

# Source Water Protection in the CTC

What you need to know about source protection

[www.ctcswp.ca](http://www.ctcswp.ca)

The goal of the Clean Water Act is to protect the sources of municipal drinking water from pollution and overuse.

The Clean Water Act may affect you. Find out how.

## Identifying the threats to our water supplies

The Clean Water Act, 2006 was passed by the Ontario government in 2006 to protect the sources of municipal drinking water from contamination or overuse. Studies are underway to identify the potential threats to municipal drinking water in the CTC Source Protection Region. This region includes the Credit Valley, Toronto and Region and Central Lake Ontario Source Protection Areas.

The studies are focused on vulnerable areas near municipal wells (Wellhead Protection Areas) and surface water intakes (Intake Protection Zones). These are areas where particular care must be taken in the use and storage of materials that could contaminate water. Activities on properties in these vulnerable areas are being evaluated and ranked according to rules developed by the Ontario government. Potential threats to water will be placed into one of three categories based on the level of risk: low, moderate or significant.

## What is an Assessment Report?

Information on vulnerable areas and potential threats is being collected into Assessment Reports. There will be one report for each Source Protection Area. They will be made public and posted at [www.ctcswp.ca](http://www.ctcswp.ca). Public meetings will be held in each Source Protection Area to give people a chance to review the information and comment on it.

The Assessment Reports will:

- identify the vulnerable areas near wells and intakes;
- identify the types and number of threats to water quality near wells and intakes;
- rank the potential threats as low, moderate or significant

After the Assessment Reports are complete and approved by the Ontario Ministry of the Environment, work will start on Source Protection Plans for each watershed. These plans will outline what needs to be done to reduce the risk posed by significant threats and to prevent new ones from developing. They will be completed in August 2012.

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## Source Protection Timeline

	2005	2006	2007	2008	2009	2010	2011	2012
Watershed Studies	██████████							
Municipal Technical Studies		██████████						
Terms of Reference				██████████				
Assessment Report					██████████			
Source Protection Plans							██████████	

## What is the CTC Source Protection Region?

This region covers 3 watersheds that drain into Lake Ontario; Credit Valley, Toronto and Region and the Central Lake Ontario. A 21 person committee, plus chair, is responsible for developing source protection plans for these Source Protection Area. The plans will outline policies and programs to eliminate significant threats to the water supply as well as reduce the opportunity for low and moderate threats to become significant.



## Who is the CTC Source Protection Committee?

The source protection committee is an independent group comprised of:

- Farmers
- Businesses
- Municipalities
- Residents
- First Nations

Source Protection Committees have been established in watersheds across Ontario to lead development of Source Protection Plans.

## Grants for Early Actions to protect water

The Ontario Drinking Water Stewardship Program provides grants to property owners to help them take action on their land to protect drinking water sources. Early grants may be available for a variety of projects to those who own land near municipal wells including:

- replacing or upgrading old septic systems
- decommissioning of old private wells, or upgrading wells still in use
- free and confidential Pollution Prevention Reviews for small and medium sized businesses to identify problems and develop solutions
- a range of agricultural best management practices to protect water quality

To learn more, go to [www.ctcswp.ca](http://www.ctcswp.ca) and look under Financial Assistance.



[www.ctcswp.ca](http://www.ctcswp.ca)

## How are possible threats identified?

Researchers working for municipalities and conservation authorities have used a variety of means to identify the possible location of potential threats. They have examined documents such as publicly available industrial databases. In some cases, they have obtained information directly from property owners. They also made some assumptions, such as that a rural home would have a septic system.

The Assessment Reports will identify the number and type of potential threats in the CTC's Wellhead Protection Areas. Individual property owners will be notified if we believe their land contains a significant threat.

The Clean Water Act, 2006 identifies different types of threats to drinking water. These threats are:

- Waste Disposal sites (also known as landfills)
- Sewage systems
- Septic systems
- Agricultural and non-agricultural source materials applied to land, stored, handled or managed
- Commercial fertilizer applied, handled or stored
- Pesticides applied to land or stored
- Snow stored
- Fuel handled or stored
- Activities taking water from an aquifer (groundwater) or surface water (lake or river)
- Activities that reduce the amount of water returned to a well's underground water sources
- Livestock grazing, pasturing, outdoor confinement areas and farm-animal yards
- Dense, non-aqueous phase liquids (Chemicals or mixtures of chemicals that are heavier than water, and are only slightly soluble in water) handled or stored
- Organic solvents (e.g. paints/paint thinners, glues, nail polish removers) handled or stored

## Calculating threat levels:

low, moderate or significant

There are many potential threats to drinking water in our urban and rural areas, but the level of risk they pose depends on the nature of the threat and its location. The Clean Water Act, 2006 requires the elimination of the threats that pose the greatest risk. These are called significant threats.

