

DRINKING WATER SOURCE PROTECTION

The Act, The Process, Threats, BMPs



DRINKING WATER SOURCES

In this region, municipal drinking water comes from both surface water and groundwater sources. Surface water sources may include lakes, rivers and streams. Our main source of surface water is Lake Huron. Groundwater in our region comes from underground aquifers, which supply water to municipal and private wells. These sources can be contaminated and can create long-term issues that are costly to fix. Some cannot be fixed, which is why it is important to protect our drinking water sources. Source protection is the first step to protect existing and future sources of drinking water by reducing the contamination risk.

WHAT IS GROUNDWATER?

Groundwater is found in aquifers under the ground. Aquifers are underground areas of rock or loose material that are saturated with water. Wells are drilled into aquifers to access water for home and/or business use. Aquifers exist in many sizes; some may be the size of a 100 acre field or the size of a small town. It is very difficult to measure where one aquifer starts and stops so it is vital that the activities on the surface of the earth be done in a way that avoids contaminating these underground sources of water. Aquifers are shared water resources; they are not linked to any one individual property. What affects the aquifer has a ripple effect on everyone that uses it for their water supply. Contamination originating on one property can affect the water of that property and many neighbouring ones. Positive actions to protect the water benefit both the individual and the community as a whole.

WHAT IS SURFACE WATER?

Surface water from Lake Huron and Georgian Bay supplies about half of the population in our region with their drinking water. Threats in the areas that surround large residential municipal intakes in the Great Lakes cannot be significant. This is because intakes in the Great Lakes can have a maximum vulnerability score of seven due to the factors that determine the vulnerability.

CLEAN WATER ACT AND DRINKING WATER SOURCE PROTECTION

The Clean Water Act, 2006, took effect in 2007 with the goal of safeguarding human health through the protection of the sources of municipal drinking water systems. A key part of the Act is to create three major documents prepared by a local Source Protection Committee. These documents are the Terms of Reference, Assessment Report and Source Protection Plan. Each will be discussed further in this factsheet.



Drinking Water Source Protection is a program that is working in your area to protect municipal drinking water sources. Activities near sources of drinking water can affect the quality and quantity of that water. The local Source Protection Committee for the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region has recently submitted a report on drinking water sources, known as the Proposed Assessment Report. The Source Protection Committee will create a plan by 2012 that will contain policies to protect drinking water sources.

The three key documents that are part of the Drinking Water Source Protection program are the Terms of Reference, Assessment Report and Source Protection Plan.

Assessment Reports and Source Protection Plans

- The local **Terms of Reference** was approved by the Minister of the Environment on August 17, 2009. It explains the process and tasks that need to be completed to develop the other two documents. It includes roles, responsibilities and timelines.
- The approved **Assessment Report** contains past and present water quality and quantity conditions, as well as projections for future water needs. The report describes research findings in detail. It explains the water resources in the area. The report shows activities that are, or would be, significant drinking water threats under particular circumstances. The threats identified in this report will be the ones that are used for developing policies as part of the Source Protection Plan. The local Proposed Assessment Report was submitted to the Ministry of the Environment in September 2010.
- The **Source Protection Plan** will describe the steps that must be taken by various agencies and landowners to protect our surface water and groundwater sources. The plans will provide policies to reduce risks to ensure significant threats are no longer significant and potential threats never become significant.

Maps have also been created to show municipal water sources and the areas that can contribute water to them in the local Source Protection Region. These are called wellhead protection areas (WHPAs) for groundwater wells and intake protection zones (IPZs) for surface water lake intakes. These areas and zones have been given scores and ratings based on their vulnerability and susceptibility to contamination. This information is included in map format in the Proposed Assessment Report. There is a report for each of the three Source Protection Areas (SPAs) that make up our Source Protection Region. The local SPAs are: Saugeen Valley Source Protection Area, Grey Sauble Source Protection Area and Northern Bruce Peninsula Source Protection Area.

Landowners can access maps for each water system in this source protection region that identifies the vulnerable areas and vulnerability scores. Visit <http://www.waterprotection.ca/par/par.htm> to see the Assessment Report for your area and its associated maps. Call the local Drinking Water Source Protection office if you need help navigating this website.

SOURCE PROTECTION PLANS AND POLICY DEVELOPMENT

The next major step of the Drinking Water Source Protection program is the creation of the Source Protection Plan (SPP). This plan will include policies that will address the significant drinking water threats listed in the Assessment Report.

