



# Understanding *Source Protection Planning*

IN THE NORTH BAY - MATTAWA SOURCE PROTECTION AREA



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generous support of the  
Government of Ontario

This guide was prepared by the Communication Specialist for the North Bay - Mattawa Source Protection Area. Some content and text has been adapted from "A Guide to Source Water Protection in the Lake Erie Source Protection Region."

The goal of the guide is to provide background information on the history of the Clean Water Act and to explain how source protection planning will be implemented in the North Bay - Mattawa Source Protection Area.

If you have any questions about the North Bay - Mattawa Source Protection Area, the Clean Water Act or Source Protection, please contact a member of the North Bay - Mattawa Source Protection project team at (705) 474-5420 or [www.nbmca.on.ca](http://www.nbmca.on.ca).

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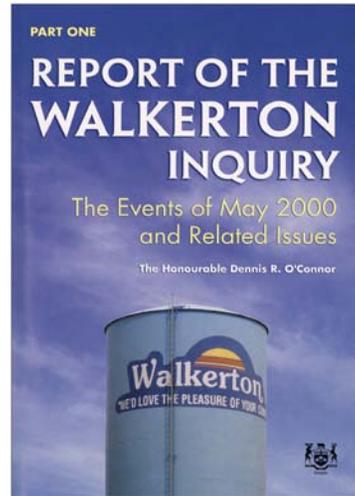
# Contents

TRAGEDY IN WALKERTON	2
IMPLEMENTING RECOMMENDATIONS	3
THE CLEAN WATER ACT	4
SOURCE PROTECTION PLANNING	5
CONSERVATION AUTHORITIES	6
THE ROLE OF THE NBMCA	7
SOURCE PROTECTION AUTHORITIES	8
SOURCE PROTECTION COMMITTEES	9
SOURCE PROTECTION REPORTS	10
FINANCING THE PLANNING PROCESS	11
MAP OF THE LOCAL SOURCE PROTECTION AREA	12
OVERVIEW OF THE SOURCE PROTECTION AREA	13
THE FIVE MUNICIPAL SYSTEMS	15
PROTECTING MUNICIPAL WELLHEADS	16
PROTECTING MUNICIPAL INTAKES	18
ISSUES AND THREATS	20
RISK ASSESSMENT	21
OTHER VULNERABLE AREAS	22
WATER SUPPLY ISSUES	23
PUBLIC INVOLVEMENT	24
PLAN APPROVAL	25
PLAN IMPLEMENTATION	26
RESOURCES AND INFO	27

# Originating in Walkerton, Ontario

THE CLEAN WATER ACT WAS DEVELOPED IN RESPONSE TO THE WALKERTON TAINTED WATER TRAGEDY.

In May 2000, heavy rains washed E. coli bacteria into a well that provided water to the municipal water system in Walkerton. A series of human and mechanical failures allowed the bacteria to get through the treatment system and into the municipal water supply. Seven people died and more than 2,300 became ill. As a result, Justice Dennis O'Connor of the Supreme Court of Ontario was appointed to investigate the Walkerton tragedy and provide advice on how similar events could be prevented in the future.



## CAUSES OF THE TRAGEDY

O'Connor's first report, released in 2002, described the causes of the Walkerton tragedy:

- contaminated water entered the municipal water supply system
- equipment to monitor water quality was not operating
- inadequately trained operators
- improper testing procedures
- poor monitoring and maintenance practices
- poor reporting and oversight

For more information and the full report, visit [www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/](http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/)

*“Although each barrier offers protection,  
no single barrier is perfect”*

– Justice Dennis O'Connor

## THE MULTI-BARRIER SYSTEM

In his second report, O'Connor recommended the development of a multi-barrier approach to protecting municipal drinking water throughout Ontario. Each barrier deals with one or more of the flaws that came to light in Walkerton.

*Provided by Conservation Ontario*



“The best way to achieve a healthy public water supply is to put in place multiple barriers that keep water contaminants from reaching people,” wrote O'Connor.

