



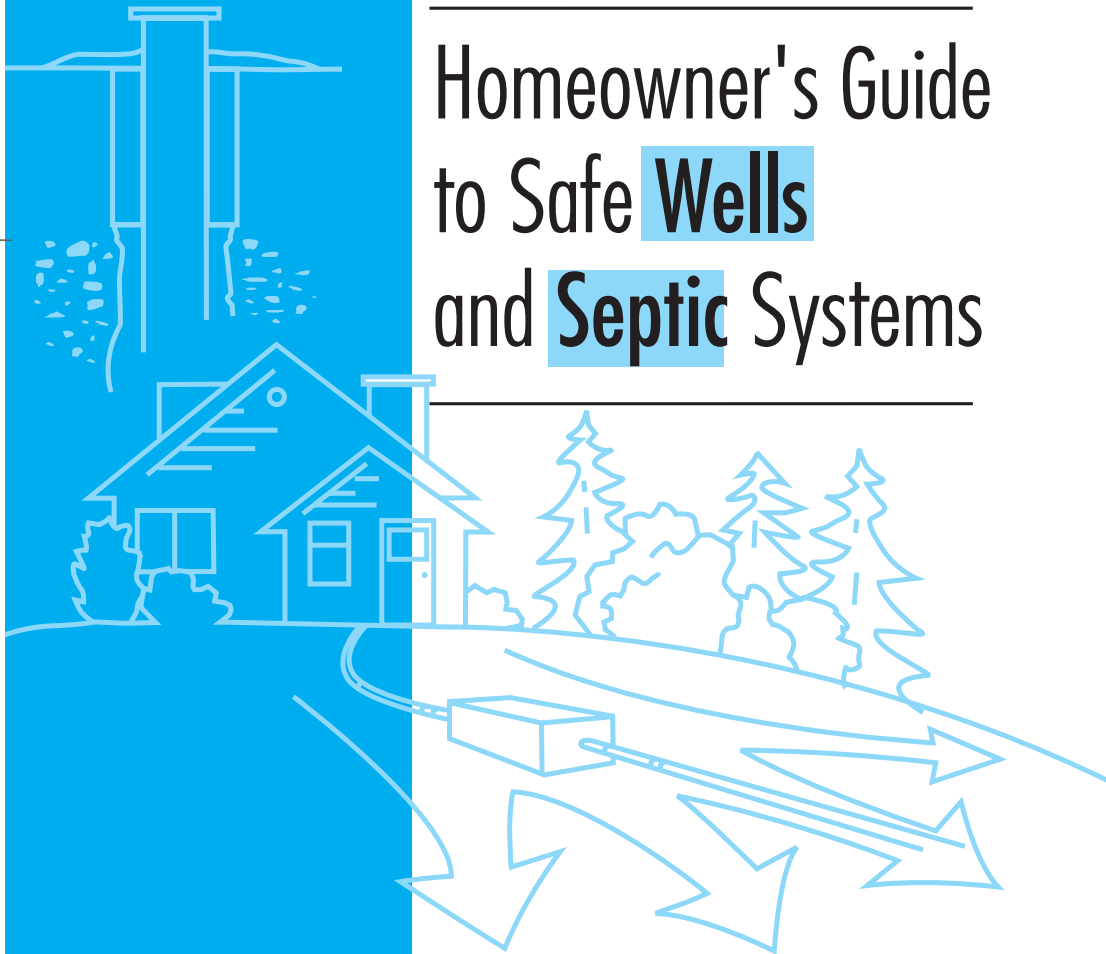
Eastern Ontario Water Resources Committee  
Comité des ressources en eau de l'Est de l'Ontario

[www.nation.on.ca/eowrc/](http://www.nation.on.ca/eowrc/)



# How Well is Your Well

## Homeowner's Guide to Safe **Wells** and **Septic** Systems



For residents of the City  
of Ottawa, United Counties  
of Stormont Dundas &  
Glengarry, Prescott-Russell  
and Leeds and Grenville



Prescott  
Russell





## Acknowledgements

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Canadian Institute of Public Health Inspectors  
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Aussi disponible en français : *Guide du propriétaire pour des puits et des fosses septiques sécuritaires*

Comité des ressources en eau de l'Est de l'Ontario (CREEO) a/s Conservation de la Nation Sud (CNS) au 1-877-984-2948 (sans frais) ou l'Office de protection de la nature de la région de Raisin au (613) 938-3611.

July 2002

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**Homeowner's Guide to Safe Wells and Septic Systems**

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## EOWRC background and partners

An Eastern Ontario Water Resources Management Study (EOWRMS) was completed March 2001. This study encompassed an extensive compilation and evaluation of regional water resources and servicing infrastructure information. The EOWRMS was initiated because of the need to develop a regional water resources information system on a watershed basis. The study looked at several new initiatives to protect water in Eastern Ontario. Through the numerous studies undertaken with the management study, a public education and awareness plan was found to be one of the principal action plans of the Regional Water Resources Management Strategy for Eastern Ontario. As a recommendation from the EOWRMS Steering Committees, the Eastern Ontario Water Resources Committee (EOWRC) was established in 2001. The EOWRC is responsible for implementing the recommendations of the EOWRMS.

