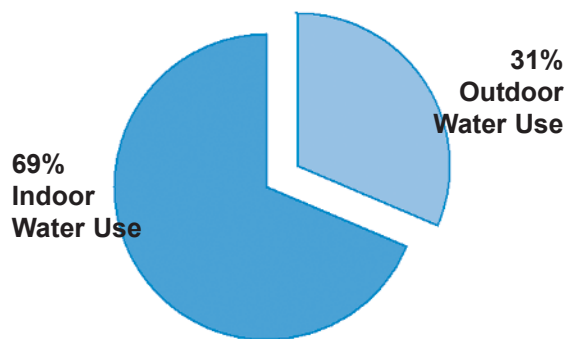
Approximately two-thirds of Concord residential customers stay within the base rate while up to 12 percent pay the highest peak rate.

Beat the Peak

Cutting down on lawn watering will reduce your water bills and conserve drinking water for its purpose—drinking. To save money and water, keep the following in mind:

- ◆ **Healthy lawns only need one inch of water per week—including rainfall.** So even if it is your “day” to water, consider whether it has recently rained or if rain is forecast before you turn on your sprinkler. A hearty rain can eliminate the need for watering for up to two weeks. Keep track of rainfall with a free rain gauge from Concord Public Works.
- ◆ **Replace some or all of your lawn with attractive, low-maintenance, drought-tolerant plants.** Keep the lawn you need for recreational purposes but do you really need all that grass? (Think about all the mowing!) Get a free guide to water-efficient landscaping from Concord Public Works. Check Concord CTV8 listings for broadcasts of our xeriscaping video this spring.
- ◆ **Aerate your lawn** to prevent runoff and give water easier access to root systems.
- ◆ **Mow high.** Keep your lawn 2.5 to 3 inches high to encourage a stronger root system, reduce evaporation, and crowd out weeds.
- ◆ **Fertilizers increase water consumption.** Apply the minimum amount needed. Better yet, use compost. Not only

Household Water Usage



According to a study conducted by the American Water Works Association, the average household uses approximately 31 percent of its water outdoors—mostly for watering lawns, plants and gardens

will it add nutrients to your soil; it will enhance its texture and ability to retain moisture. Screened compost is available free of charge for Concord residents at the Composting Site on Walden Street.

- ◆ **Collect rainwater** from your downspouts to use in your garden. Order a rain barrel now by calling 978-977-3135 or go to www.nerainbarrel.com.

In-ground Irrigation Bylaw

Town bylaw requires that all in-ground irrigation systems connected to the public water supply be registered with the Town and equipped with automatic timers, rain sensors and backflow prevention devices. Call 978-318-3250 or go to www.concordnet.org/cpw for registration forms.

Free Healthy Lawn Workshop

Is your lawn addicted to chemicals? Are you tired of spending time and money on lawn maintenance? Find out how you can have a beautiful yard without using chemicals that could harm children, pets and Concord's wetlands, waterways and aquifers.

On Thursday, May 6, Ann McGovern of the Department of Environmental Protection will present a free Healthy Lawns and Landscapes Workshop. The workshop will be held from 7 to 9 p.m. at the Concord Municipal Light Plant, 1175 Elm Street (Route 2A). Call Joanne Bissetta, 978-318-3250 to register.

Irrigation System Tune Up

If you have an automatic in-ground irrigation system, make sure it is using water efficiently:

- ◆ Don't water the street, driveway, house or sidewalk.
- ◆ Check for leaks.
- ◆ Make sure your rain sensor is operating properly.
- ◆ Adjust your controller to reflect current weather and growing needs.
- ◆ Prevent runoff by watering only as rapidly as the soil can absorb it. If water puddles or runs off your lawn, allow water to soak in then water again later.
- ◆ Only water your lawn once or twice a week to encourage deep roots that are drought and disease resistant.

May 1 Well Tour

Ever wonder what goes on inside those little brick buildings housing the Town's wells? Here's your chance to have a peek inside.

The Hugh Cargill Pump Station, located at 416 Walden Street will be open to the public on May 1. After serving as an emergency source of water for several years, the well was totally refurbished and 10 smaller cluster wells were installed to replace the original well. The well was returned to regular service in August 2001.

Water Saving Devices — Free!