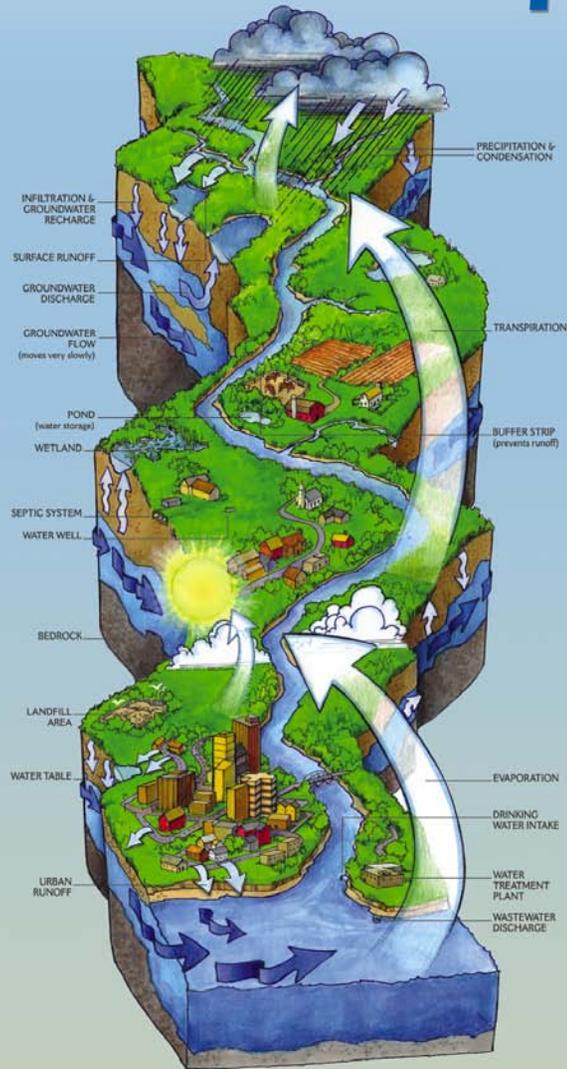
He identified five parts to the multi-barrier system:

- source water protection
- adequate treatment
- a secure distribution system
- proper monitoring and warning systems
- strategic responses to adverse conditions

With the exception of source water protection, four of the five barriers relate directly to municipal water treatment systems.

# WATERSHED Connections?

What makes up our Watersheds?



Courtesy of Conservation Ontario

## Implementing *The inquiry recommendations*

ADDRESSING THE NEED FOR A MULTI-BARRIER APPROACH TO DRINKING WATER PROTECTION.

Justice O'Connor's two reports, with 121 total recommendations, were released in early 2002. Many of the recommendations dealt with "end of pipe" issues relating to the operation and maintenance of the water treatment and distribution system. He recommended improvements in these areas to strengthen four of the five "barriers" to the contamination of municipal water supplies.

The Ontario government responded by passing two laws in 2002:

- *The Safe Drinking Water Act*
- *The Sustainable Water and Sewage Systems Act*

However, the first barrier in the multi-barrier system, source protection, had to be addressed differently. O'Connor saw it as a local planning process to be done "as much as possible at a local (watershed) level by those who will be most directly affected (municipalities and other affected local groups)."

He outlined a broad framework for a source protection plan. He cited some planning processes that had been used in various jurisdictions and could form the model for source protection planning in Ontario. In the end, he recommended protecting municipal water supplies on a watershed basis, an area of land where all water drains to the same lake or river. Groundwater and surface water systems are linked and activities upstream can affect water downstream, regardless of political boundaries. Thus, developing a source protection plan on a watershed basis made economical and scientific sense. This recommendation led the Province of Ontario to embark on the development of the Clean Water Act.

*"I recommend a source protection system that includes a strong planning component on an ecologically meaningful scale - that is, at the watershed level"*

– Justice Dennis O'Connor

# Developing *The Clean Water Act*

## TALKING TO MULTIPLE STAKEHOLDERS FOR INPUT ON THE PROPOSED LEGISLATION

A few months after the Walkerton report was released, the provincial government sought advice on what the source protection planning process should look like. It created a series of committees to examine the processes to develop source water protection plans, as well as to zero in on the many complex technical details. Most of these committees were made up of representatives of key stakeholder groups including agriculture, municipalities, industry, public health, environmental organizations, First Nations and others.

The reports from these committees were posted on the Environmental Registry for public comment. The Ministry of the Environment also held consultation meetings across the province, as well as at Queen's Park.

## THE LEGISLATIVE PROCESS

Following the consultation, the government introduced the Clean Water Act, also known as Bill 43, in December 2005.

Soon after, the province posted outlines of some proposed regulations on the Environmental Registry, asking for public comment. During the early part of 2006, the Ministry of the Environment continued consultation with key stakeholders throughout the province. Second reading debate was held in May 2006. At that point, the bill was referred to the legislature's Standing Committee on Social Policy. This committee held public meetings in Bath, Cornwall, Peterborough, Toronto and Walkerton during the week of Aug. 21. Public comments led to over 100 amendments. The bill passed third reading on Oct. 18, 2006 and was given Royal Assent the next day. The Clean Water Act was proclaimed on July 3, 2007.