### 2002 EOWRC Membership

The EOWRC is a multi-disciplinary committee made up of representatives from the following organizations:

#### **Municipalities:**

City of Ottawa  
 United Counties of Leeds  
 and Grenville  
 United Counties of Prescott  
 and Russell  
 United Counties Stormont, Dundas  
 & Glengarry

#### **Provincial Government:**

Ministry of the Environment  
 and Energy  
 Ontario Ministry of Agriculture  
 and Food

#### **Federal Government:**

Agriculture and Agri-food Canada

#### **Agriculture:**

Christian Farmers Federation  
 Dairy Farmers of Ontario  
 L'Union des cultivateurs  
 franco-ontariens  
 Ontario Cattlemen's Association  
 Ontario Federation of Agriculture  
 Ontario Soil and Crop Improvement  
 Association  
 Pork Producers

#### **Conservation Authorities:**

Raisin Region Conservation Authority  
 South Nation Conservation

#### **Others:**

Eastern Ontario Health Unit  
 Resource Stewardship Councils  
 University of Ottawa

## Where to find help



Agency	Services
<b>City of Ottawa Public Health</b> Tel.: 580-2400	<ul style="list-style-type: none"> <li>■ Advice, information, sample bottles</li> </ul>
<b>Eastern Ontario Health Unit</b> <b>Cornwall</b> head office – Tel.: (613) 933-7930 or (613) 933-1375 or 1-800-267-7120 <b>Casselman</b> satellite office – Tel.: 1-800-267-8260 or (613) 764-2841 <b>Alexandria</b> office – Tel.: (613) 525-1112 <b>Hawkesbury</b> office – Tel.: (613) 632-4355 or 1-800-565-2314 <b>Rockland</b> office – Tel.: (613) 446-1400 <b>Winchester</b> office – Tel.: (613) 774-2739	<ul style="list-style-type: none"> <li>■ Well water sampling information</li> <li>■ Water sample bottles</li> <li>■ Free bacteriological analysis of drinking water offered to private citizens who draw their drinking water from a well</li> <li>■ Water test results interpretation</li> <li>■ Listing of licensed well technicians and contractors</li> <li>■ Conduct septic system inspection</li> <li>■ Provide sewage system permits</li> </ul>
<b>Leeds, Grenville &amp; Lanark District Health Unit</b> <b>Brockville</b> regional office – Tel.: (613) 345-5685 email: info@healthunit.org	Same as above <ul style="list-style-type: none"> <li>■ Listing of licensed sewage installers</li> </ul>
<b>Local water well drilling companies</b> Consult the yellow pages	<ul style="list-style-type: none"> <li>■ Servicing, consultation</li> </ul>
<b>Ontario Ministry of Agriculture and Food (OMAF)</b> <b>Kemptville</b> office – Tel.: (613) 258-8306 <b>Alfred</b> office – Tel.: (613) 679-4411 Tel. Toll Free: 1-888-466-2372	Publications such as: <ul style="list-style-type: none"> <li>■ <i>Best Management Practices: Water Wells</i></li> <li>■ <i>Best Management Practices: Water Management</i></li> </ul>
<b>Ontario Ministry of the Environment</b> Tel.: 1-800-268-1154	<ul style="list-style-type: none"> <li>■ Well records, information</li> <li>■ Regulation 903 (concerning wells), and a well educational video entitled Well Aware: A Well Owner's Guide that provides important information on: well location, construction, maintenance, testing and plugging</li> </ul>
<b>Ontario Ministry of Health Laboratory</b> 2380 St. Laurent Blvd. Tel.: 763-6800	<ul style="list-style-type: none"> <li>■ Well water testing</li> </ul>
<b>Ontario Rural Wastewater Centre</b> Tel. (613) 679-2218 ext. 609 email: ckinsley@alfredc.uoguelph.ca	Provides training, demonstration and applied research in the areas of: <ul style="list-style-type: none"> <li>■ on-site disposal of household septage</li> <li>■ nutrient and agri-food waste management</li> <li>■ rural municipal wastewater treatment</li> </ul>