The Province of Ontario has developed a table of activities that may be threats to drinking water. A list of activities that could be significant drinking water threats has been generated for landowners with significant threats identified. The list is based upon the type of land use according to Municipal Property Assessment Corporation (MPAC) property codes and a North American Industrial Classification System (NAICS) code. In

order for the activity to be a significant drinking water threat, certain circumstances must occur. An activity may be listed for your property based on land use but it may not be present at this time. Based on land use rating, all activities that could be occurring must be included in individual landowner notifications. Visits to landowner property have not taken place to confirm activities.

The local Source Protection Committee must write policies to address potential significant threats, as per the Clean Water Act - Ministry of the Environment. It is optional to create policies for moderate and low threats; recommendations may be made to address these threats.

Source Protection Plans (SPP) will not be completed until 2012. Under recently approved provincial regulations, the Source Protection Committee may utilize a range of tools. These tools include official plans, zoning by-laws, incentive programs, and education and outreach programs. In rare cases, restrictions and prohibition of certain activities may be used.

Individual properties with “are or would be significant” threats are not identified publicly, in keeping with privacy regulations; however, property owners with “are or would be significant” threats will be contacted by the local Drinking Water Source Protection office.

Each type of operation has its own specific challenges and could have activities that would pose a significant threat to drinking water. Certain locations in the Source Protection Region have been identified as having potential significant threats but they have not been confirmed on a site by site basis. They were determined using property codes, structures and activities that “might” occur. Just because an activity is not currently taking place on a property does not eliminate that property from the potential to host a significant threat if the property was to change owners or undergo construction of new facilities.

Monitoring, through testing of drinking water quality on the farm, can be an indicator of the quality of water in the local aquifer, as it is often in close proximity to farm activities. The impact on other aquifers in close relation may be more difficult to determine without sampling.

THE THREATS TABLE AND POLICY DEVELOPMENT

What are threats?

A threat is an activity that has a harmful effect, or the potential to have a harmful effect, on the quality or quantity of drinking water sources. The Ministry of the Environment for the Province of Ontario created a list of 21 threats, two of which are quantity threats and the rest are quality threats.

Quality Threats

1. The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the Environmental Protection Act.
2. The establishment, operation or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage.
3. The application of agricultural source material to land.
4. The storage of agricultural source material.
5. The management of agricultural source material.
6. The application of non-agricultural source material to land.
7. The handling and storage of non-agricultural source material.
8. The application of commercial fertilizer to land.
9. The handling and storage of commercial fertilizer.
10. The application of pesticide to land.

11. The handling and storage of pesticide.
12. The application of road salt.
13. The handling and storage of road salt.
14. The storage of snow.
15. The handling and storage of fuel.
16. The handling and storage of a dense non-aqueous phase liquid (DNAPL).
17. The handling and storage of an organic solvent.
18. The management of runoff that contains chemicals used in the de-icing of aircrafts.
21. The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard.

Quantity Threats

19. An activity that takes water from an aquifer or a surface water body without returning the water taken to the same aquifer or surface water body.
20. An activity that reduces the recharge of an aquifer.

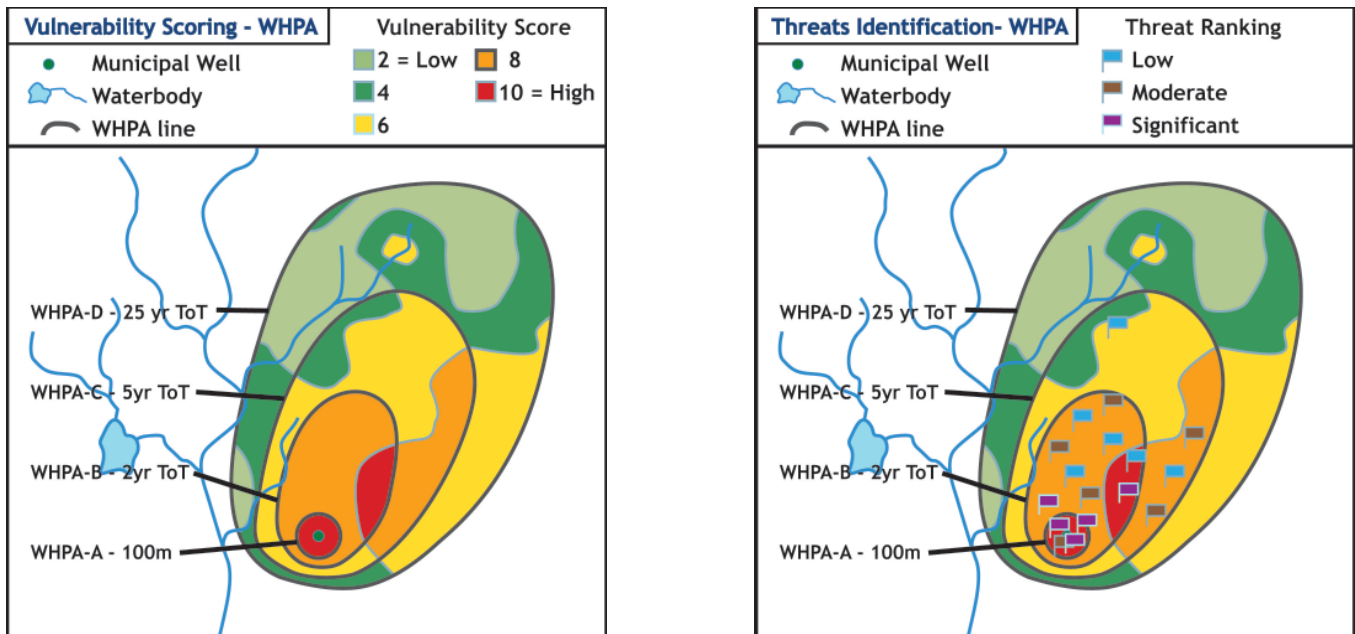
These 21 threats contain three types of threats: chemical, pathogen and DNAPL (dense non-aqueous phase liquids) threats. These threats are flagged in areas with a high vulnerability score, which is generally from eight to ten. This chart provides which category the 21 threats fall into, chemical, pathogen or DNAPL, and examples.