Concord Public Works wants to help you conserve water. Bring your water bill to our office at 135 Keyes Road weekdays from 7:30 a.m. to 4 p.m. or call Joanne Bissetta, Water Conservation Coordinator, at 978-318-3250. Call today, supplies are limited.

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.

Low-flow Showerhead. An attractive, high-quality showerhead that uses 2.0 gallons per minute that doesn't feel "low-flow." Cut shower water use in half.

Shower Timer. Helps you keep showers to five minutes.

Bathroom Flip Aerator. Temporarily halt the flow of

Stop flushing cash down the drain!

Have an old toilet?

Install a new, low-flow toilet and save on water and sewer bills

—and get a rebate.

Call 978-318-3250 for more information.



Tours are scheduled for 11:30 a.m., 12:30 p.m., and 1:30 p.m. on Saturday, May 1 (same day as Musketquid Earth Day Celebration).

Weather, Watersheds, and Water Quality

Learn how stormwater runoff affects local waterways and steps you can take to reduce pollution. Tune

into the Weather Channel to view a half-hour program called "After the Storm." It will be broadcast four times this spring: 8:30 and 11:30 p.m. on Sunday, May 9; and 8:30 and 11:30 p.m. on Saturday, June 26.

Co-produced by the Weather Channel and the Environmental Protection Agency, "After the Storm" shows the connection between weather and watersheds.

Whenever it rains, pollutants from city streets, suburban lawns and farms can be carried into water bodies. The program reminds viewers that a finite amount of fresh water exists on the planet, and that everyone needs to take action to protect water resources.



water with a flip of the switch without readjusting temperature controls. Great for shaving and brushing teeth.

Dual Setting Kitchen Flip Aerator. 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.

EPA Guidebook on Water-Efficient Landscaping.

Easy-to-read instructions on how to create eye-catching gardens that save water, prevent pollution and protect the environment. You can view or print out the booklet at www.epa.gov/owm/water-efficiency or call us for a copy.

Residential Water Audit. Have a certified auditor visit your home and help you find ways to save water.

Presentations to Local Groups. Concord Public Works staff members are available to come to your organization to talk about water conservation. Give us a call!

Source Water Assessment and Protection Program

Concord Public Works and the Department of Environmental Protection (DEP) prepared a Source Water Assessment and Protection Program (SWAP) report for the water supply sources serving Concord's water system. This report was finalized in 2003 as part of a statewide initiative to identify activities and hazards in the recharge areas of drinking water sources.

The SWAP Report notes the key issues of storm water management, spill/release response, activity control, and public education, outreach, and partnerships. The report commends Concord Public Works on adopting and revising a groundwater conservancy district, developing and implementing a toxic and hazardous waste materials by-law, conducting joint audits with the Board of Health, protecting watershed areas through land acquisitions, and development of a comprehensive waste water management plan. At Nagog Pond, located in Acton and Littleton, DEP praised the advanced water quality monitoring program and the diversion of Route 2A drainage away from Nagog Pond.

Concord Public Works continues to protect groundwater and surface water resources by conducting regular inspections of the watershed areas, educating residents and property owners about watershed protection, monitoring the progress of release sites located in the resource protection areas, working with farmers to practice Best Management Practices (BMPs), and implementing an enhanced emergency response plan.

