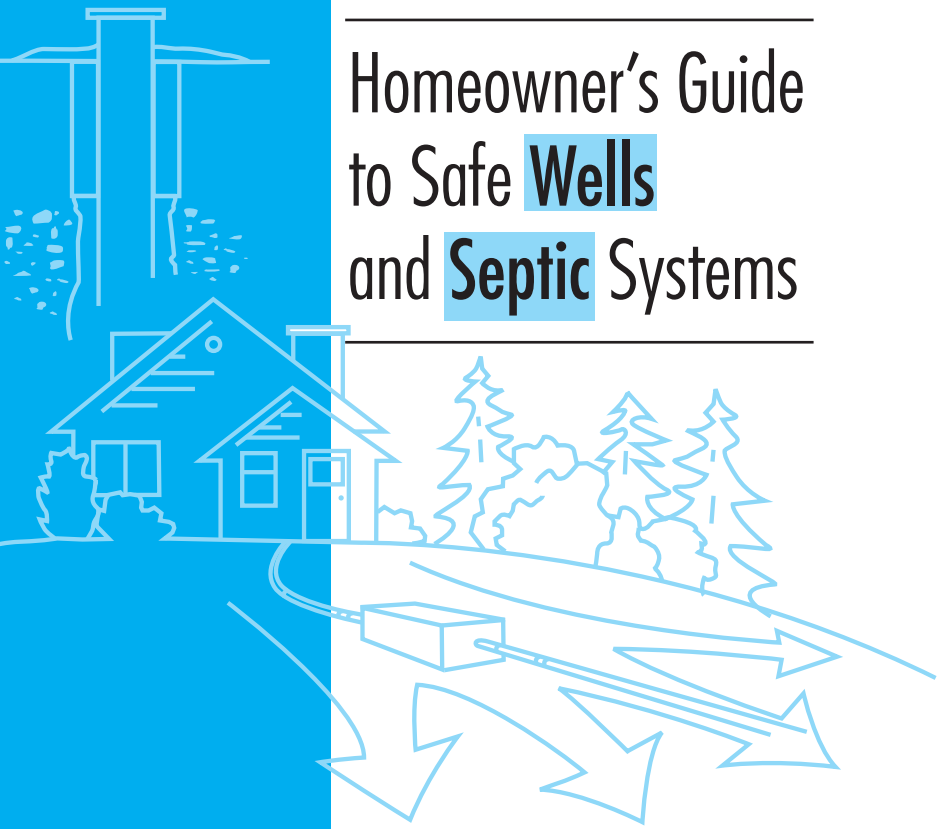
H2O des Collines

www.h2o.mrcdescollinesdeloutaouais.qc.ca

HOW WELL IS YOUR WELL?

Homeowner's Guide to Safe Wells and Septic Systems



"How Well Is Your Well" is an initiative of the H_2O des Collines project and is made possible with the financial support of:

Affaires municipales, Régions et Occupation du territoire
Québec

RBC Blue Water Project

For residents of MRC des Collines-de-l'Outaouais

Acknowledgements

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Canadian Institute of Public Health Inspectors

Environment Canada

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MRC des Collines-de-l'Outaouais

Municipalities of Cantley, Chelsea, L'Ange-Gardien, La Pêche, Notre-Dame-de-la-Salette, Pontiac and Val-des-Monts

Ontario Federation of Agriculture

Ontario Ministry of the Environment

Ontario Ministry of Agriculture and Food

Funding for this booklet provided by the Ministère des Affaires municipales, des Régions et de l'Occupation du territoire's *Laboratoires ruraux* program, the Pacte rurale funding program of the MRC des Collines-de-l'Outaouais and the RBC Blue Water Project™.

Note to reader: This document is provided for illustrative purposes only. It is recommended that you consult with the relevant legal documents to confirm the accuracy of the information and standards described within.

The coordination of the H_2O des Collines project is provided by WESA Envir-Eau.

WESA Envir-Eau
L'environnement, un choix d'affaires

Aussi disponible en français: *Guide du propriétaire de puits et d'installations septiques*

H_2O des Collines Community Water-Monitoring Project:
www.h2o.mrcdescollinesdeloutaouais.qc.ca

June 2009

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The H_2O des Collines project

H_2O des Collines is a community-based water research and monitoring project developed collaboratively by the MRC des Collines-de-l'Outaouais and the Municipalities of Cantley, Chelsea, L'Ange-Gardien, La Pêche, Notre-Dame-de-la-Salette, Pontiac and Val-des-Monts. The goal of the program is to develop a better understanding of ground and surface water resources in the MRC des Collines de l'Outaouais that will inform sustainable planning and management decisions. H_2O des Collines is based on the award-winning H_2O Chelsea project.

H_2O DES COLLINES

The six-year pilot project was selected for funding in 2008 by the Ministère des Affaires municipales, des Régions et de l'Occupation du territoire's *Laboratoires ruraux* program. Funding was also secured from the RBC Blue Water Project™ and the Walter & Duncan Gordon Foundations. A key objective of the project is to develop a water governance model that will be transferred to other MRC governments in Québec.

The H_2O des Collines project will be volunteer-driven and will rely on the commitment of the MRC des Collines-de-l'Outaouais' residents as well as employees from the participating municipalities and MRC government. Partnering organizations will include: Action Chelsea for the Respect of the Environment, Centre local de développement des Collines de l'Outaouais, le Comité de bassin versant de la rivière Gatineau, le Comité de bassin versant de la rivière Lièvre, Conférence régionale des Élus de l'Outaouais, le Conseil Régional de l'environnement et du développement durable de l'Outaouais, Direction de santé publique de l'Outaouais, Fédération des lacs de Val-des-Monts and other participating lake associations, Health Canada, l'École Secondaire Lacs de La Pêche, Ministère du Développement Durable, Environnement et Parcs Québec, National Capital Commission, University of Ottawa, Université du Québec en Outaouais, and WESA Envir-eau.

Monitoring and research activities

H_2O des Collines Program	What is Analysed
Well Water Quantity	Water Consumption, Water Levels of Wells
Well Water Quality	Bacteria, Metals, Water Hardness, etc.
Lake Sampling	Bacteria, Nutrients, Suspended Solids, etc.
River and Stream Sampling	Bacteria, Nutrients, Suspended Solids, etc.
Water Survey of Residents	Water Quality and Quantity of Water Resources

The H_2O des Collines project

An important aspect of the H_2O des Collines project is our focus on community-based education (lecture series, community events etc.). Our aim is to provide MRC des Collines-de-l'Outouais residents with information and resources that will promote better water-stewardship practices.

H_2O des Collines will advertise its events on the project website [*www.h2o.mrcdescollinesdeloutaouais.qc.ca*], in our e-newsletter and in municipal newsletters and websites. We look forward to seeing you at our next event!