## HISTORY OF THE CLEAN WATER ACT

Here are some of the key steps in the development of the Clean Water Act:

### 2002-04

Study papers and consultation with key stakeholder groups (municipalities, farmers, businesses, First Nations, conservation authorities, health officials, etc.)

### November 2002

Appointment of the Advisory Committee on Watershed-Based Source Protection

### November 2003

Two advisory committees named:  
Technical Experts Committee  
Implementation Committee

### February 2004

White Paper on Watershed-Based Source Protection Planning released for public comment

### June 2004

Draft Drinking Water Source Protection Act released for public comment

### December 2005

Clean Water Act (Bill 43) introduced  
Outlines of draft regulations posted on the Environmental Registry

### April-May 2005

Second reading debate

### August 2006

Public hearings by legislative committee

### October 2006

Third reading debate  
The Act is passed (October 18, 2006)



### STEPS TOWARD A PLAN

Once a local project team is in place at the conservation authority, a source protection committee formed and working groups created, the process of developing a source protection plan involves several steps:

#### Step One

Developing an understanding of the entire watershed and how water moves through it.

#### Step Two

Identifying source water and vulnerable areas surrounding each municipal water intake or well in a watershed.

#### Step Three

Identifying the threats to the municipal water system's source water within vulnerable areas.

#### Step Four

Establishing the risk posed by threats in the identified vulnerable areas (risk assessment)

#### Step Five

Elimination of significant threats and development of policies to ensure that existing drinking water threats are managed so as not to become significant and that future activities are appropriate for vulnerable areas.

# Creating *The Source Protection Plan*

## A KEY COMPONENT OF THE CLEAN WATER ACT

Through the Clean Water Act, the Government of Ontario has made a commitment to ensure that eventually every watershed in the province will have a source water protection plan. Where conservation authorities currently exist, there are 36 source protection areas that will be grouped into 19 source protection regions for administrative efficiency. Diverse stakeholders representing both watershed managers and water users will work together and agree on the best approach to take to protect water resources in each of our watersheds.

A source water protection plan is an agreement among the people and the municipalities of a watershed about the ways to protect water quality and quantity for municipal drinking water systems. A source protection plan will:

- safeguard human health
- ensure enough safe, clean water is available
- protect current and future sources of municipal drinking water from significant threats

The foundation of the plan is solid scientific knowledge about our water resources in the region. But it doesn't stop there. Once we have a good understanding of what is occurring in the source protection area, from a scientific standpoint, we'll have a better understanding of how best to protect it.

The plan will also detail land use and the impact of those activities/practices on our local drinking water quality. The process of developing source protection plans will be open and transparent.



# Facilitating *Why Conservation Authorities?*

## WATERSHED BASED EXPERTISE

Several possible models were considered for source water protection planning. In the end, O'Connor settled on a public planning process facilitated by conservation authorities. He said conservation authorities have the legal mandate, the experience and the local ties to bring everyone to the table.

Conservation authorities have decades of experience in water issues and water management. They have abundant knowledge and expertise to support the planning process. On top of that, conservation authorities were developed through partnerships with municipalities and since ultimately the municipalities will be responsible for implementing source protection plans, it makes sense to benefit from the existing partnership.

*“source protection must be undertaken on a watershed basis – the level at which cumulative impacts on the drinking water sources become apparent.*

*This implies the need for a planning body to operate at the watershed level, but with the full participation of the municipalities in the watershed. Such entities already exist for the watersheds that contain over 90% of Ontario's population: they are the conservation authorities”*

– Justice Dennis O'Connor

## NORTH BAY - MATTAWA CONSERVATION AUTHORITY

The North Bay-Mattawa Conservation Authority (NBMCA) was founded in 1972 by the Province of Ontario and the NBMCA's 10 member municipalities. A non-profit organization, the NBMCA works closely with the public to ensure the environmental health of the region's watershed. The NBMCA is one of 36 Conservation Authorities who are members of Conservation Ontario.