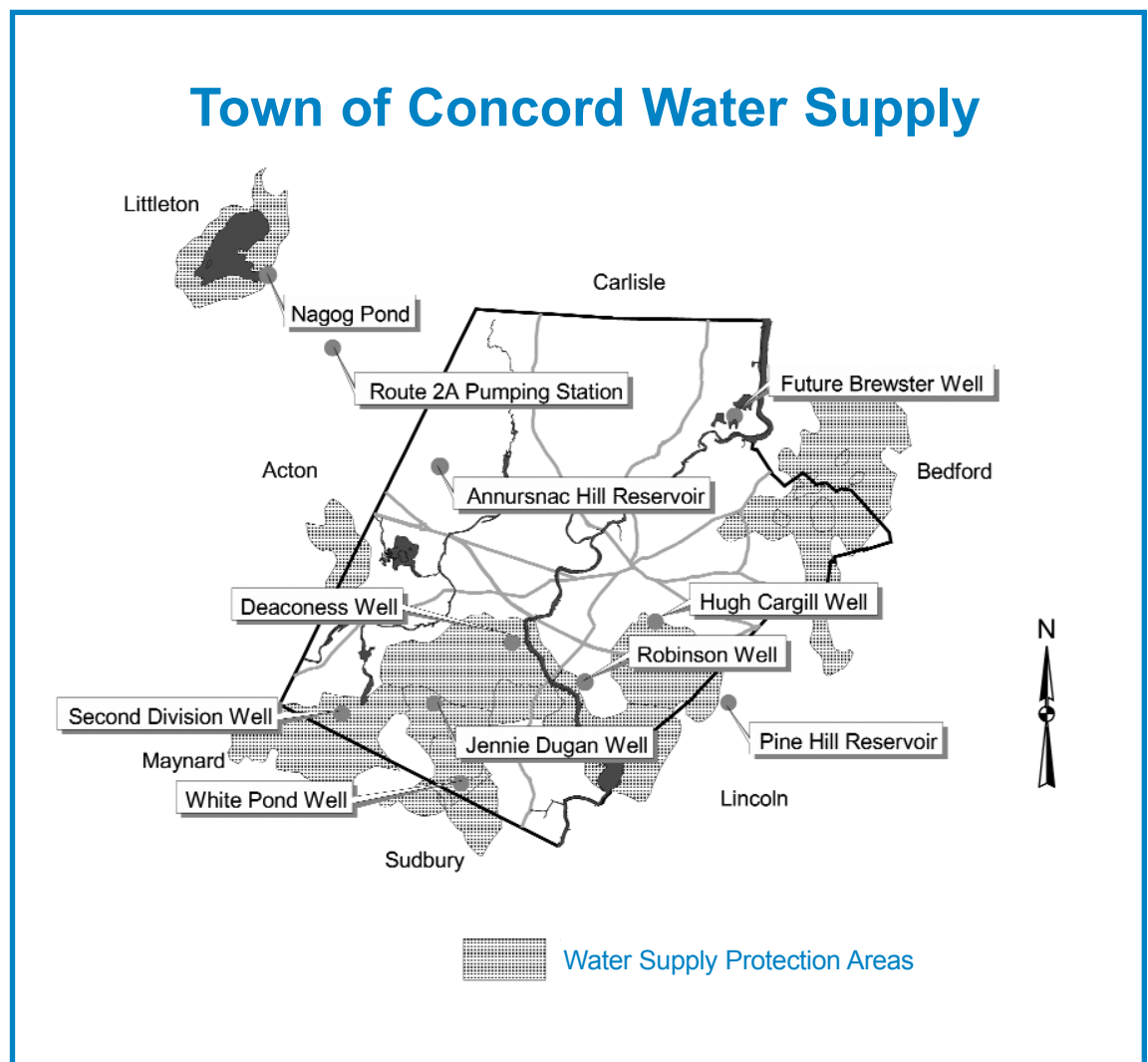
Residents can help protect drinking water resources by observing good septic system practices, supporting water supply protection initiatives at the local and state level, taking hazardous household

chemicals to proper hazardous materials collection facilities, and limiting the use of pesticides and fertilizer.

The complete SWAP report is available at the Water and Sewer Division of Concord Public Works and online at www.concordnet.org/cpw. For more information on SWAP and what is being done to protect your drinking water, please contact Matthew Mostoller, Environmental Analyst at 978-318-3250 or visit www.state.ma.us/dep/brp/dws.

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 1.5 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.



CONCORD PUBLIC WORKS - 2004

WATER QUALITY ANNUAL REPORT



Printed on 100% Recycled Paper



Postal Patron
Concord, MA 01742

Presort Standard
U.S. Postage Paid
Concord, MA
01742
Permit No. 20

CONCORD PUBLIC WORKS
Water/Sewer Division
PWS ID 3067000
135 Keyes Road
Concord, MA 01742



Spring Calendar

- April 26** Deadline for ordering rainbarrels
- May 1** Hugh Cargill Wellfield Tours, 11:30 a.m., 12:30 p.m., and 1:30 p.m.
- May 1** Seasonal water rates go into effect.
- May 5** Rain barrel pick-up at Concord Public Works, 135 Keyes Road.
- May 6** Healthy Lawns and Landscape Workshop, 7 p.m., Concord Municipal Light Plant, 1175 Elm Street.
- May 9** "After the Storm," on The Weather Channel, 8:30 p.m. and 11:30 p.m.
- June 26** "After the Storm," on The Weather Channel, 8:30 p.m. and 11:30 p.m.

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.