The H_2O des Collines steering committee would like to thank the project funders and the residents of the seven municipalities of the MRC des Collines for their generous support of this community-based water governance project.

To learn more about the H_2O des Collines project and how you can get involved, please consult our project website [*www.h2o.mrcdescollinesdeloutaouais.qc.ca*] or call us at (819) 457-2121 ext. 232, toll free 1-877-457-2121 ext. 232 or email us at *H2OdesCollines@mrcdescollines.com*.

H_2O des Collines was created after the great success of the H_2O Chelsea project. H_2O Chelsea is a community-based water research and monitoring program developed collaboratively by the Municipality of Chelsea, the University of Ottawa's Institute of the Environment and Action Chelsea for the Respect of the Environment (ACRE). Established in 2003, the objective of the project is to develop a better understanding of ground and surface water resources in Chelsea to inform municipal planning and management decisions. The project is volunteer-driven, relying on the commitment of local residents, municipal employees and University of Ottawa professors and students.

Where to find help

Agency	Services
H_2O des Collines Tel.: (819) 457-2121 ext. 232, 1-877-457-2121 ext. 232 (toll free) 1694, montée de la Source Cantley (Québec) J8V 3H6 *www.h2o.mrcdescollinesdeloutaouais.qc.ca*	H_2O des Collines project information; water analysis procedures and results for wells, lakes and streams; septic and well information; waterfront best practices, volunteer opportunities and local events.
Municipality of Cantley Tel.: (819) 827-3434 8, chemin River Cantley (Québec) J8V 2Z9 *www.cantley.ca*	Well-drilling and septic permits, municipal septic tank emptying program (Chelsea and L'Ange-Gardien only), septic tank emptying requirements, municipal by-laws and environmental initiatives.
Municipality of Chelsea Tel.: (819) 827-1124 100, ch. Old Chelsea Chelsea (Québec) J9B 1C1 *www.chelsea.ca*	
Municipality of L'Ange-Gardien Tel.: (819) 986-7470 870, chemin Donaldson L'Ange-Gardien (Québec) J8L 2W7 *www.ville.lange-gardien.qc.ca*	
Municipality of La Pêche Tel.: (819) 456-2161 1, rue Principale Ouest, C.P. 70 La Pêche (Québec) J0X 2W0 *www.villelapeche.qc.ca*	
Municipality of Notre-Dame-de-la-Salette Tel.: (819) 766-2533 45, rue Des Saules Case postale 59 Notre-Dame-de-la-Salette (Québec) J0X 2L0	
Municipality of Pontiac Tel.: (819) 455-2401 2024, route 148 Pontiac (Québec) J0X 2G0 *www.munpontiac.com*	
Municipality of Val-des-Monts Tel.: (819) 457-9400 1, route du Carrefour Val-des-Monts (Québec) J8N 4E9 *www.val-des-monts.net*	

Where to find more information

Agency	Services
Local water well drilling companies Consult the Yellow Pages	Sales, servicing, maintenance, repairs
Local laboratories Consult the Yellow Pages	Analysis of well-water quality
Local water treatment device companies Consult the Yellow Pages	Sales, servicing, repairs
Direction régionale du Ministère de l'Environnement Tel. : (819) 772-3434 170, rue de l'Hôtel-de-Ville, bureau 7.340 Gatineau (Québec) *www.mddep.gouv.qc.ca*	Well drilling records, well and septic regulations, guidelines for water quality
Direction de santé publique de l'Outaouais Tel.: (819) 777-3871 104, rue Lois, Gatineau (Québec) *www.santepublique-outaouais.qc.ca*	Water quality guidelines, health effects of water, contaminants, treatment options
Health Canada Water Quality and Health Bureau 2720 Riverside Drive, Ottawa Email: *water_eau@hc-sc.gc.ca*	Water quality guidelines, health effects of water, contaminants, treatment options

Where to find more information

Information on the Web

H_2O des Collines
www.h2o.mrcdescollinesdeloutaouais.qc.ca

Action Chelsea for the Respect of the Environment
www.acrechelsea.qc.ca

CLD des Collines-de-l'Outaouais
www.cldcollines.org

Comité du bassin versant de la rivière Gatineau
www.comga.org

Comité du bassin versant de la rivière du Lièvre
www.cobali.org

Conférence régionale des Élus de l'Outaouais
www.cre-o.qc.ca

Conseil Régional en Environnement et du développement durable de l'Outaouais
www.creddo.ca

Fédération des lacs de Val-des-Monts
www.federationdeslacs.ca

MRC des Collines-de-l'Outaouais
www.mrcdescollinesdeloutaouais.qc.ca

Ministère des Affaires municipales, des Régions et de l'Occupation du territoire
www.mamrot.gouv.qc.ca

Ministère du Développement durable, de l'Environnement et des Parcs
www.mddep.gouv.qc.ca

Municipalities of the MRC (see previous page)

National Capital Commission
www.canadascapital.gc.ca

RBC Blue Water Project™
www.rbc.com/bluewater

University of Ottawa's Institute of the Environment
www.ie.uottawa.ca

University du Québec en Outaouais
www.uqo.ca

Walter and Duncan Gordon Foundation
www.gordonfn.org

WESA Envir-eau
www.envireau.ca

Québec

Direction régionale de santé publique de l'Outaouais
www.santepublique-outaouais.qc.ca

Ministère du Développement durable, de l'Environnement et des Parcs Québec (The quality of my well water)
www.mddep.gouv.gc.ca/eau/potable/depliant/index-en.htm

Environment Québec (List of Accredited water testing laboratories by region)
http://www.ceaeq.gouv.qc.ca/accreditation/palae/lla03.htm#outaouais

Federal

Health Canada (Guidelines for Canadian Drinking Water Quality)
http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php

Health Canada (Questions and Answers on Drinking Water Treatment Devices)
http://www.hc-sc.gc.ca/ewh-semt/water-eau/faq_devices-dispositifs-eng.php

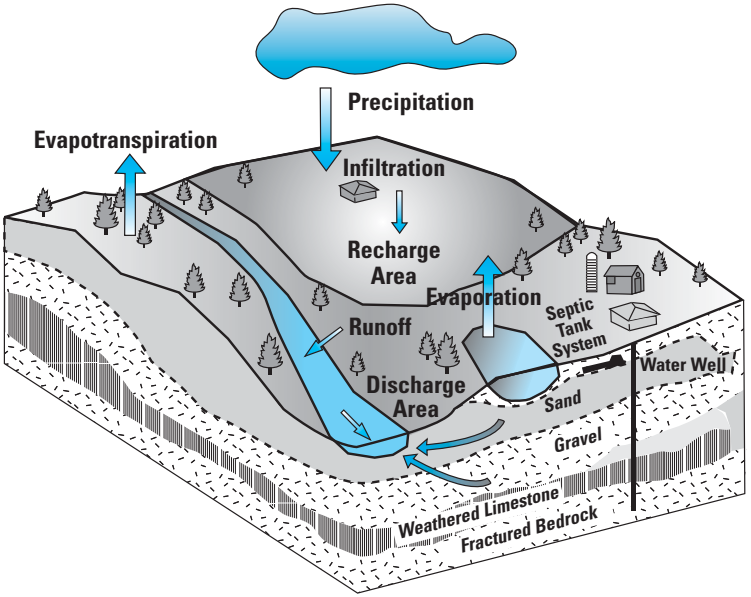
Environment Canada (Freshwater Website)
http://www.ec.gc.ca/water/

Where water comes from

The water we drink generally comes from surface water (above ground) or groundwater (underground). Only about 2.5% of the Earth's water is fresh water.