## Where to find help

Agency	Services
<p><b>Ottawa Septic System Office</b>            Managed by the <b>Rideau Valley Conservation Authority (RVCA)</b> Tel.: 692-0160</p>	<ul style="list-style-type: none"> <li>■ Septic system inspection</li> </ul>
<p><b>Raisin Region Conservation Authority (RRCA)</b>            Tel.: (613) 938-3611 email: info@rrca.on.ca</p>	<ul style="list-style-type: none"> <li>■ Municipal groundwater study</li> <li>■ <i>Homeowner's Environmental Handbook</i></li> <li>■ Environmental forums</li> <li>■ Surface water quality sampling</li> <li>■ Monitoring groundwater quality and quantity</li> <li>■ Stream gauge monitoring for water quantity levels</li> <li>■ Water Efficiency Team to assist landowners in reducing water consumption</li> <li>■ Landowner incentive grants for best management practices</li> </ul>
<p><b>Rideau Valley Conservation Authority (RVCA)</b>            Tel. Toll Free: 1-800-267-3504 or (613) 692-3571            email: info@rideauvalley.on.ca</p> <p><b>LandOwner Resource Centre</b>            Tel. Toll Free: 1-800-387-5304</p>	<ul style="list-style-type: none"> <li>■ Homeowner workshops wells &amp; septic systems</li> <li>■ Water quality testing</li> <li>■ Landowner incentive programs</li> <li>■ Landowner information services</li> <li>■ Septic system approvals and inspections</li> </ul>
<p><b>South Nation Conservation (SNC)</b>            Tel. Toll Free: 1-877-984-2948 or (613) 984-2948            email: info@nation.on.ca</p>	<ul style="list-style-type: none"> <li>■ General well and septic system presentations for community groups</li> <li>■ Informative videos on wells</li> <li>■ Well and septic information kits</li> <li>■ Clean Water Program grants</li> <li>■ F.C.A.W. permits</li> <li>■ River water quality monitoring</li> <li>■ Groundwater monitoring</li> <li>■ Environmental forums</li> <li>■ <i>The Healthy Home Guidebook – Protecting Your Home Family and Environment</i> (in conjunction with the Dundas Environmental Awareness Group [DEAG])</li> </ul>

## Where to find help



### Information on the Web

[http://www.city.ottawa.on.ca/city\\_services/yourhealth/28\\_0\\_en.shtml](http://www.city.ottawa.on.ca/city_services/yourhealth/28_0_en.shtml)  
(City of Ottawa Public Health Information)

[http://www.city.ottawa.on.ca/city\\_services/waterwaste/27\\_2\\_6\\_2\\_en.shtml](http://www.city.ottawa.on.ca/city_services/waterwaste/27_2_6_2_en.shtml)  
(City of Ottawa Rural Clean Water Program)

[http://www.city.ottawa.on.ca/city\\_services/waterwaste/27\\_0\\_en.shtml](http://www.city.ottawa.on.ca/city_services/waterwaste/27_0_en.shtml)  
(City of Ottawa Water Quality Information)

<http://www.ec.gc.ca/water/> (Environment Canada)

<http://www.hc-sc.gc.ca> (Health Canada Online)

<http://www.ofa.on.ca/water/> (Ontario Federation of Agriculture – go to Best Management Practices: Water Wells)

<http://www.ene.gov.on.ca/water.htm> (Ontario Ministry of Environment and Energy – many links to water-related information)

<http://www.oowa.org> (Ontario On-site Wastewater Association)

<http://www.orwc.uoguelph.ca> (Ontario Rural Wastewater Centre)

<http://www.ontariostewardship.org> (Ontario Stewardship Councils)

<http://obc.mah.gov.on.ca/septic.htm/index.htm>  
(Operating and Maintaining Your Septic System)

<http://www.hc-sc.gc.ca> (Health Canada – use drinking water wells as key words)

<http://www.rideauvalley.on.ca/septic1.html> (Rideau Valley Conservation Authority – where to go for local septic system information)

<http://www.nation.on.ca> (South Nation Conservation)

### Where to find help in Eastern Ontario

<http://www.eohu.on.ca> (Eastern Ontario Health Unit)

<http://www.nation/eowrc.on.ca> (Eastern Ontario Water Resources Committee)

<http://www.foca.on.ca> (Federation of Ontario Cottager's Associations)

<http://www.healthunit.org> (Leeds, Grenville & Lanark District Health Unit)

<http://www.mvc.on.ca> (Mississippi Valley Conservation)

<http://www.gov.on.ca/OMAF/index.html> (Ontario Ministry of Agriculture and Food (OMAF))

<http://www.ontariosoilcrop.org> (Ontario Soil and Crop Improvement Association)

<http://www.rrca.on.ca> (Raisin Region Conservation Authority)

<http://www.rideauvalley.on.ca> (Rideau Valley Conservation Authority)



## Homeowner resources

There are resources to assist the homeowner and people who can help.