## CONSERVATION AUTHORITIES

- Are hands-on, community-based resource management organizations which protect, restore and effectively manage Ontario's water and land resources on a watershed basis
- Deliver local, practical solutions on a wide range of natural resource issues such as watershed management, source protection, flooding, erosion, drought and wetland conservation
- Use a science-based approach to develop, implement and monitor watershed management plans
- Are recognized globally for their watershed stewardship activities that address the needs of both the natural environment and landowners
- Provide advice on decisions that directly affect the long term sustainability of our water and land resources
- Are funded primarily by self-generated revenues and municipal levies with additional funding coming from provincial and federal governments
- Are governed by a local Board of Directors made up of municipally elected and appointed officials, and other stakeholders

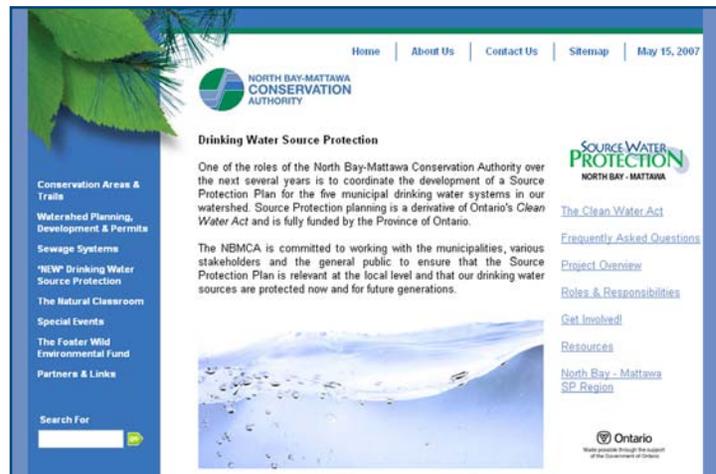
*Provided by Conservation Ontario*

## RESPONSIBILITIES OF THE NBMCA'S BOARD OF DIRECTORS IN RELATION TO SOURCE PROTECTION PLANNING

The North Bay - Mattawa Conservation Authority, as all of Ontario's 36 conservation authorities, has entered into a Memorandum of Agreement with the Province of Ontario to assume the administrative elements of drinking water source protection planning and to ensure the project is delivered as outlined by the Province. As such, the NBMCA's Board of Directors has two primary functions:

The **first** responsibility of the NBMCA's Board of Directors is to administer the provincial funding and supervise the project staff involved in Source Protection Planning in a manner similar to the NBMCA's core departments. This entails reporting on the management of related funds through the NBMCA's existing budget structure.

The **second** is to join representatives from the five additional municipalities of the North Bay - Mattawa Source Protection Area (who aren't currently included in the NBMCA's jurisdiction) to form the Source Protection Authority.



## Coordinating *The role of the NBMCA*

### THE LOCAL DRINKING WATER SOURCE PROTECTION TEAM

Conservation authorities had the watershed based expertise, but not always the capacity to take on an additional project the size and scope of drinking water source protection. To accomplish this, the Ministry of the Environment provided full funding for capacity building within Ontario's conservation authorities for the purposes of the drinking water source protection project. As a result, a specialised project team focused on coordinating the different elements and ensuring a transparent process was developed.



In the North Bay - Mattawa Source Protection Area, the team consists of the NBMCA's General Manager, the project manager and a variety of specialists and technicians in water resources, communications and GIS (geographic data management and mapping).

The core project team is supplemented by short term research analysts, support staff and summer students. Several science based consulting firms are also involved. Consultants are currently working on the technical studies required for each municipal drinking water system and conducting a preliminary assessment of threats for consideration of the Source Protection Committee.

# Overseeing *Source Protection Authorities*

## A NEW BOARD THAT OVERSEES THE COMMITTEE

While the NBMCA's Board of Directors is responsible for administering and meeting the objectives of the source protection planning memorandum of agreement with the Province of Ontario, a new board needed to be created to reflect all of the municipalities within the region.

The Clean Water Act called for a separate Source Protection Authority (SPA) in recognition that municipalities will be responsible for implementing the plan. To this effect, all municipalities should have the opportunity to be represented on the SPA. While they will not be responsible for approving the Source Protection Plan, they will have the opportunity to review it and provide comments before submitting it to the Minister of the Environment.

## DRINKING WATER SOURCE PROTECTION SCOPE EXPANDED BEYOND THE NBMCA'S JURISDICTIONAL BOUNDARIES

In many instances across the province, membership of the Source Protection Authority will be the same as the conservation authority's Board of Directors. In the North Bay - Mattawa region, however, this is not the case. As detailed on the map, the size of the North Bay - Mattawa Source Protection Area has been expanded beyond the NBMCA's jurisdictional boundaries to include South River's municipal water system and its contributing watersheds. Each of the five municipalities was invited to appoint a representative to join the NBMCA's Board of Directors on the SPA.



## RESPONSIBILITIES

The Source Protection Authority has the important role of reviewing and commenting on the key products of the Source Protection Committee, including the Terms of Reference, the Assessment Report, and the Source Protection Plan. It is the Source Protection Authority that posts the products for public comment, and submits the products to the Ministry for approval. Once the Source Protection Plan is approved by the Province, it is the Source Protection Authority's responsibility to ensure that it is made available to the public.