The water cycle: Rain or melting snow can take several paths. It can runoff into streams, lakes or rivers. It can seep into the ground to be used directly by plants or to recharge groundwater. It can evaporate and return to the atmosphere. The cycle is complete when water in the atmosphere returns to earth as rain or snow. Groundwater from a deep well may have been in the ground for hundreds or thousands of years. In a shallow aquifer, the water may be a few weeks or years old.

The Hydrologic Cycle



Source: Eastern Ontario Water Resources Management Study, completed in March 2001 for the United Counties of Prescott and Russell, the United Counties of Stormont, Dundas and Glengarry, and the City of Ottawa.

All about water

How water moves

Groundwater flows from areas of higher elevation and/or pressure to lower elevation and/or pressure. It can flow horizontally or vertically upward or downward but usually in just one direction. This direction of natural flow can be affected or changed by pumping a well. How fast groundwater moves depends on how porous the soil or rock is, and whether the groundwater surface is sloped. The speed of water movement varies greatly.

The water table: The point at which the ground is saturated determines the water table. This level rises and falls depending on rainfall and local water use. Taking water out of the ground faster than it is recharged by the water cycle will lower the local water table.

Contamination

Is it clean? When an aquifer gets contaminated, the water may be unfit and unsafe to use. Groundwater can become contaminated in several ways:

- spills on the ground, e.g., fuel and pesticide spills
- injection into the ground, e.g., septic leaching beds, disposal of waste in wells, contaminated surface water running into poorly constructed or maintained wells, abandoned (no longer in use) wells that have not been decommissioned or properly decommissioned
- improper handling of industrial solvents and chemicals
- waste leakage, e.g., manure storage, wastewater, septic tanks and landfills
- leaking underground and above-ground fuel storage tanks
- groundwater travelling from contaminated to clean aquifers
- over-application of manure, commercial fertilizers or pesticides

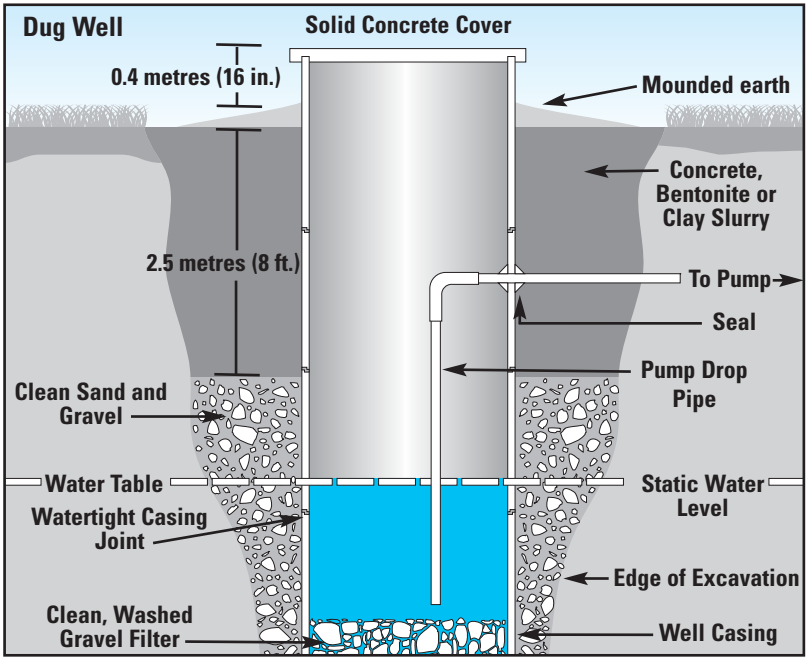
Whether the groundwater gets contaminated depends on:

- the size or strength of the contamination source
- the ease with which the contaminant can move into or travel through the soil

Wells

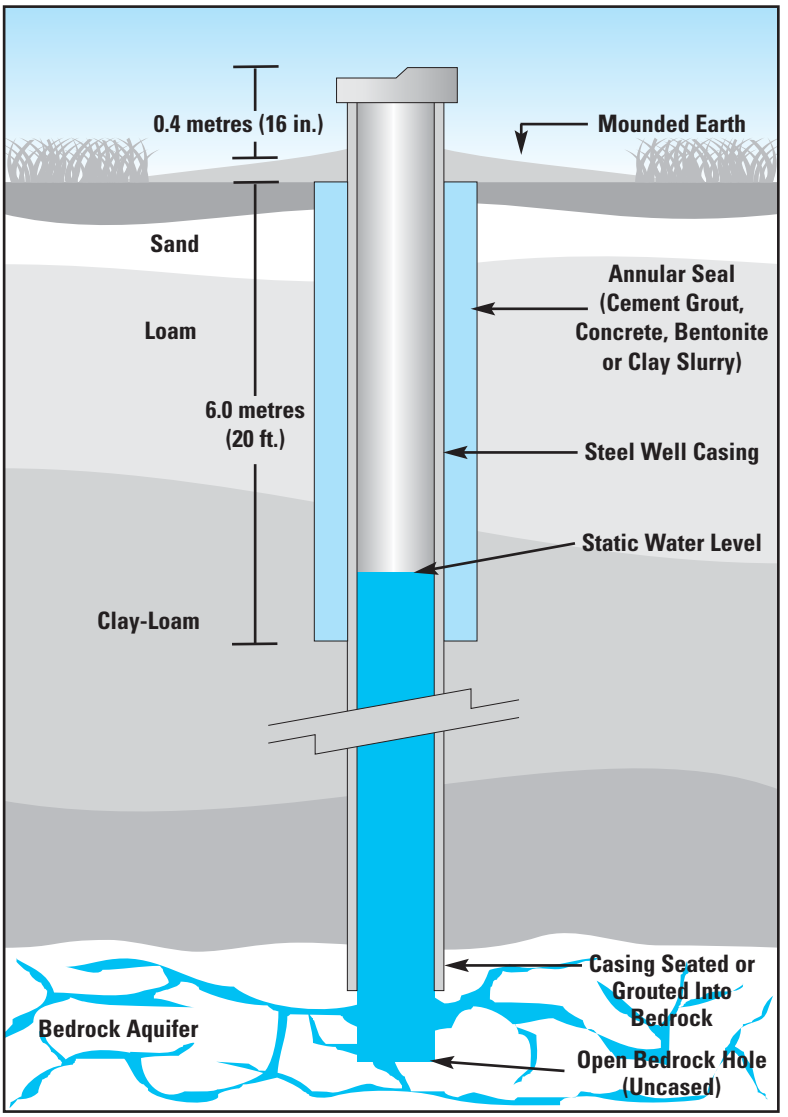
In the MRC des Collines-de-l'Outouais, 97% of residents rely on groundwater (drilled or dug wells) for their household and business water requirements (MDDEP, 2001). Well owners are responsible for ensuring that water from their wells is safe to drink, and that their wells are not contaminating the groundwater. Wells must be properly designed and maintained to ensure that drinking water is safe. If you are a landowner, you should record the location of your well(s). Do a sketch showing the distance to lot lines, buildings, septic tank and system, agricultural fields, oil and fuel storage tanks, and other potential contamination sources. The sketch is helpful in determining sources of contaminants should problems arise. A yearly examination and description of the state of your well(s) should also be done. Keep a record of the construction date, repairs and methods utilized.

