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www.sourcewater.ca

The Source

News about the Clean Water Act

for the Grand River, Long Point Region, Catfish Creek and Kettle Creek watersheds

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 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 four watersheds: Grand River, Long Point Region, Catfish Creek and Kettle Creek. They make up the Lake Erie Source Protection Region.

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 watershed. They will be made public and posted at www.sourcewater.ca. Public meetings will be held in each watershed to give people a chance to review the information and comment on it.

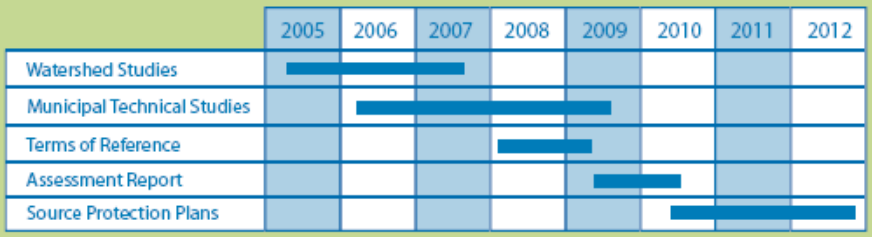
The Assessment Reports will:

- 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 Minister 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 complete by 2012.

Page 2 Who could be affected?
Page 3 What is vulnerability?
Page 3 Wellhead Protection Areas
Page 3 Intake Protection Zones
Page 4 What are threats?
Page 5 Calculating threat levels
Page 6 Grant program

Source Protection Timeline



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 and surface water intakes. 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. However, individual properties will not be identified. 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.

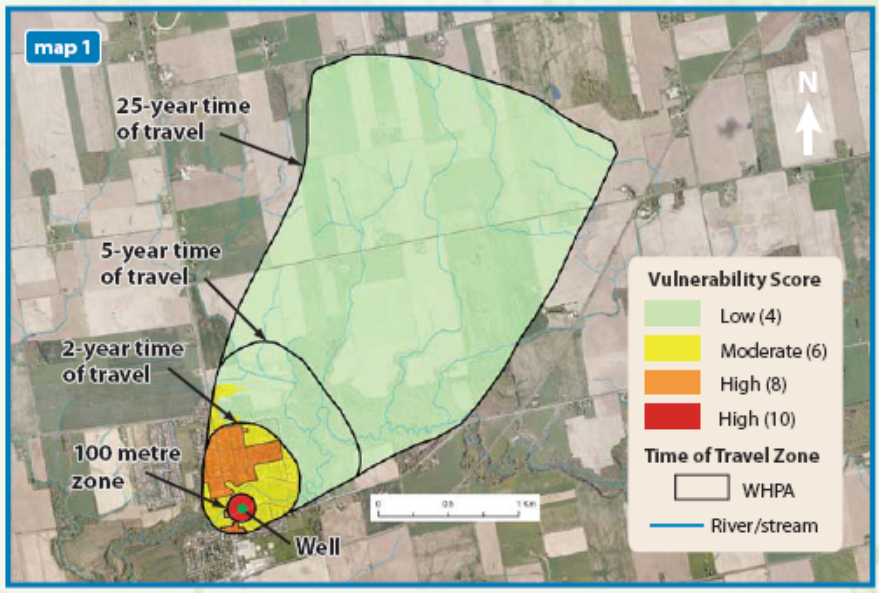
How will significant threats be dealt with?

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

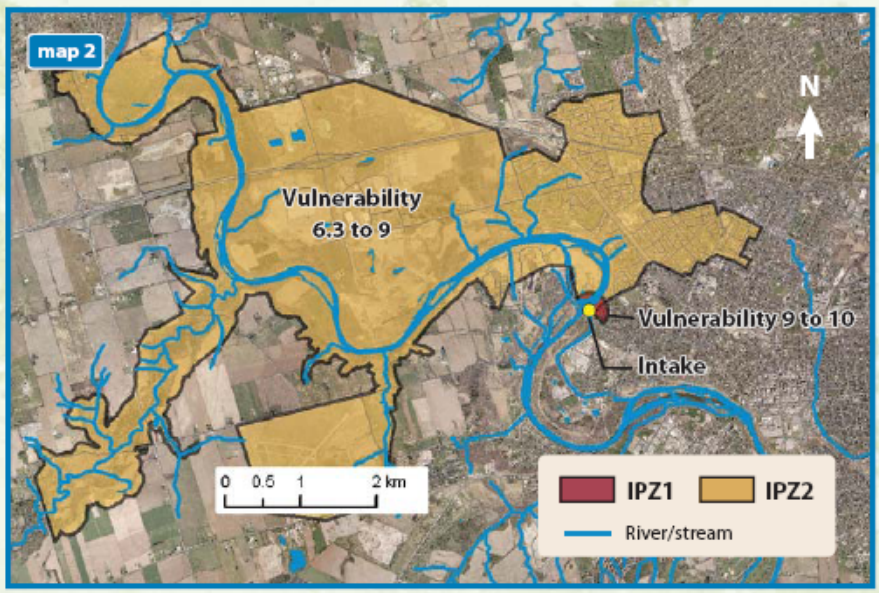
However, there are actions that property owners can take now to decrease the risk that an activity on their lands could pollute a drinking water source. For more information on Early Actions grants for landowners, see page 6.