	Chemical	Pathogen	DNAPL
Threats Table Reference	1-4, 6-15,17,18,and 21	1-7 and 21	16
Examples	Agricultural Source Material (ASM) - manure	Agricultural Source Material	Electrical transformer oils, PCBs, solvents, degreasers, organic solvents
	Non-agricultural Source Material (NASM) - food processing waste, pulp and paper waste, sewage bio-solids	Non-agricultural source material application, handling and storage (food processing waste, pulp and paper waste, sewage bio-solids)	Paint thinners, nail polish removers, glue solvents, spot removers, and dry cleaning solutions
	<ul style="list-style-type: none"> • Waste disposal • Manure application and management • Commercial fertilizer application, handling and storage • Pesticide application, handling and storage • Fuel handling and storage • Organic solvent handling and storage 	<ul style="list-style-type: none"> • Waste disposal • Sewage systems • Manure application, storage and management • Livestock grazing 	<ul style="list-style-type: none"> • Spot removers • Degreasers • Paint thinners

The complete threats table that was created by the Ministry of the Environment can be found on this website: http://www.ene.gov.on.ca/en/water/cleanwater/cwadocs/Tables_Drinking_Water_Threats_16Nov09.pdf

The material in this Fact Sheet is a summary of legislation. The reader should refer to the complete Clean Water Act and associated regulations for full details. Please note that other legislation outside of the work of the Clean Water Act may apply to your property. It is suggested that you consult with other regulatory agencies relevant to your operation.

The Tables of Drinking Water Threats identifies areas where an activity, under certain circumstances, is or would be a threat to drinking water. Threats can be classified as significant, moderate or low.



The diagram on the left indicates the vulnerability for different zones near the water supply. The diagram on the right indicates where threats would be low, moderate or significant based on the vulnerability.

The Tables list numerous circumstances for each activity. Therefore, the Tables are hundreds of pages long. The Tables were developed to help the Source Protection Committee identify significant threats taking into account activities and circumstances.

Chemical threats are listed in the provincial Tables with details such as the substance, the quantity of this substance, the vulnerable area, and the vulnerability score of this vulnerable area. Finally, the hazard rating is defined and the risk rating is listed for each vulnerable area and vulnerability score. Chemical threats can exist in any vulnerable area, but the risk rating decreases with a longer time of travel.

DNAPL threats are a sub category of chemical threats. DNAPLs are dense non-aqueous phase liquids. These liquids are highly toxic and more dense than water and do not dissolve or mix easily in water. Due to their adverse transport behaviour in groundwater aquifers as well as their high toxicity and persistence, the risk rating for these chemicals is “significant” at any quantity if the vulnerability score is at least four and the activity is located in a WHPA A, B or C.

Pathogen threat ratings take a similar approach; however, the circumstances do not specify minimum storage or application quantities for pathogen threats. To account for relatively short survival times of pathogens, the risk rating is “none” if the time of travel from the activity to the intake or well exceeds two years. Thus, pathogen threats can only exist in WHPAs A and B and when surface water can influence the intake in IPZs 1-3 and WHPAs E-F).