Common types of wells: Dug and bored wells (with casings 60 to 120 cm/24 to 48 in.) are less expensive to install than drilled wells. Like sand point wells, dug/bored wells are prone to near-surface contamination and shortages. Drilled wells (casings 10 to 20 cm/4 to 8 in.) cost more but penetrate deeper aquifers.



Source: *Best Management Practices: Water Wells* (Ontario Ministry of Agriculture, Food and Rural Affairs/Agriculture and Agri-Food Canada)

Drilled Well



Source: *Best Management Practices: Water Wells* (Ontario Ministry of Agriculture, Food and Rural Affairs/Agriculture and Agri-Food Canada)

Preventing Contamination of Wells in Agricultural Areas

Below is a summary of the minimum distance requirements between various agricultural activities and a water well.

Agricultural Activities	Minimum Distances from a Well
Spreading of fertilizers	30 m
Livestock farming facility with manure storage	30 m
Livestock farming facility with wintering pen for cattle	75 m
Manure storage directly on soil of a cultivated field	300 m
Waterbody (lake, river, pond)	10 m
Watertight waste water treatment system	15 m
Non-watertight wastewater treatment system	30 m
Active cropland	30 m

Source: Guide techniques Captage d'eau souterraine pour des résidences isolées (MDDEP, 2003).

Bottled water

Bottled water is water sold to consumers in sealed containers. It can be labelled "spring" or "mineral" water. It can be water from various sources including municipal distribution systems that may have been treated to make it suitable for human consumption and put in sealed containers for sale. Some people think that bottled water is safer than municipal tap water, but there is no evidence to support this.

In Canada, pre-packaged water (bottled water) is considered to be a food and is regulated under Division 12 of the *Food and Drug Regulations*. For further information on bottled water, visit "Questions and Answers on Bottled Water in Canada" at: *http://www.hc-sc.gc.ca/fn-an/securit/facts-faits/faqs_bottle_water-eau_embouteillee-eng.php#A1*.

Water from cisterns

The water in cisterns usually comes from rainfall collected off the roof. It is stored in concrete tanks (reservoirs) in the basement or attic. The water collected can be contaminated from many sources (especially bird droppings) and thus is not safe for drinking. If a cistern supply exists or is planned, it is recommended that no connections be made between the main water supply and the cistern. Colour coding of the water pipes is also a good idea to ensure that a separation exists. The use of cistern water is encouraged for such uses as lawn and garden watering and washing cars. Rain barrels offer the same advantages as cisterns, but are easier to install and are available at a much lower cost.

Water conservation

Make the connection: conserve water!

Water is a precious commodity; we all need it to survive. You can help protect one of Earth's most precious resources by conserving water. Many water-efficient devices are available for home use, but they work best together with water-efficient habits. Employ both and you will conserve water, protect the environment and stretch your pocket book.

Water-efficient devices

- An ultra low flush (ULF) toilet uses only six litres of water per flush. A regular toilet uses 20 litres. A ULF toilet can cut household water use by 19% a day.
- Low-flow showerheads and tap aerators can reduce daily water use by 13%.
- A front-loading washing machine uses 38% less water and 56% less energy than a top-loading machine, in addition to eliminating 7% more moisture from wet clothes.

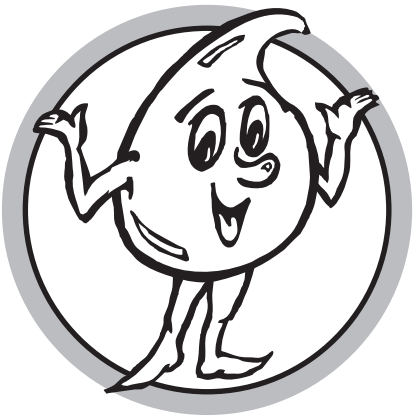
Water-saving habits – indoors

- Take shorter showers or shower the 'Navy-Way'; turn off the water as you soap up, then turn the water back on to rinse off.
- Only fill the tub half-full when taking a bath.
- Don't let the water run unnecessarily (e.g. when you brush your teeth).
- Don't use the toilet as a garbage can; put tissues in the trash can and cigarette butts in the ashtray.
- Keep a container of drinking water in the refrigerator instead of running water to get it cold.
- Scrape dishes instead of rinsing them under running water.
- Load your dishwasher to capacity before running it.
- When doing laundry, select the water-fill level to match the size of the load, or only wash full loads.
- Check faucets and toilets regularly for leaks and have them repaired right away; leaks can account for 10% or more of daily water use.

Water-saving habits – outdoors

- Don't wash your car in the driveway; go to a car wash. The soapy water is often cleaned and recycled instead of draining into the soil.
- If your hoses spring a leak, get them repaired right away; leaks can account for 10% or more of daily water use.
- Use a broom, not a hose, to clean the driveway.
- Use rain barrels to collect rain water. This reduces stormwater runoff and provides water for lawns and gardens.
- When possible, opt for a permeable surface driveway (such as crushed rock, stone dust or interlocking paving stones) to reduce runoff and replenish groundwater.
- Develop natural areas, flower beds and gardens on your property to help reduce runoff and replenish groundwater supplies.
- Incorporate as much wooded area into your property as possible. Added shade from forest cover reduces evapotranspiration from gardens and your lawn, thereby requiring less watering.