Wells & Intakes

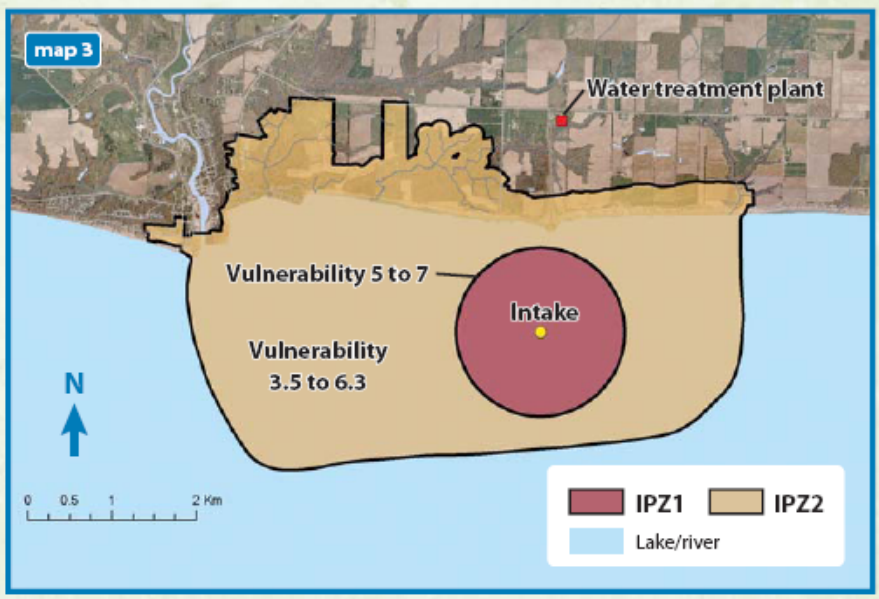
Wellhead Protection Area



Intake Protection Zone - river



Intake Protection Zone - lake



What is *vulnerability?*

The word **vulnerability** describes how easily a well or intake can become polluted with a dangerous material. Researchers have studied each municipal well and intake in the four watersheds of the Lake Erie Region to determine how vulnerable they are. There are five Lake Erie intakes, five river intakes and about 225 wells.

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.

Measuring groundwater vulnerability map 1

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

- How quickly does water move **horizontally** through the aquifer to the well? The information was used to draw Wellhead Protection Areas (WHPA) around each well. WHPAs are divided into rings called Time of Travel Zones. The innermost zone is a 100-metre circle. The other zones are set at times of travel of 2 years, 5 years (or 10 years) and 25 years.

- How quickly does water move **vertically** from the surface down to the aquifer? This is called "intrinsic vulnerability."

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

A note about the maps:

These maps are representations of the three types of source areas. These are examples only and should not be taken to provide information for real wells and intakes.

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

Intake Protection Zones

River and lake intakes can be contaminated when dangerous materials are spilled into the water or on nearby land and make their way to the intake. **Intake Protection Zones (IPZ)** are areas where dangerous materials may get to an intake so quickly the operators of the municipal water treatment plant may not have enough time to shut down the intake before the pollutant reaches it.

Measuring surface water vulnerability maps 2 & 3

Researchers studied how water moves in the area around each intake. For a **river intake**, they looked at how quickly it gets to the intake during high and low flows. For a **lake intake**, they studied how the movement of water is affected by currents and winds. For both types of intakes they identified streams, municipal storm sewers and rural drains that enter the river or lake near the intake.

Intake Protection Zones were drawn around the intakes and assigned vulnerability scores on a 10-point scale:

- **IPZ1:** For a river intake, a semi-circle 200 metres upstream of the intake with vulnerability scores of 9 to 10. For a lake intake, a one-kilometre circle around the intake with vulnerability scores of 5 to 7.

- **IPZ2:** The area where water can reach the intake in a specified time, usually two to six hours. For a river intake, vulnerability scores range from 6.3 to 9. For a lake intake, scores range from 3.5 to 6.3.

- **IPZ3:** Areas where there are activities further away from the intake which could have an impact on water quality. Vulnerability scores are less than in the IPZ2.