The Source Protection Authority also has the authority to amend the Source Protection Plan, with the Minister's approval. These amendments would either be initiated by the Source Protection Authority or based on Minister's direction. If the Source Protection Authority proposes an amendment, it must notify affected municipalities and seek their concurrence or comments on the amendments and share these with the Minister for her consideration.

Finally, the Source Protection Authority has the responsibility to keep the public and the government updated on implementation of the plan through interim and annual progress reports.

### PLANNING SUPPORT

Under the Clean Water Act, 2006 (CWA), the source protection committee will be responsible for developing three pieces of documentation that will complete the source protection planning process: (1) a terms of reference, (2) an assessment report, and (3) a source protection plan.

The committee will be guided by the Clean Water Act, its regulations, Director's rules (in respect of assessment reports), and guidance material created by the Ministry of the Environment, while working collaboratively with municipalities and source protection authorities.



### COMMITTEE REPRESENTATION

Source protection planning is designed to be a multi-stakeholder, collaborative process. To ensure representation from a variety of groups, the committee will consist of one-third municipalities (self selected), one-third sectorial (agriculture, industry, commerce, etc...) and one-third general public (including environmental organisations). In some cases, the various groups (such as municipalities) will self-select their representatives. In other areas, individuals can express their interest to the SPA. An additional seat is reserved for a First Nations' representative.

# Collaborating *Source Protection Committees*

### ROLE OF THE LOCAL SOURCE PROTECTION COMMITTEE

The Source Protection Committee is at the centre of the local planning process. The Source Protection Committee is responsible for preparing the terms of reference, the assessment report and the source protection plan for the area. The role of the committee is to guide the development of the plan and ensure that all of the relevant information is taken into account.

It is designated through regulation that the North Bay - Mattawa Source Protection Committee be made up of the Chair and nine representatives from watershed stakeholders (such as municipal, agriculture, landowners, industry, environmental non-government organizations) and members of the public at large. The Source Protection Committee will also work together with municipalities, the conservation authority, and provincial agencies.

### THE COMMITTEE CHAIR

Formation of the committee is one of the first responsibilities of the Source Protection Authority. The Clean Water Act provides that the Minister of the Environment will appoint the committee chair. Nominations for the chair, however, can come from the Source Protection Authority or municipalities. Individuals interested in applying for the position can submit their application package directly to the Source Protection Authority. It is proposed that the Source Protection Authority will forward the names of the top three candidates for the committee chair, along with the candidates' submission packages, to the Minister of the Environment for consideration.

After receiving the information from the source protection authority, the Minister will review the recommended candidates, taking into account why each nominee is interested in the position of chair as well as their qualifications. The Minister would then appoint the chair of the Source Protection Committee. The name of the appointed chair will be posted on the Public Appointment Secretariat website.

# Reporting

## *Source Protection Reports*

Several documents will be created during the development of the Source Protection Plan for the North Bay – Mattawa Source Protection Area.

### COMMITTEE TERMS OF REFERENCE (2008)

Once the Source Protection Committee is in place, its first task will be to develop its own terms of reference. The terms of reference will outline all the steps to be taken to develop and implement the Source Protection Plan. It will set out who is responsible for carrying out different activities. The document will also include strategies to consult with potentially affected property owners and other watershed residents.



### WATERSHED CHARACTERIZATION REPORT (2008)

When the members of the Source Protection Committee begin their work, they will have in front of them a Watershed Characterization Report for the North Bay – Mattawa Source Protection Area. The project team at the NBMCA has been working with municipalities and consultants to develop this report. The report will give committee members a full understanding of the current state of each sub-watershed by describing:

- population figures and projections
- physical characteristics
- land use
- water systems
- water sources
- water quality
- vulnerable areas

### ASSESSMENT REPORT (2009)

An Assessment Report will be developed for the five municipal systems included in the North Bay - Mattawa Source Protection Area. The report provides an analysis of water issues and will identify the vulnerable areas and threats to those municipal drinking water systems, including:

- quantity and quality of water
- water budget
- vulnerable areas such as groundwater recharge areas and highly vulnerable aquifers
- surface water intake protection zones
- wellhead protection areas
- existing issues
- significant drinking water threats

### SOURCE PROTECTION PLAN (2012)

The Source Protection Plan will build on the information contained in the earlier reports. The plan will outline:

- policies and programs to eliminate existing significant threats and to ensure that no more develop
- activities in wellhead and intake protection zones, including activities that are prohibited and activities that will be allowed with conditions (risk management plans)
- public education programs and programs to promote voluntary action regarding best practices

### ANNUAL REPORTS (Post 2012)

Following implementation, annual reports will track the objectives set out in the Source Protection Plan. They will be prepared by the Source Protection Authority (SPA), reviewed and commented on by the Source Protection Committee and then submitted to the MOE. The SPA must make the reports public.