Adapted from: Waterfacts. Issue 4, May 2000. City of Guelph; and *Water Quality Review.* Issue 1, 1993. Water Quality Partners in Ottawa-Carleton.



Preventing contamination

How well water gets contaminated

Your well water can be contaminated by:

- openings in the well seal
- improperly installed well casing
- well casing not deep enough
- well casing not sealed
- a source of contamination not related to well construction (e.g. your septic system, pet waste or livestock waste, agricultural or road chemicals)

Preventing contamination

- do not allow liquids or wastes from garbage and manure piles to drain towards the well casing
- do not locate dog runs around the well casing
- do not treat the area around the well with pesticides or fertilizer
- do not flush oils, detergents, paints, solvents or other chemicals down the toilet

Proper installation and maintenance

- sanitary seal or well cap is securely in place and watertight
- cap is at least 30 cm above the ground
- joints, cracks and connections in the well casing are sealed
- surface drainage near the well is directed away from the well casing
- surface water does not pond near the well
- well pump and distribution systems are checked regularly
- changes in the quantity and quality of water are investigated immediately
- well water is tested for bacteria three times a year and after major plumbing work
- wells are chlorinated and tested after any major repairs

Abandoned wells should be carefully sealed to prevent pollution of groundwater and any safety hazards. Hiring a qualified well contractor to seal the well is strongly recommended.

Symptoms and solutions

Common water quality problems

Problem	Possible Cause	Treatment
Health effects: diarrhea, stomach cramps	Bacteria parasites, viruses	1. Chlorination/filtration method 2. Ultra-violet systems 3. Chlorination – injector units
Methaemoglobinemia (blue baby syndrome)	Nitrate	Reverse-osmosis units
High blood pressure	Sodium	Reverse-osmosis units
Scale build-up in kettles and water heaters. Soap scum, bathtub ring.	Hardness (hard water)	Water softeners
Red to brown slime in toilet tanks; iron staining; unpleasant taste or odors	Iron bacteria	Chlorination/filtration units
Rusty and/or black stains on fixtures, laundry	Iron and/or manganese	Filtration; greensand filters; water softeners; chlorination/filtration units
"Rotten-egg" smell and taste	Hydrogen sulphide and/or sulphate reducing bacteria	Chlorination/filtration units; greensand filters; aeration
Water has laxative effects	Sulphate	Reverse-osmosis units
Salty taste, corrosive	Chloride	Reverse-osmosis units
Gassy smell, gas bubbles escaping from water	Gases (methane)	Aeration; activated carbon filters
Cloudy water	Turbidity (clay, silt, fine organic matter)	Filters; alum treatment
Kidney function (detectable only by medical testing)	Uranium	Reverse osmosis, distillation, anion exchange resins

Water testing

Why should you test your well water?

Drinking contaminated water can make you sick and can even be fatal. Bacterial contamination causes stomach cramps and/or diarrhea as well as other problems. Chemical contamination is equally dangerous.

Make sure your water supply is safe to drink by testing it regularly – **test for bacteria three times a year and after major plumbing work**. We also recommend testing for nitrates, metals and other contaminants once a year.

Note: The bacterial stability of water cannot always be determined from a single sample. To establish drinking water quality, initially submit 3 samples at least one week apart. If the well shows acceptable coliform/E.coli counts, then sample three times a year. Do not send several samples at the same time.

Visit the H_2O des Collines website [*www.h2o.mrcdescollinesdeloutaouais.qc.ca*] to find out when the well water quality testing programs being developed by the H_2O des Collines project will be available to MRC des Collines residents. Until these programs are available, residents are encouraged to sample their well water through a laboratory accredited by the Ministère du Développement durable, de l'Environnement et des Parcs Québec (MDDEP). Consult the Yellow Pages to access contact information for local laboratories.

Information regarding available tests, prices, and sampling procedures will be included on the project website in the coming months.

Water quality test results

Please visit the H_2O des Collines website [*www.h2o.mrcdescollinesdeloutaouais.qc.ca*] for updated information on how to interpret your well water test results.

If you are concerned about the possible health impacts related to the quality of your well water, contact Health Canada at (613) 957-2991, or the Direction de santé publique de l'Outaouais at (819) 777-3871.

Bacterial test results

See page 19 for interpretation of numeric results.

Total coliforms

This group of bacteria is always present in animal wastes and sewage, but is also found naturally in soil and on vegetation. The presence of these bacteria in your well water may indicate that surface water is getting into your well.

Fecal coliforms (e.g. *E. coli*)

These bacteria are found only in the digestive systems of humans and animals. Their presence in your well water is usually the result of contamination by manure or human sewage from a nearby source such as a septic system or feedlot.

Nitrates

Nitrates are the end result of a chemical reaction; they are not bacteria. The presence of nitrates in your well water is usually the result of residential yard or agricultural fertilizers or seepage from septic tanks. Infants less than six months old can become sick from drinking formula made with water high in nitrates. The nitrates in the formula reduce the amount of oxygen carried by the blood and could cause "blue baby syndrome" (Methaemoglobinemia). If you have an infant less than six months, it is recommended to use bottled water.

Water testing

Sodium

Well water should be analyzed for the presence of sodium. Individuals who are on a sodium (salt) reduced diet should consult with their physician if the level of sodium in their well water exceeds 20 mg/L. Most domestic water softeners increase the level of sodium in the drinking water. In order to reduce sodium consumption, a separate unsoftened water supply (bypassing the water softener) should be provided for drinking and cooking purposes.

Uranium

Uranium is widespread in nature, occurring in granites and various other mineral deposits. Information on uranium in groundwater and the link with radon gas in homes will be available on the H_2O des Collines website.

Iron

At the concentrations normally found in groundwater iron does not impact on human health. At concentrations above 0.3 mg/L, iron can stain laundry and plumbing fixtures and produce undesirable tastes in beverages. The precipitation of excessive iron imparts an objectionable reddish-brown colour to water. Iron may also promote the growth of certain micro-organisms (e.g. iron bacteria), leading to the deposition of a slimy coating in water distribution pipes.

Manganese

Like iron, manganese does not impact on human health at the concentrations normally found in groundwater. At concentrations above 0.15 mg/L, manganese stains plumbing fixtures and laundry and produces undesirable tastes in beverages. As with iron, the presence of manganese in water may lead to the accumulation of microbial growths in the distribution system. Even at concentrations below 0.05 mg/L, manganese may form coatings on water distribution pipes that may slough off as black precipitates.