To decide which threats are significant, the Ontario Ministry of the Environment has developed a formula to calculate a risk score based on:

- the hazard rating of the threat, on a 10-point scale
- the vulnerability of the water source, on a 10-point scale

## How is the risk score calculated?

The risk score is calculated by multiplying the hazard rating by the vulnerability score. The result will be a number on a 100-point scale.

risk score = hazard rating x vulnerability score

Based on the results of the calculation, threats are placed into one of three categories:

	Risk score
Significant threat	80 to 100
Moderate threat	60 to 79
Low threat	41 to 59

The Ministry of the Environment has developed tables showing the level of risk posed by hundreds of combinations of threats and vulnerability. These tables are available at [www.ctcswp.ca](http://www.ctcswp.ca) under Technical Work/Assessment Reports.



## Who could be affected by Source Protection Planning?

The source protection planning process could affect industries, farmers, businesses, rural residents and others who own property in the protection zones around municipal wells. It's of particular importance to property owners who use or store materials that could pose a risk to municipal drinking water sources. These include chemicals, fertilizers, manure, human waste found in septic systems and other materials.

## What if there is a 'significant threat' on your property?

The Assessment Report will list the number and type of significant threats near municipal water sources. Property owners will receive individual notification if an activity on their land has been identified as a potential significant threat. They will then have the opportunity to provide additional information about the nature of the activity and anything they have done to reduce the impact on water sources.

## How will significant threats be dealt with?

Source Protection Plans will outline the steps that must be taken in a watershed to reduce the risk posed by significant threats. These plans could propose a variety of approaches such as incentive programs, monitoring activities, risk management plans, changes to municipal land use policies and others.

However, there are actions that property owners can take now to decrease the risk that an activity on their lands could pollute a drinking water source.

## What is vulnerability?

The word vulnerability describes how easily a well can become polluted with a dangerous material. Researchers have studied each municipal well in the CTC Source Protection Region to determine how vulnerable they are.

Aquifers are replenished when water from rain and melting snow soaks into the ground. Sometimes, the water also carries pollutants. It can take years, or even decades, for water to reach a well. The speed depends on the characteristics of the soil and bedrock in the area.

## Wellhead Protection Areas

Wells draw water from underground areas called aquifers where water fills cracks in bedrock or spaces between grains of sand, gravel or dirt.

Aquifers are replenished when water from rain and melting snow soaks into the ground. Sometimes, the water also carries pollutants. It can take years, or even decades, for water to reach a well. The speed depends on the characteristics of the soil and bedrock in the area.

The various zones that make up a WHPA are based on how long it would take a contaminant to move horizontally through an aquifer and into the well. For the purposes of source protection Assessment Reports there are 4 WHPA zones:

- 100-metre area: The area where the risk to the well is highest and the greatest care should be taken in handling any potential contaminant.
- 2-year time of travel: In the second ring, bacteria and viruses from human and animal waste are a concern, as are hazardous chemicals.
- 5-year time of travel: Biological contaminants, such as animal waste, are less of a concern in the third ring but chemical pollutants remain a concern.
- 25-year time of travel: The most persistent and hazardous pollutants remain a concern.

The size and shape of a WHPA is determined by a variety of factors including the way the land rises or falls, the amount of water being pumped by the well, the type of aquifer, the type of soil surrounding the well, and the direction and speed that the groundwater travels. The WHPAs delineated in the CTC have used the best information available and where the information is unclear a conservative approach is used.

## Measuring groundwater vulnerability

To determine the vulnerability score for a well, researchers have to answer two questions:

1. How quickly does water move horizontally through the aquifer to the well?
2. How quickly does water move vertically from the surface down to the aquifer?

The first question provides information which is used to draw Wellhead Protection Areas (WHPA) around each well.

The second question is called the intrinsic vulnerability.

The answers to the two questions are combined to come up with vulnerability scores on a 10-point scale for all the land within Wellhead Protection Areas for every municipal drinking well.

- An area of high vulnerability has a score of 8 or 10.
- An area of moderate vulnerability has a score of 6.
- An area of low vulnerability has a score of 4.

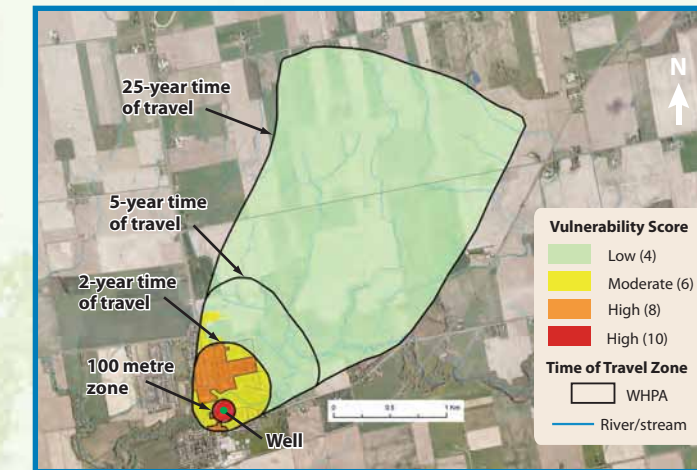
To determine if an activity in a WHPA is a significant threat a calculation of the hazard score and vulnerability conducted.

Learn more about identifying threats on page 5.



Communities rely on wells (groundwater) or intakes (surface water) for their water supply. Both can be vulnerable to pollution.