What are *threats?*

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

There are two categories of threats – chemicals and pathogens:

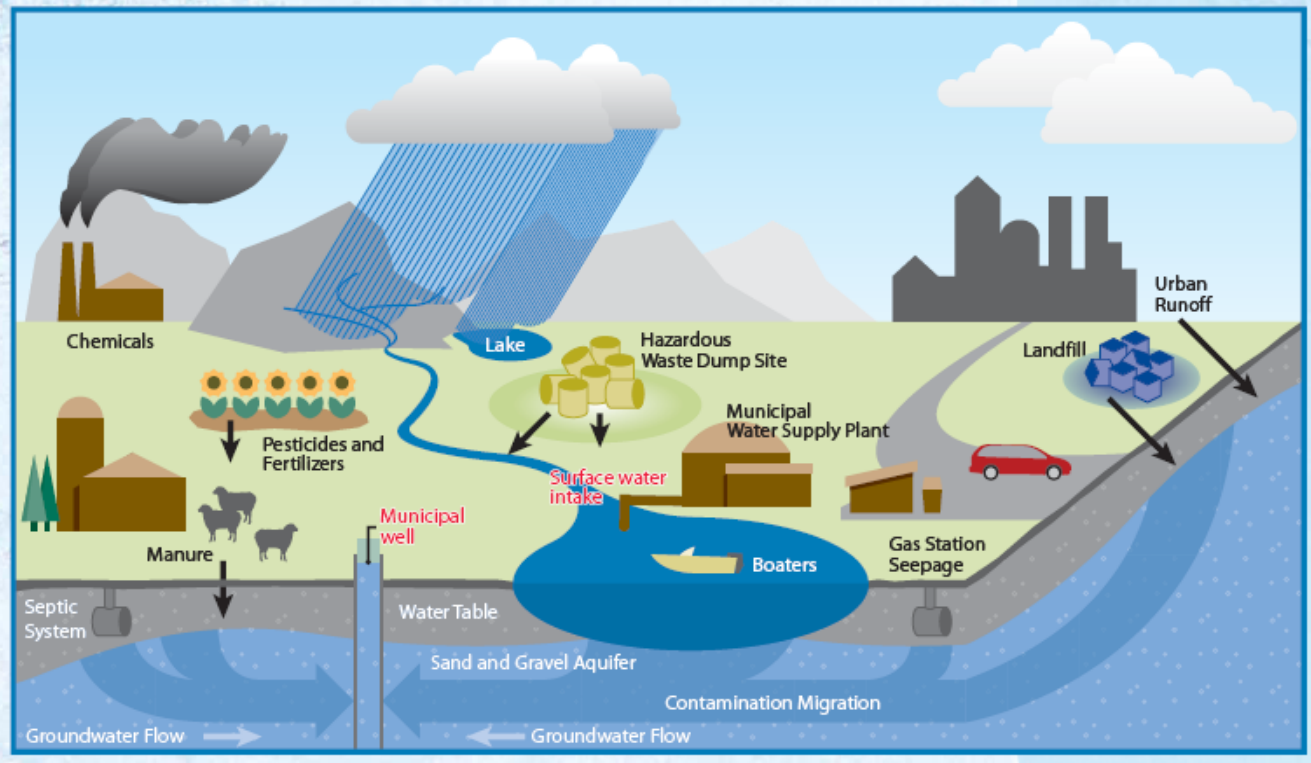
- **Chemical threats** include things like solvents, fuels, fertilizers, pesticides and similar products. They can be found in factories, storage depots, gasoline stations, farms or other places.
- A **pathogen** is a dangerous bacteria or virus found in human or animal waste. Human pathogens can be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



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

Based on graphic from The Groundwater Foundation: www.groundwater.org/gi/sourcesofgwcontam.html

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 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.sourcewater.ca***

How are possible threats identified?

Researchers working for conservation authorities or municipalities 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 location of properties containing potential significant threats will not be identified in the Assessment Report. The report will only identify the number and type of potential threats in the wellhead and intake protection areas. Individual property owners will be notified if it is believed their land is the site of a potential significant threat.

Examples of significant threats

Industrial or commercial

A solvent is stored in a tank close to a river intake. If the tank were to leak, the chemical could get to the intake in a short period of time. The chemical has a hazard rating of 9. The vulnerability score for the intake is 10. The risk score (hazard x vulnerability) would be 90, making it a significant threat.

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.

What is
the Lake Erie Source Protection Region?

This region covers four watersheds that drain into Lake Erie: Kettle Creek, Catfish Creek, Long Point Region and the Grand River. A 25 person committee is responsible for developing source protection plans for these watersheds. 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 Lake Erie 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 Action grants are available for a variety of projects to those who own land near municipal wells and surface water intakes, 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.sourcewater.ca and look under Stewardship Program. Or contact your local conservation authority:

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