Water hardness

Water hardness does not impact on human health. In areas with hard water, household pipes can become clogged with scale; hard waters also cause incrustations on kitchen utensils and increase soap consumption. Hardness levels in excess of 200 mg/L are considered poor but have been tolerated by consumers. Waters with hardness in excess of 500 mg/L are unacceptable for most domestic purposes.

Source: Health Canada's Water Quality Reports and Publications [*http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/#guide*]. Accessed April 2009.

How to interpret bacterial testing results

Total Coliforms ct/100 mL	Fecal Coliforms ct/100 mL	What It Means
0	0	**SAFE for drinking.** Maintain regular testing.
1 to 9	0	**Marginally safe to drink.** The water should be re-sampled to confirm the accuracy and stability of the result. If the second results are still below the Health Canada guidelines, but are of concern to the owner, the well should be disinfected (see page 21).
10 to above 80	0	**Unsafe for drinking.** This water is contaminated and should not be used for drinking under any circumstances.
0	1 to above 80	**Unsafe for drinking.** This water is contaminated and should not be used for drinking under any circumstances.

The chart above was developed using the following Ministère du Développement durable, de l'Environnement et des Parcs (MDDEP) guidelines for well water.

Parameter	MDDEP Guideline
Total Coliforms	10 ct/100 mL
Fecal Coliforms	0 ct/100 mL

If your water is contaminated

How to sterilize your drinking water

If your drinking water results show that your well water is contaminated with bacteria and unsafe to drink, follow these guidelines until your water supply is safe again.

Use only **one** of the following options for a safe supply of drinking water:

- Bring water to a rolling boil and then boil it for at least 2 minutes. (A full rolling boil is a vigorous boil that can not be stopped by stirring the water). **OR**
- Mix 1/4 tsp. (1.25 mL) of liquid household bleach (non-scented), such as Javex, to one gallon (4.5 L) of water and let stand for 30 minutes. There should be a faint chlorine smell to the water. **OR**
- Use commercially bottled water.

Refrigerate boiled or treated water in clean containers.

What water to use for washing and to use for pets

Handwashing: Use bottled, boiled or treated water (as above) or use the usual supply for handwashing, then follow with an alcohol-based hand sanitizer.

Food preparation: Use bottled, boiled or treated water to make juice or formula or to wash ready-to-eat foods such as fruits and vegetables. If the food will be boiled for longer than five minutes during the cooking process, it is not necessary to use treated water. Do not use ice cubes made with the unsafe water.

Bathing/showering: Adults may continue to use the usual supply, as long as no water is swallowed. After you bathe or shower, use treated water to wash your hands. Give sponge baths to children, using treated water.

Brushing teeth: Use boiled, bottled or treated water.

Laundry: Use your usual source of water.

Dishwashing: Use bottled, boiled or treated water.

Pets: Use bottled, boiled or treated water.

Livestock: Consult a veterinarian regarding water for livestock.

Garden: It is recommended that a vegetable garden or a fruit orchard be watered using treated or boiled water.

If your water is contaminated (bacteria)

How to disinfect a well

You can easily disinfect your well contaminated with bacteria by "shock-treating" it with ordinary chlorinated household bleach containing 5.25 per cent sodium hypochlorite. Don't use scented bleach for this purpose. Buy fresh bleach to do this because the chlorine in bleach is unstable and evaporates over time. (Bleach loses half its strength in six months.)

Depth of Well	Volume of bleach added	
	Casing diameter 90 cm (**DUG WELL**)	
	New well	Existing well
1.0 m	3.2 L	0.6 L
3.0 m	9.8 L	2.0 L
5.0 m	16.5 L	3.0 L
10.0 m	32.0 L	6.5 L

Depth of Well	Volume of bleach added	
	Casing diameter 15 cm (**DRILLED WELL**)	
	New well	Existing well
1.0 m	100 mL	20 mL
3.0 m	300 mL	60 mL
5.0 m	500 mL	100 mL
10.0 m	1000 mL	200 mL

Do not drink the water until you receive satisfactory water quality test results.

1. Refer to your well driller's report to find out how deep your well is. The report should be included in the documents you received from the notary during the purchase of your house and is also available from the Ministry of the Environment. Calculate the amount of bleach required based on the chart above.

2. Remove or bypass any carbon filters in the system. (These filters will remove chlorine from the water, thus preventing the pipes beyond the filter from being disinfected.)

If your water is contaminated (bacteria)

3. Pour the required amount of household bleach into the well air vent or by removing the well cover. Wait 2–4 hours for the bleach to mix with the water in your well. Run water through your garden hose onto your driveway until a strong chlorine smell is detected.

4. Use the garden hose to pump the chlorinated water back into the well, flushing down the well casing and water lines above the water level.

5. Run water through all taps until a strong chlorine smell is detected. (If there is no chlorine smell, repeat the chlorine treatment.)

6. Drain the water heater and fill with chlorinated water. Backflush the water softener and all filters except carbon filters. Then wait 12–24 hours.

7. Run the rest of the treated water through an outside hose away from the septic tank system (excess chlorine will kill the bacteria necessary for breaking down wastes) and away from surface water courses i.e. rivers, ditches.

8. Stop running the hose when the smell of chlorine is gone. Run clear water through the faucets. Install new carbon filters after chlorination to avoid introducing bacteria back into the water system.

9. Do not drink the water until test results prove it is safe to drink.

10. Retest 48 hours after chlorination is complete. Two bacteria-clear tests over one to three weeks is a strong indicator that the water is safe to drink.

11. If any test shows contamination, repeat the disinfection process from the beginning.

12. If the water tests are clear, wait one week and retest. Three consecutive safe tests at intervals of one week indicate that the treatment was effective.

If bacterial contamination quickly returns after each time that you 'disinfect' your well, you will need to seek professional help. Options for solving chronic bacterial contamination problems include: installing a drilled well instead of a dug well, creating a better seal around the well head, landscaping so that water does not pool around the well and purchasing an on-site water disinfection system. Please consult the Yellow Pages for local companies that offer these services.

Radon gas

Radon is a radioactive gas that is colourless, odourless and tasteless. It is formed by the natural breakdown of uranium in soil, rock and water.

Radon gas that enters an enclosed space such as a home can sometimes accumulate to high levels. The known health risk associated with exposure to radon is an increased risk of developing lung cancer. It is recommended that remedial measures (seal cracks in basement, install air exchangers, etc.) be taken where the level of radon in a home is found to exceed 200 Bq/m^3.

Testing for radon gas

Consult the Yellow Pages or the H_2O des Collines website (*www.h2o.mrcdescollinesdeloutaouais.qc.ca*) for information regarding uranium in groundwater, radon gas in homes and companies that offer radon gas testing. Be sure to ask the company about their certification standards.