Agency	Funding Assistance
<p><b>Ontario Federation of Agriculture (OFA)</b>            Head Office:            40 Eglinton Ave. E, Fifth Floor, Toronto, ON M4P 3A2            Tel. Toll Free: 1-800-668-3276; Tel. (416) 485-3333;            Fax (416) 485-9027            email: info@ofa.on.ca</p> <p><b>Dundas/Frontenac/Grenville/Leeds Rep.</b>            Ms. Joanne High            Tel.: (613) 535-1555</p> <p><b>Lanark/Renfrew/Arnprior/Ottawa Rep.</b>            Mr. Graham Lightfoot            Tel.: (613) 646-2613</p> <p><b>Prescott/Russell/Stormont/Glengarry Rep.</b>            Mr. Roch Lalonde            Tel.: (613) 443-1778</p>	<p><b>Rural Well Upgrading and Decommissioning Project</b> – Grants are offered to qualified applicants in Ontario starting October 1st 2001 until March 31, 2003 to Homeowners to assist with the cost of existing water well upgrading and decommissioning projects. Application forms for the water well projects are available now from all OFA Member Services Representatives that are listed in the left column or from the OFA head office.</p>
<p><b>South Nation Conservation</b>            15 Union Street, Berwick, ON K0C 1G0            Tel. Toll Free: 1-877-984-2948            Tel.: (613) 984-2948            email: info@nation.on.ca</p>	<p><b>Clean Water Program</b> – Offers grants to urban and rural residents, agricultural landowners, community groups, and businesses located in the South Nation watershed. Kinds of projects eligible are: manure storage, septic system repair, private wellhead protection, plugging unused wells, etc.</p>
<p><b>Raisin Region Conservation Authority</b>            Box 429, 6985 Boundary Rd., Cornwall, ON K6H 5T2            Tel.: (613) 938-3611 email: info@rrca.on.ca</p>	<p><b>Raisin Region Healthy Waterways Program/Tributaries Restoration Program</b> – Offers funding assistance to rural landowners to upgrade wells, septic systems, manure storage facilities and other projects that improve water quality in adjacent waterways.</p>
<p><b>City of Ottawa</b> through the LandOwner Resource Centre in Manotick            Tel. Toll Free: 1-800-387-5304            Tel.: (613) 692-2390            internet: www.ottawa.ca</p>	<p><b>Rural Clean Water Program</b> – Offers grants and technical assistance for rural projects such as buffer strips, cropping practices, erosion protection, manure storages and septic system repairs.</p>
<p>Managed by the OFA for the <b>Ontario Farm Environmental Coalition</b>            Tel. Toll Free: 1-800-668-3276            internet: www.ofa.on.ca/water</p>	<p><b>Rural Water Quality Testing Program</b> – An alternative testing program that offers different packages such as: Metals and Minerals, Bacteria, Oils and Diesel, Pesticides, and Gasoline and Solvents. Costs vary per package but include a well record for registered wells and a booklet on Water Wells Best Management Practices.</p>

Contact your local Conservation Authority for funding assistance relating to well protection, well decommissioning and septic systems.



## All about water

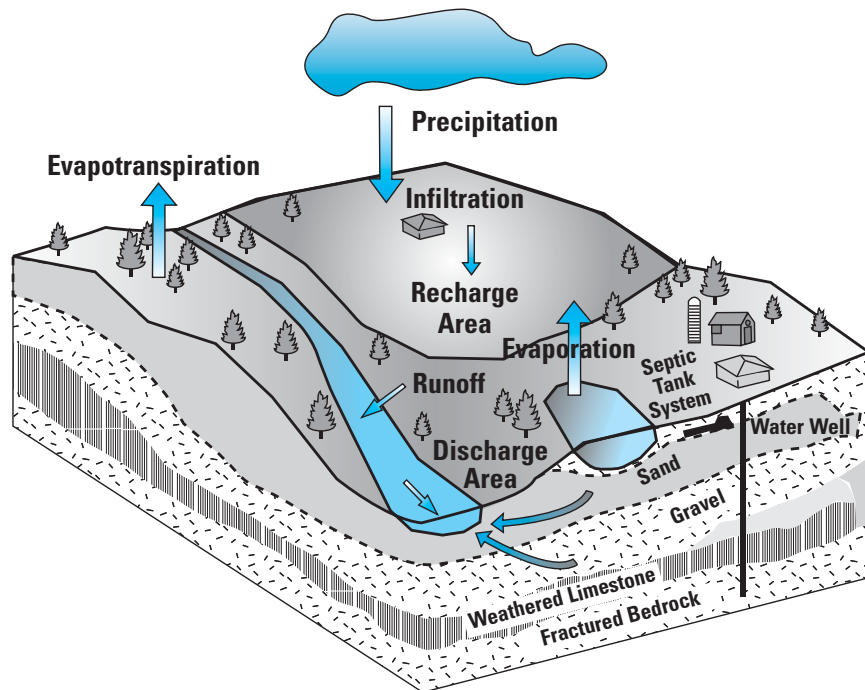


### Where water comes from

**The water we drink** generally comes from surface water (above ground) or groundwater (underground). Only about 1% of the Earth's water is surface and groundwater.