In November 2005, the Ontario government announced it would provide a total of \$51 million over five years to municipalities under the Source Protection Technical Studies Grant Program.

With approval from the five municipalities, the North Bay - Mattawa Project Team secured \$262,700 for technical studies. The money is being used to study municipal wellheads and surface water intake areas for all five of the municipal drinking water systems. The work involves mapping the areas and evaluating the influences and threats to the wellhead and intake protection zones. This data will then be provided to the Source Protection Committee to assist with development of the Source Protection Plan.



#### FINANCING IMPLEMENTATION

Each municipality will be responsible for implementation of the plan within its boundary. The actual cost of implementing Source Protection Plans will depend on the findings of the technical studies and risk assessments for each watershed. For the most part, implementation will be handled through municipal land use policies, bylaws and other existing programs. The province recognizes that there may be hardship cases, and will address situations where costs are prohibitive on a case-by-case basis.

## Financing *the planning process*

#### PROVINCE FULLY FUNDING PLANNING

The Ontario government has committed to financing all the costs of developing Source Protection Plans under the Clean Water Act. It has put aside \$120 million to cover the period from 2004 to 2008. The work is not starting from scratch. Most municipalities in the North Bay - Mattawa Source Protection Area have already participated in a groundwater study and done other research. Conservation authorities have been monitoring water quality and quantity issues for years through the development of watershed management plans and all of that work is the foundation of the research now under way. The Ontario government has made money available to conservation authorities and municipalities to consolidate existing information, fill in the gaps and do new research where necessary. In addition, it is also providing money to pay the administrative and other costs of the source protection program and committee operations.

#### FUNDING FOR CONSERVATION AUTHORITIES

Beginning in November 2004, the province started making annual grants to conservation authorities to conduct research and gather information for source protection planning. This work involves water quality analysis, development of water budgets and other research. This funding also covers the cost of administering the source protection program in each source protection region.

The Ministry of the Environment's commitment:

- \$10.1 million in 2004-05
- \$16.8 million in 2005-06
- \$16.3 million in 2006-07

#### LOCAL FUNDING

The provincial share for the North Bay - Mattawa Source Protection Area to 2008: Approximately \$1.9 million

Funding availability for beyond 2008 has not yet been announced, respecting the provincial election in October 2007.

# Map



# Considering *the overall contributing area*



OFFICIAL NAME	AREA (KM <sup>2</sup> )	POP. (2006 CENSUS)	POP. DENSITY (PERSON /KM <sup>2</sup> )	SUB - WATERSHEDS	SINGLE TIER MUNICIPALITIES	UNORGANISED TOWNSHIPS	NBMCA MEMBERS
North Bay - Mattawa Source Protection Area	3,965	72,789-78,464	18-20	Amable du Fond River Bear-Boileau Creeks Boom Creek Duchesnay River Kaibuskong River La Vase River Mattawa River North River Pautois Creek Reserve-Beatty Creeks Sharpes River South River Upper South-Upper Amable du Fond Rivers Wistiwasing River ("Wasi" River)	Bonfield Callander Calvin Chisholm East Ferris Joly Machar Mattawa Mattawan Nipissing North Bay Papineau-Cameron Powassan South River Strong	Ballantyne Biggar Boulter Boyd Butler Commanda French Lauder Laurier Lister Merrick Mulock Olrig Osler Patterson Paxton Pentland Phelps Wilkes	Bonfield Callander Calvin Chisholm East Ferris Mattawa Mattawan North Bay Papineau-Cameron Powassan

Reference: Area, Population and Density = Statistics Canada. 2007. 2006 Community Profiles. 2006 Census. Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007. <http://www12.statcan.ca/english/census06/data/profiles/community/Index.cfm?Lang=E> (accessed May 4, 2007).



# Focusing on local systems

There are five municipal drinking water systems in the North Bay - Mattawa Source Protection Area. While the Source Protection Plan will consider the characteristics of the entire contributing area, the legislation requires that the primary focus be on the area surrounding the five municipal drinking water systems.