Home water treatment systems

If the safety of your drinking water is in question, it may be necessary to install a water treatment system. Health Canada strongly recommends that drinking water treatment devices purchased by the consumer be certified to NSF International standards (*http://www.nsf.org/Certified/DWTU/*).

Water treatment devices for bacteria

Even if you decide to install one of the systems mentioned below, you should continue to test your water for bacteria at least three times a year and after major plumbing work. You can also test your water before and after your treatment device to determine the efficacy of your system.

Chlorinators:

These mechanical units continuously add chlorine to the water storage tank. The tank allows the chlorine enough contact time to kill bacteria. Chlorinators need to be checked often to make sure the right amount of chlorine is being added.

Ultra-Violet Light (UV) Filters:

Water is passed through an ultra-violet light source to kill harmful bacteria. Water must be very clear for this treatment to work properly (i.e. a filter must be installed before the ultra-violet light system). Drinking water should be refrigerated after treatment. The light must be replaced annually. Research indicates that iron and manganese (often found in high levels in groundwater) can coat the sleeve of the ultra-violet light, rendering the system ineffective. Regular cleaning of the sleeve may be required in order to avoid this problem.

Ozonators:

These mechanical units add small amounts of ozone to the water to kill most bacteria. Drinking water should be refrigerated after treatment.

Water treatment for chemicals (metals, water hardness, etc.)

Reverse Osmosis: (DOES NOT KILL BACTERIA)

Some chemicals are removed by passing the water through a semipermeable membrane. This system is used for removing inorganic chemicals, such as nitrates, and is often used in combination with carbon filters. Water should be filtered before reverse osmosis treatment.

Activated Carbon Filters: (DOES NOT KILL BACTERIA)

Some chemicals are removed by passing the water through an activated carbon bed. These are best for removing tastes, odours and organic chemicals.

Ion Exchange (e.g. Softeners): (DOES NOT KILL BACTERIA)

Minerals and chemicals in the water are removed by exchanging them with Sodium ions that are loosely held to resin beads. Salt (NaCl) is used to backflush the system to recharge the resin beads with Sodium ions periodically. The most typical ion exchange systems are water softeners, used to treat hard water (removal of calcium and magnesium).

Distillers:

Water is boiled in one compartment, then condensed and collected in another compartment. Water should be filtered before treatment and refrigerated afterwards. Some organic and inorganic chemicals are also removed.

Please check the Yellow Pages to access local companies who specialize in home water treatment.

Septic systems and your well

How septic systems can contaminate wells

What is the connection between septic systems and drinking water? Septic systems have the potential to contaminate your well – or your neighbour's.

Poorly maintained or damaged septic systems can contaminate ground water with *E.coli* bacteria or nitrate. *E.coli* is a family of bacteria that, depending upon the concentration and strain present in drinking water, can cause vomiting, diarrhea and even death.

Nitrate is a phosphate substitute used in cleaning products and laundry soaps, and is also in fertilizers, animal excrement and human sewage. Nitrate is a fast moving nutrient with no taste, odour or colour. Nitrate can depress infant respiration, can destroy the sewage-digesting bacteria in septic systems and is suspected of causing cancer.

How septic systems work

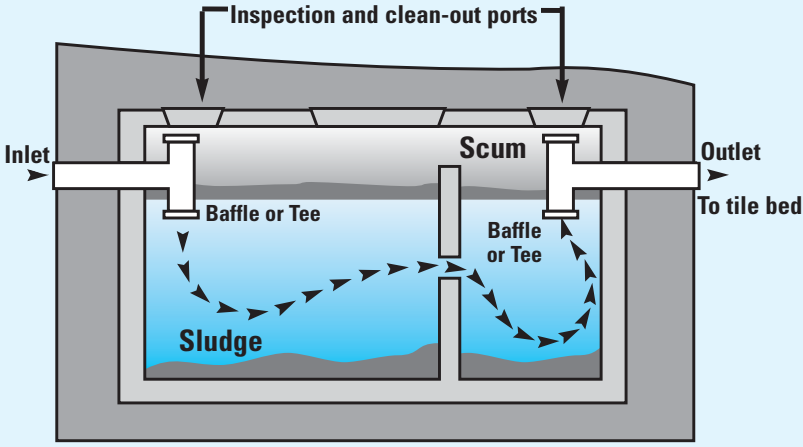
Your septic system is a private sewage treatment plant that must process all the wastewater from your house. Wastewater is piped from the house to the first stage of the system: usually a double-chambered concrete or plastic tank, which has baffles to prevent raw waste from flowing into the second stage: a system of water-permeable pipes called the tile bed. Aeration may also be added between the first and second stages.

Bacteria in the system break down sewage and wastewater. Undigested solids settle in the bottom of the tank as sludge. Lighter solids float to the top as scum. Liquid containing dissolved materials is taken from between these two layers and flows continuously and evenly into the tile bed. A final biological treatment process occurs as the wastewater works its way from the tiles through the bed itself, prior to being discharged into the water table. At every stage, aerobic (oxygen using) or anaerobic (oxygen independent) bacteria are at work, digesting the material. However, end products of the system still do contain nutrients, bacteria and chemicals.

For more information, contact the Environmental services department of your municipality (see p. 4 for contact info).

Septic system problems

How septic systems work



When septic systems don't work

If the tank is not pumped out regularly, the sludge and/or scum layers will be drawn into the wastewater distributed to the tile bed, eventually overloading the system. After sufficient overload time, the tile bed will no longer be capable of distributing the wastewater into the ground, causing "breakouts".

These breakouts are direct discharges of partially treated wastewater onto the ground surface. Sewage and its associated wastes will filter into the soil, contaminating everything it reaches – your well, your neighbour's well, the underground water supply, and local streams and rivers.

If too much water is dumped in the tank, the tile bed will be overloaded with the same result, as well as the possibility of it backing up into your house.

If excess household chemicals, soaps and detergents are washed into the septic tank, the bacterial action may be slowed or killed.

Septic systems

What about septic systems in clay?

Ground consisting of dense clay generally has a lower capacity to absorb the daily average wastewater flow coming from a residence. Even if the septic system was designed according to the provincial standards, it has a shorter 'life expectancy' when built on clay soil. The early signs of percolation problems, such as leakage or backflow from the tile bed to the septic tank, are sometimes observed less than six years after the construction of the septic system. If your property is located in a clay soil area, you can prevent premature 'ageing' of your septic system by following the tips proposed in this booklet and by reacting quickly when a problem of saturation is observed.

Empty your septic system!

In the province of Quebec, septic tanks are required to be emptied every two years for full time residences and every four years for seasonal residences. Contact your Municipality to learn about any additional requirements.

Consult the Yellow Pages to access local companies who are authorized to do this work.