**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

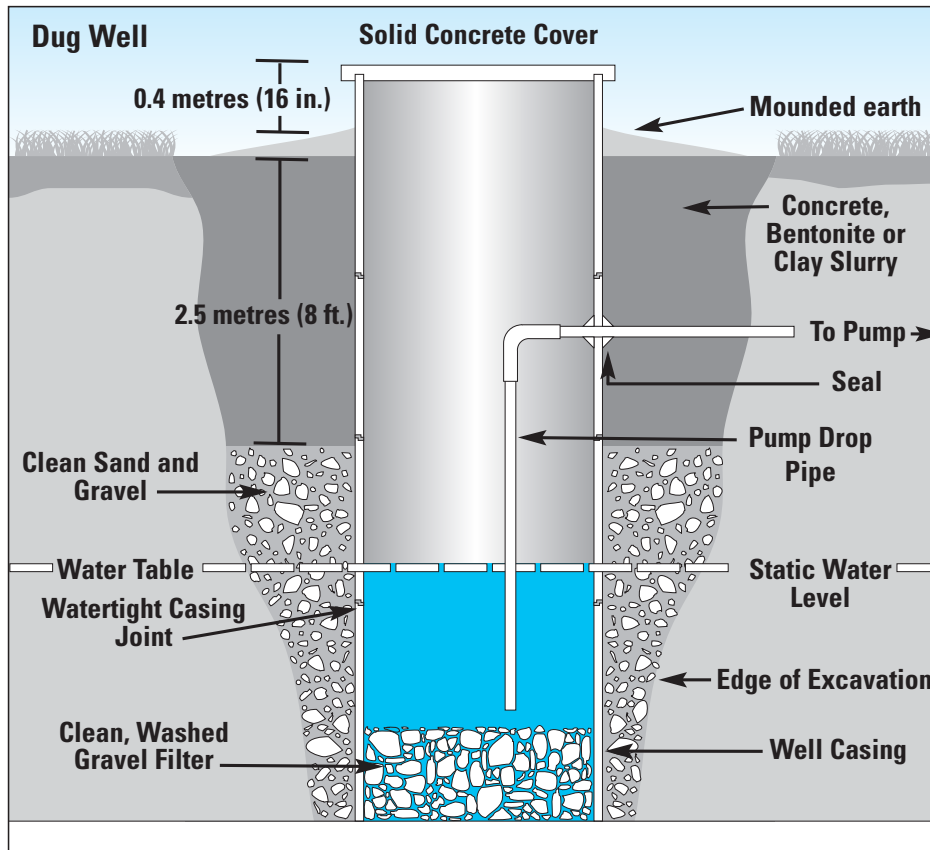
## Sources of water



### Wells

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.