## Wellhead Protection Area



### A note about the map:

This map is a representation of a Wellhead Protection Area. It is an example only and should not be taken to provide information for a real well.

## Examples of significant threats

### Residential

A home located near a municipal well has an old, failing septic system and raw sewage is leaking into the ground. The area has a vulnerability score of 10 and the sewage has a hazard rating of 10. The result is a risk score of 100 making the septic system a significant threat.

### Farm

A farmer spreads manure on his fields to fertilize them. There is a municipal well on the property next door. The vulnerability score for the farmer's land is 10. The hazard rating for manure is 8. The result is a risk score of 80, making it a significant threat.

## Threats to Wells

## What are threats?

Researchers have studied the areas around municipal wells to identify the human activities that could threaten municipal water supplies.

There are two categories of threats – chemicals and pathogens:

- Chemical threats include things like solvents, fuels, fertilizers, pesticides and similar products. They can be found in factories, storage depots, gasoline stations, farms or other places.
- A pathogen is a dangerous bacteria or virus found in human or animal waste. Human pathogens can be found in septic tanks. Manure contains animal pathogens.

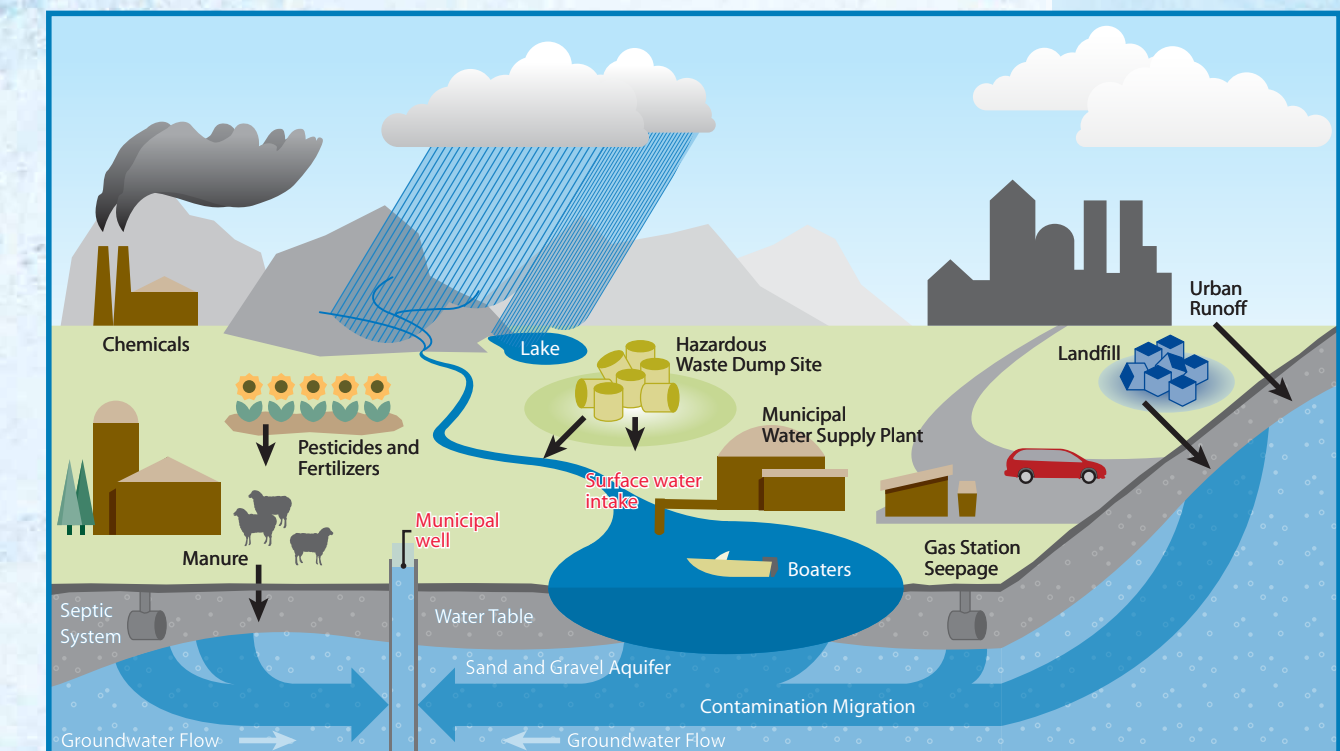
## Hazard ratings

Not all threats are equal. The danger posed by particular chemicals or pathogens depends on several factors including the amount, its toxicity and how it behaves in the environment.

The Ontario Ministry of the Environment has identified many materials that could contaminate water. It has assigned a hazard rating to each using a 10-point scale based on the nature of the material and how it is used or stored.

To learn how threat levels are calculated and how threats are identified, see page 5.

Significant Threats may also be identified in other vulnerable areas such as Intake Protection Zones and Highly Vulnerable Aquifers. Landowners located in these vulnerable areas will receive an information package similar to this, but with specific information about their vulnerable area.



Based on graphic from The Groundwater Foundation: [www.groundwater.org/gi/sourcesofgwcontam.html](http://www.groundwater.org/gi/sourcesofgwcontam.html)



There are many types of potential threats to water in rural and urban areas.