Municipal septic tank emptying programs

The Municipality of Chelsea implemented a Septic Tank Emptying Program in 1991 that ensures that each septic tank in Chelsea is properly emptied every three years. This innovative program helps reduce septic contamination, thereby protecting surface and groundwater resources. A similar program has since been implemented in the municipalities of L'Ange Gardien and Cantley.

Managing your septic system

Signs of trouble

- Grass over the tile bed is unusually green or spongy to walk on.
- Plumbing takes longer to drain.
- You can smell sewage.
- Grey or black liquids surface in yards.
- A test of your or a neighbour's well water shows contamination.

Septic system care – DO THIS!

DO know where the tank is located and keep a maintenance record.

DO know when the next emptying of your septic tank should take place (i.e. minimum every two years for full time residences and every four years for seasonal residences).

DO plant grass over the leaching field; it will help prevent erosion and absorb excess water.

DO divert surface runoff water from roofs, patios, driveways, and other areas away from the leaching field.

DO conserve water to avoid overloading the system.

Managing your septic system

Septic system care – DON'T!

DON'T use your toilet as a trash can.

DON'T use more soap or detergents than you need to.

DON'T install a kitchen garbage disposal system (garberator)

DON'T poison your septic system and the groundwater by pouring harmful chemicals and cleaners such as chlorine bleach, toilet bowl cleaners, borax and drain openers down the drain.

DON'T drive over or park cars, trucks or heavy equipment on the tile bed.

DON'T plant trees or shrubbery in or near the tile bed, because the roots will grow into the lines and plug them.

DON'T pave the tile bed with concrete or asphalt.

DON'T drain your water softener backwashes into the septic tank. Use a class-2 leaching pit (dry well) or the sump hole in your basement.

DON'T add "starters" or "conditioners"; some will interfere with normal operations; others (particularly degreasers) contain cancer-causing substances that could contaminate the groundwater.

Septic system care – NEVER!

NEVER flush these items into the tank (they cannot be broken down by bacteria or will destroy the bacterial action):

- loose hair
- coffee grounds
- dental floss
- disposable diapers
- kitty litter
- disposable cleaning cloths
- cigarette butts
- fat, grease, or oil
- paper towels
- sanitary napkins, tampons or condoms
- gauze bandages

NEVER flush chemicals into the tank (they could contaminate surface and groundwater):

- paints
- varnishes and thinners
- waste oils and fuel
- photographic solutions
- pesticides or herbicides
- cleaners and chemical products
- pharmaceutical products

The chemical products listed above should be safely contained and kept for Hazardous Waste disposal (do not throw out with regular garbage). Contact your municipality for details on how to properly dispose of hazardous wastes (see p. 4).

Remember! If you flush harmful chemicals into your septic system many of the products will ultimately make their way into our groundwater. Please take the time to deal with these products properly!

Municipal permits

New well or septic system? Get a municipal permit!

New wells and septic systems must be designed carefully to protect our water resources. In Québec, wells must be drilled by a water well contractor licensed by the Régie du bâtiment du Québec (R.B.Q.) and be tested by a Ministry of Environment accredited laboratory before the thirtieth day following the beginning of use of the pumping equipment.

Septic systems must be designed by an expert in sanitary engineering according to provincial law and their installation monitored by a technician or an engineer hired by the homeowner.

For more information regarding wells, septic systems and permits please contact:

- Your municipality (see p. 4)
- Direction régionale du Ministère de l'Environnement
  (819) 772-3434
- Direction de santé publique de l'Outaouais
  (819) 777-3871

Keep well and septic system documents safe, as you will need them when you sell your house. Be sure to ask for copies of these records when you are the buyer.

Blue-green algae

Blue-green algae and your health

Blue-green algae (cyanobacteria) form in shallow, warm, slow-moving or still water. Under some conditions, blue-green algae proliferate rapidly and form what is called an algae bloom. Algae blooms look like a paint spill, or broccoli soup. They are often green or blue-green in colour, sometimes edging towards red. Near shorelines, blooms rise and amalgamate into surface scum and may emit an unpleasant odour. In addition to looking repulsive, algae blooms have the ability to produce toxins which can be hazardous to humans and animals.

If you ingest water, fish or blue-green algal products containing elevated levels of toxins, you may experience headaches, fever, diarrhea, abdominal pain, nausea and vomiting. If you swim in contaminated water, you may get itchy and irritated eyes and skin, as well as other hay fever-like allergic reactions. If you suspect you might have come into contact with cyanobacterial toxins and are experiencing any of these symptoms, rinse any scum off your body and consult your physician immediately.

For detailed information regarding recognizing blue-green algae and how to protect your health, visit: the Ministère du Développement durable, de l'Environnement et des Parcs's (MDDEP) website at: *www.mddep.gouv.qc.ca.*

To report an algae bloom, contact your Regional MDDEP office at: (819) 772-3434.

Blue-green algae

Protect our lakes and streams!

The main factor that determines a lake or stream's susceptibility to blue-green algae blooms is its level of phosphorus. Phosphorus has a naturally occurring low presence in surface waters, however many human activities can lead to higher levels. Excess phosphorus is found in domestic wastewater and drainage and runoff from deforested land or cultivated fields and shorelines that have been enriched with fertilizers, compost and solid or liquid manure. Preventing phosphorus overload in surface water and upstream watersheds remains the best way of countering blue-green algae proliferation.

Positive steps include:

- Restore shoreline vegetation or avoid clearing it away, because shoreline vegetation retains soil that is potentially rich in phosphorus and uses this fertilizing element for growth.
- Limit the use of chemical fertilisers, compost and manure on lawns.
- Use phosphate-free soaps and cleaning products.
- Ensure proper functioning and regulatory compliance of septic tanks.

For detailed information regarding blue-green algae and what homeowners can do to protect our lakes and streams please visit the MDDEP website at *www.mddep.qc.ca*.

The Conférence régionale des élus de l'Outaouais (CRÉO) worked with regional experts to develop a comprehensive resource booklet regarding blue-green algae and best practices for protecting lakes and streams. The booklet is available in a printable PDF format at: *www.cre-o.qc.ca* and on the H_2O des Collines website.

Sources: Blue-Green Algae (Cyanobacteria) and their Toxins (accessed from Health Canada's Water Quality website, April 2009).

Blue-green algae and our surface water (accessed from the Ministère de Développement durable, de l'Environnement et des Parcs Rivers Water website, April 2009).

Log book

Log book of septic system and well maintenance/repairs

Date	Maintenance/Repair
Example 2009-01-01	Disinfected the well using regular household bleach

Log book

Log book of well water analysis

Date	Well water analysis
Example 2009-01-01	Bacterial analysis (fecal and total coliforms) and metals package. All results met the health guidelines.