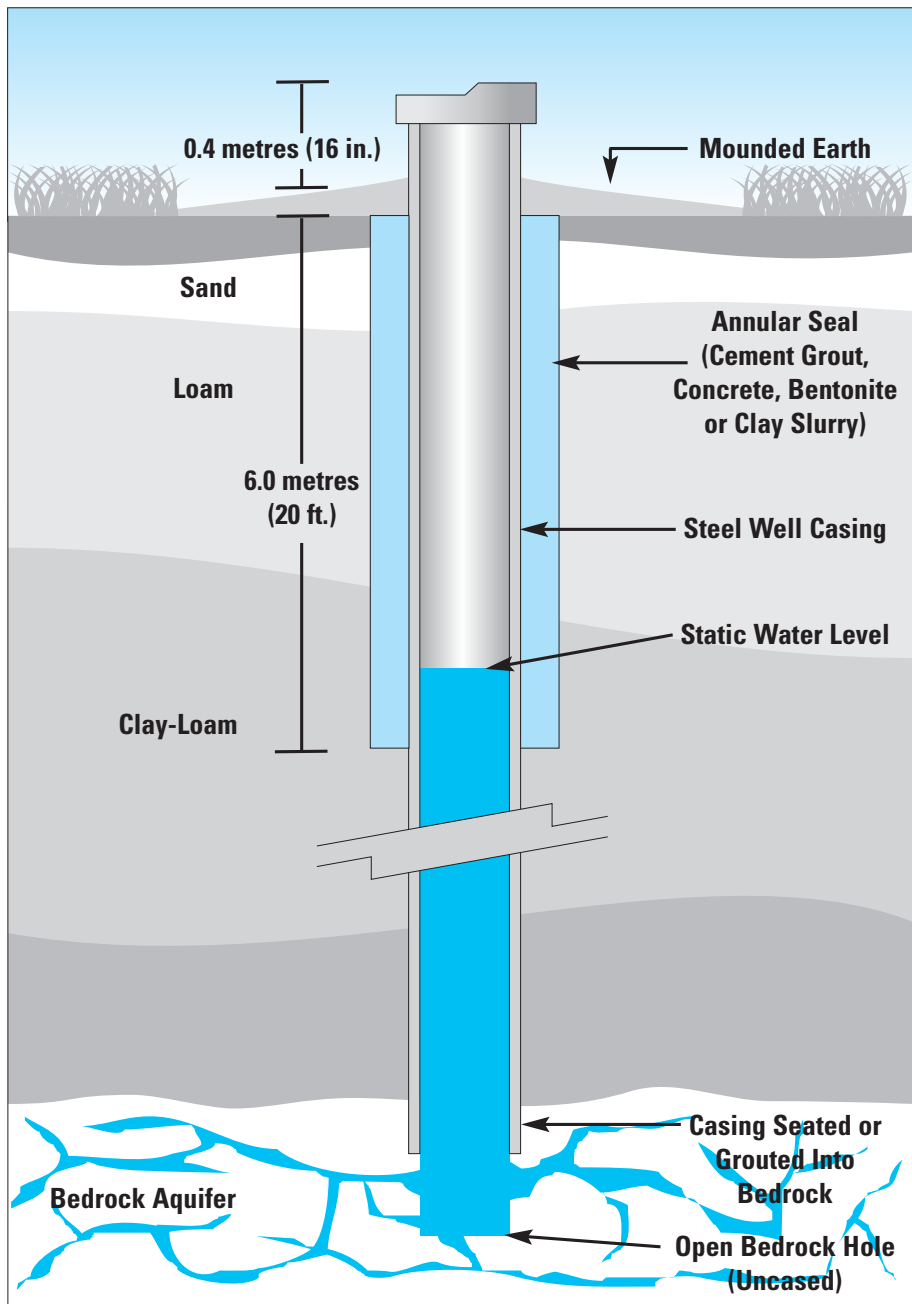
**Common types of wells:** Dug and bored wells (with casings 60 to 120 cm/24 to 48 in.) are less expensive to install than drilled wells. Like sand point wells, dug/bored wells are prone to near-surface contamination and shortages. Drilled wells (casings 10 to 20 cm/4 to 8 in.) cost more but penetrate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

## Sources of water



### Bottled water

While bottled water available in Canada is generally of good quality, it is not necessarily safer or healthier than water from municipal supplies.

The sale of bottled water is not licensed in Canada. However, the federal Health Protection Branch makes spot checks from time to time of both domestic and foreign bottled water. In addition, local health units do regular bacterial testing on all bottled water distribution located in their district.

Municipal water supplies are checked for 350 or more substances. Only three substances must be checked in bottled water. These are bacteria content, fluoride and total dissolved solids (magnesium, iron, sodium).

Bottled water may contain naturally occurring bacteria, which under improper and/or prolonged storage conditions, could increase in numbers to levels that may be harmful to health. Refrigeration is a good way to reduce the growth of these bacteria.

Storage of bottled water may provide an opportunity for bacteria to grow, particularly if the containers were not sterile.

### 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 a cistern supply is not recommended for human bathing or drinking water. Cistern water should only be used for such uses as lawn and garden watering and washing cars.



## 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-Efficient 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 when you clean 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 conservation



### Water-Efficient Habits – Outdoors

- Don't wash your car in the driveway; go to a car wash, where soapy water is cleaned and recycled instead of draining into the storm sewers to contaminate our rivers. Alternately, you can wash your car with a sponge and bucket on the lawn.
- 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.

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 (see page 14)	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 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; green-sand 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)	Filters; alum treatment



## 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. If you are in an agricultural area, you may also wish to test for pesticides, herbicides, gasoline and/or solvents.

*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.*

### How to sample your well water for bacteria

Contact your local Health Unit office (see page 3 for listing) to find out where to get the appropriate sterile sample bottles and where to deliver the sample(s). Coliform and *E.coli* bacteria tests are done free of charge by your local Health Unit. For other substances such as minerals, chemicals and other types of microbes please contact a private laboratory.

Explicit instructions come with the sample bottle. Follow the instructions closely, as careless sampling can interfere with the accuracy of results. Find out exactly when the samples are picked up by the laboratory for analysis as "freshly taken" samples delivered in a cooler will give a more accurate reading than ones that have sat for a long time, especially if no refrigeration is provided at the pick-up site.

1. Obtain a water sample bottle.
- 2. Do not touch the bottle lip and do not rinse out the bottle.**
3. Remove aerators and other attachments from your tap.
4. Let the cold water run for 2 to 3 minutes before sampling.
5. Fill the bottle to "fill line" directly from the tap without changing the flow of water. Replace cap tightly.
6. Complete and attach the form that came with the bottle. Return the sample and form to the health unit or laboratory within 24 hours of collection.
7. Samples must be refrigerated after collection. During transportation, put the bottle in a cooler if possible.
8. Keep a record of your yearly water test results for future reference. They will show any change in your water quality, and also could be used to prove that an outside activity such as a spill or leak affected your water supply.