OFFICIAL NAME	AREA (KM <sup>2</sup> )	POP. (2006 CENSUS)	POP. DENSITY (PER/KM <sup>2</sup> )	SUB - WATERSHEDS	MUNICIPAL WATER SOURCE TYPE	MUNICIPAL WATER SOURCE	NBMCA MEMBER
Municipality of Callander	101	3,249	32	La Vase River Bear-Boileau Creeks Wasi River	Surface water	Lake Nipissing (Callander Bay)	Yes
Town of Mattawa	4	2,003	548	Mattawa River Amable du Fond River Pautois Creek Sharpes Creek Kaibuskong River North River	Ground water	Well	Yes
City of North Bay	315	53,966	171	Duchesnay River La Vase River Mattawa River North River	Surface water	Trout Lake (Delaney Bay)	Yes
Municipality of Powassan	223	3,309	15	Bear-Boileau Creeks Wasi River South River	Ground water	Well	Yes
Village of South River	4.04	1,069	265	South River	Surface water	South River (Forest Lake Reservoir)	No

# Protecting *municipal wellheads*

## ISSUES INVENTORY

In the North Bay - Mattawa Source Protection Area, two municipal systems use groundwater sources, specifically water treatment plants in Mattawa and Powassan. For the purposes of the source protection plan, computer models and other tools have been used to identify vulnerable areas, referred to as **wellhead protection areas (WHPA)**, where certain activities could threaten the municipal drinking water supply.

From that information, researchers built a picture of the groundwater conditions around each well. The diagram to the right illustrates how that information can be used to draw lines showing “time of travel” zones around the wellhead. “Time of travel” is the amount of time it would take a particle to reach the wellhead if the municipality was pumping water at its maximum permitted rate.

Some communities that rely on groundwater have already identified their immediate wellhead protection areas. Powassan has already placed some land use controls on what kind of activities are allowed closest to their wellhead. More research is being done to further define the wellhead protection area and identify any additional potential or significant threats.

### 100 metre zone

The area where the risk to the well is highest and the greatest care should be taken in handling of any potential contaminant.

### 2 year time of travel

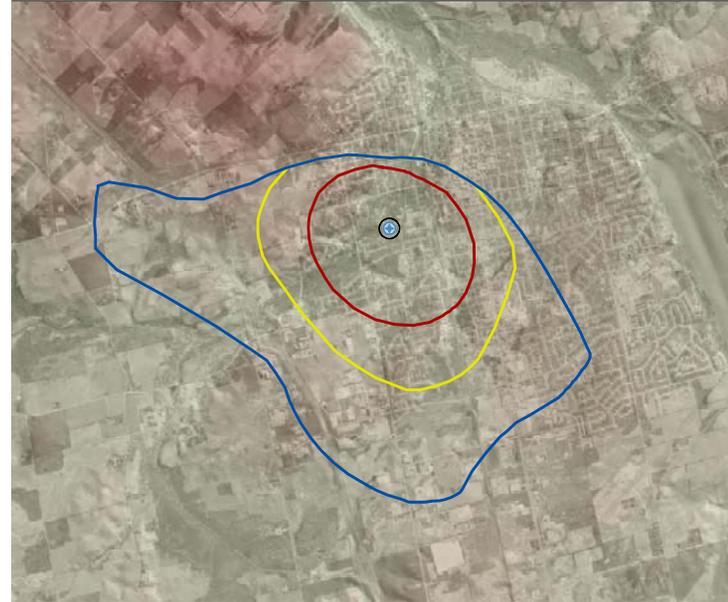
In the second ring, bacteria and viruses from human and animal waste are a concern, as are hazardous chemicals.

### 5 year time of travel

Biological contaminants 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.



This diagram shows the area around a well – the Wellhead Protection Area (WHPA). Groundwater moves slowly and the lines represent the number of years it would take for contaminated groundwater to reach the well.