The following is an example from the Threats Table:

The activity in the table below is the application of pesticide to land. For example:

- A landowner lives in an **WHPA-A**
- The vulnerability score is **ten**
- This landowner applies pesticide to their land
- The area where they apply the pesticide is **more than ten hectares**
- The application can result in of MCPA (2-methyl-4- chlorophenoxyacetic acid) in ground or surface water.

Therefore, this pesticide application is a significant threat.

Drinking Water Threat	Circumstances	Vulnerable Area	Threat is Significant in areas with a Vulnerability Score of:	Threat is Moderate in areas with a Vulnerability Score of:	Threat is Low in areas with a Vulnerability Score of:
The application of pesticide to land.	<p>1. The area of land to which the pesticide is applied is more than 10 hectares.</p> <p>2. The application may result in the presence of MCPA (2-methyl-4- chlorophenoxyacetic acid) in ground-water or surface water.</p>	IPZ-1 IPZ-2 IPZ- WHPA-E	8.1-10	6.3-8	4.2-6
		WHPA-A WHPA-B WHPA-C WHPA-D	10	8	6
		HVA			6
		SGRA			6

WHAT IS A “BEST MANAGEMENT PRACTICE”?

A best management practice can be defined as:

“a practical, affordable approach to conserving a farm’s soil and water resources without sacrificing productivity”

Source - <http://www.omafra.gov.on.ca/english/environment/bmp/series.htm>

In relation to protecting drinking water sources, best management practices would include taking steps on your operation to manage crop inputs, livestock and wastes in a responsible manner such as ensuring that drinking water sources do not become contaminated. Farming operations can be quite complex. Time and effort needs to be devoted to how your operation may impact local water sources - groundwater and surface water. Agriculture and Agri-Food Canada, Ontario Federation of Agriculture and the Ontario Ministry of Agriculture and Foods have created a series of books that are valuable references in best management practices.

The list on the following page contains some of the Best Management Practice books available from the Service Ontario website - <https://www.publications.serviceontario.ca/ecom/>, Grey Agricultural Services in Markdale or the local Ontario Ministry of Agriculture, Food and Rural Affairs office in Walkerton.

Order #	Title	Order #	Title
BMP07E	Water Management	BMP14E	Nutrient Management Planning (revised edition 2006)
BMP08E	Irrigation Management	BMP15E	Buffer Strips
BMP09E	Integrated Pest Management	BMP16E	Manure Management
BMP10E	Fish and Wildlife Habitat Management	BMP19E	Streamside Grazing
BMP12E	Water Wells	BMP20E	Managing Crop Nutrients
BM12KE	Keeping Your Well Water Safe to Drink (An Information Kit to Help You Care for Your Well)	BMP 22E	Deadstock Disposal
BMP13E	Pesticide Storage, Handling and Application	BMP 23E	Application of Municipal Sewage Biosolids to Cropland



A berm at entryway to manure storage facilities helps to keep roof or yard runoff from entering storage area.

Example of a Best Management Practice



Covered manure storage prevents extra moisture from entering storage.

Funding Programs Available to the Agricultural Community

Environmental Farm Plan: An excellent way to take inventory of your farm activities is to complete an Environmental Farm Plan. There is cost-sharing through this program that can provide funds for on-farm projects. The Environmental Farm Plan is administered by Ontario Soil and Crop Improvement Association. Contacts for these programs locally can be found at www.ontariosoilcrop.org.

Ontario Drinking Water Stewardship Program: The Early Response Program, administered by Drinking Water Source Protection, will be available to landowners with significant threats. Eligible projects must be risk management measures in the Ministry's Provincial Risk Management Measures Catalogue. To access this catalogue use the following URL: <http://maps.thamesriver.on.ca/swpCAMaps/rmc/disclaimer.aspx>. For more information, contact Drinking Water Source Protection at 519-470-3000 or 1-877-470-3001.

Municipal or County programs: Check with your county or municipality. They may have a program available for clean water projects.



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"Threats Factsheet - General" is one in a series of Commodity Best Management Practice factsheets related to the Drinking Water Source Protection program. These factsheets give an overview of potential drinking water threats and circumstances that are significant. Also included are some possible measures to manage these circumstances. Visit www.waterprotection.ca to view them online or visit your local OMAFRA office for a copy.

Titles in the Threats Factsheet series: General; Row Crop; Livestock; Horticulture; Chemical & Fuel.

This factsheet was prepared for the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region. This region covers the Saugeen Valley and Grey Sauble watershed regions, as well as the Municipality of Northern Bruce Peninsula.



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