## What the test results mean



### Water quality test results

You will receive the results by mail in approximately seven days. Results are also available at the laboratory four days after submission.

**If you need help** interpreting the results, please contact your nearest Health Unit office (see page 3), or the provincial laboratory at (613) 736-6800.

### Bacterial test results

See the next page 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.

#### *Escherichia coli (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.

#### 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.



## How to interpret bacterial testing results

This scale does not apply to testing of surface water used for swimming.

Total Coliforms	<i>E.coli</i>	What It Means
1 to above 80	1 to above 80	<b>Unsafe for drinking.</b> This water is contaminated and should not be used for drinking under any circumstances.
6 to 80	0	<b>Unsafe for drinking.</b> Contamination is not likely to be of sewage origin unless it is far removed from the water source or unless there has been a delay in receipt of the sample. Common in new wells before disinfection and shallow dug wells that are not properly sealed.
1 to 5	0	<b>Safety is doubtful</b> on the basis of a single test. Safe for drinking <b>only if</b> testing of three samples collected one to three weeks apart shows no higher and the condition is judged stable, <b>and</b> the well is protected and located at least 30 m (100 ft.) away from any source of human or animal waste.
0	0	SAFE for drinking. Maintain regular testing.
0/G		<b>Safety is doubtful.</b> Not recommended for drinking. No coliform bacteria could be detected because the sample was overgrown with other bacteria. This condition frequently occurs with new wells, dug wells receiving soil drainage, or wells that have been idle for some time. Disinfect the well and collect another sample, clearly identified as " <i>repeat sample</i> ".

## If your water is contaminated



### How to sterilize your drinking water

If your drinking water results show that your well water is contaminated 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 one full minute. (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, such as Javex, to one gallon (4.5L) 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

### 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.)

**Dug Wells** (three feet (1 m) in diameter): Add one quart (one litre) of household bleach for every five feet (1.5 m) of water depth.

**Drilled Wells** (six inches (15 cm) in diameter): Add five ounces (142 mL) of household bleach for every 25 ft (7.5 m) of water depth.

**Well Points** (two inches (5 cm) in diameter): Add three ounces (85 mL) of household bleach for every 10 ft (3 m) of water depth.

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

1. Refer to your well record to find out how deep your well is. If you don’t know how deep the water is in the well, use the well depth to estimate how much bleach to add.
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.)
3. Pour the required amount of household bleach into the well air vent or by removing the well cover.
4. If possible, agitate or mix the well water by using a clean hose to pump the chlorinated water back into the well, flushing down the well casing and water lines above the water level.
5. Disconnect the pump filter, run water through all taps for 20 minutes until a strong chlorine smell is detected. (If there is no chlorine smell, repeat the chlorine treatment.)

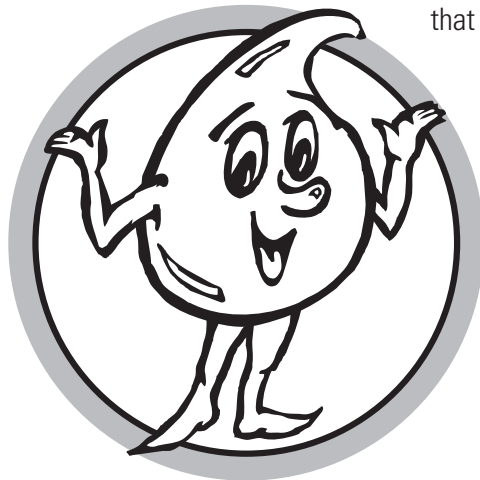
## If your water is contaminated



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

If shock chlorination doesn't correct the problem, you will need professional help to determine whether a new well (such as a drilled well instead of a dug well) is required, or whether an on-site water disinfection system will deliver the desired results.

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.





## Home water treatment systems

### Water treatment devices for bacteria

If the safety of your drinking water is in question, it may be necessary to install a water disinfection system. Even if you have installed such a system, you must continue to test your water for bacteria at least three times a year and after major plumbing work.

#### **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. Water may need to be filtered before ultra-violet light treatment. Drinking water should be refrigerated after treatment. The light must be replaced regularly.

#### **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.

#### **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

#### **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.



## 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 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.

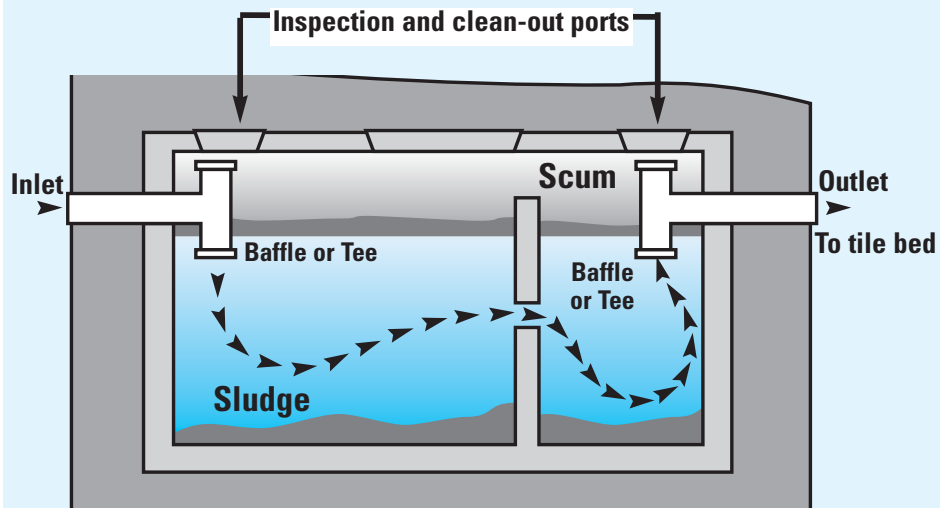
Bacteria in the system break down sewage and wastewater. Undigested solids settle in the bottom of the tank as sludge. Lighter solids float to the top as scum. Liquid containing dissolved materials is taken from between these two layers and flows continuously and evenly into the tile bed. A final biological 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.

**More information contact:** • the Eastern Ontario Health Unit for Prescott Russell, Stormont, Dundas & Glengarry • the Leeds, Grenville & Lanark District Health Unit for the Leeds, Grenville and Lanark area (see page 3 for listings), and • the Rideau Valley Conservation Authority (Tel.: (613) 692-3571) for the Ottawa area.



## 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 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.

## Managing your septic system

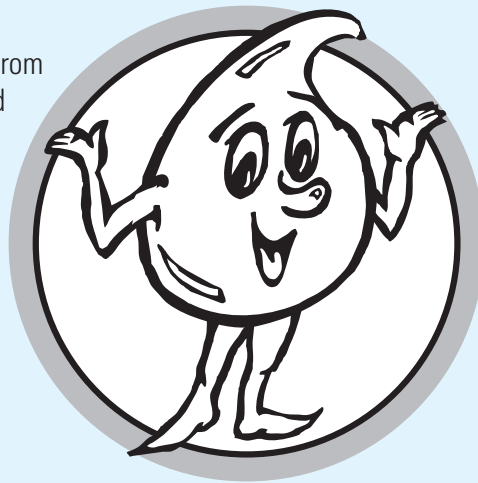


### Signs of trouble

- 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** make sure you hire a licensed septic tank servicing company for regular inspections and that they take care not to damage inlet or outlet baffles or tees during pumping.
- DO** get the tank pumped to remove the accumulated scum and sludge. Pumping intervals should be based on regular inspections (including measurement of scum and sludge levels in your tank).
- 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 garbage disposal without checking whether your septic tank can handle the added volume.
- 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.

## Managing your septic system



### Septic system care – NEVER!

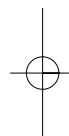
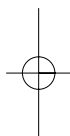
**NEVER** flush these items into the tank (they cannot be broken down by bacteria or will destroy the bacterial action):

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

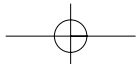
**NEVER** flush chemicals into the tank (they could contaminate surface and groundwater):

- paints
- varnishes
- thinners
- waste oils
- photographic solutions
- pesticides or herbicides





Inside Back Cover – Blank



## New Well or Septic System? Buying a Home?

New wells and septic systems must be designed carefully to protect our water resources. Wells must be drilled by a licensed water well contractor, who submits a water well record to the homeowner and the Ministry of the Environment. Septic systems are designed and installed under inspection.

### Contact:

- the Eastern Ontario Health Unit, toll free at 1(888) 568-8848 for Stormont, Dundas, Glengarry, and Prescott-Russell inquiries;
- the Leeds, Grenville & Lanark District Health Unit at (613) 345-5685 for the Leeds, Grenville and Lanark area inquiries;
- the Ottawa Septic System Office at 692-0160 for Ottawa inquiries.

All of these offices conduct septic system inspections, have a list of licensed contractors in their area that install wells and septic systems, and a sewage system permit can be obtained.

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.



**For more information call the South Nation Conservation office at 1(877) 984-2948, web site: [www.nation.on.ca](http://www.nation.on.ca), or the Raisin Region Conservation Authority at (613) 938-3611, web site: [www.rcca.on.ca](http://www.rcca.on.ca). These Conservation Authorities are acting as secretaries for the Eastern Ontario Water Resources Committee.**

**[www.nation.on.ca/eowrc](http://www.nation.on.ca/eowrc)**