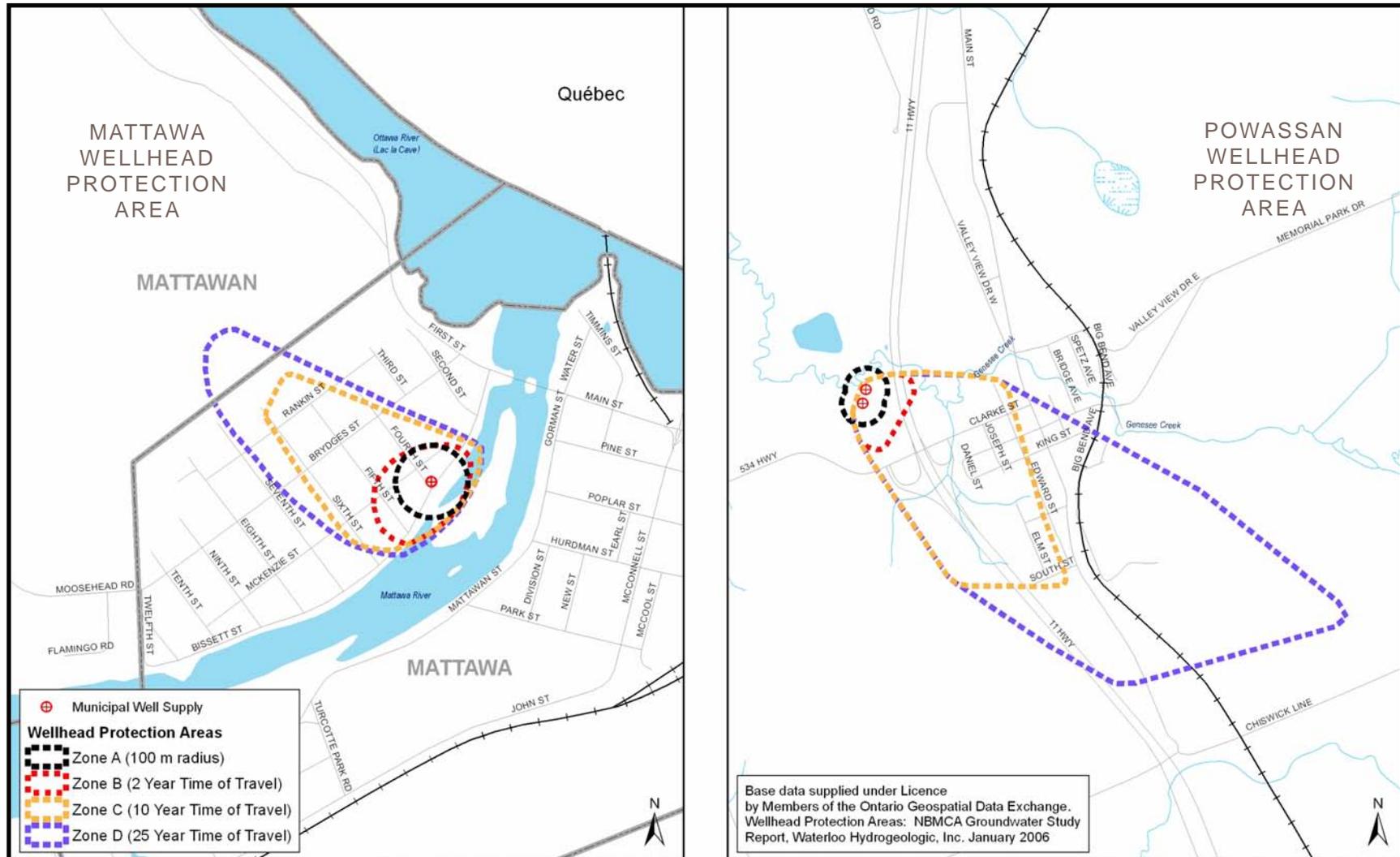
## WELLHEAD PROTECTION AREAS IN THE NORTH BAY - MATTAWA SOURCE PROTECTION AREA

There are two wellhead protection areas (WHPA) in the North Bay - Mattawa Source Protection Area. One is located in the **Town of Mattawa**, while the other serves the **Municipality of Powassan**. Preliminary groundwater studies were conducted on both wells in the early 2000s and served as the foundation for the expanded source protection technical studies.

# Mapping WHPAs

## *Draft Mattawa WHPA & Draft Powassan WHPA*

Please note that these maps are in draft format and will become official only upon approval of the Source Protection Committee in 2008. They are provided for illustrative purposes only and may change. For a larger map or more information, please contact the Drinking Water Source Protection project team at the NBMCA.



# Protecting *surface water intakes*

## ISSUES INVENTORY

Communities that rely on surface water, whether it comes from a river or a lake, can identify protection zones for their municipal intakes. A level 1 **Intake Protection Zone (IPZ)** is the area where a spill or leak may threaten the water supply so quickly that there may not be enough time to warn a community to shut down the water intake system.

The map on the right shows the Intake Protection Zones around the intake or pipe that supplies water to a community. The lines that surround the river show the area where contaminated water could reach the intake in less than two or three hours.

In the case of an intake on Trout Lake or in Callander Bay on Lake Nipissing, a minimum one-kilometre zone is established around the intake which, in some cases, may include shore areas. In addition, a second or third zone may be created that includes streams and rivers that can have an impact on the intake.

For the South River intake, the researchers have to take into account river flows – in both high and low flow conditions – since this can have a significant effect on time of travel. They have to look at streams feeding into the river. They also have to know where rural drains enter the river. The land surrounding the river, streams, and drains may become part of the overall intake protection zone. As a result, the zone may be determined differently.

### Zone 1 (IPZ-1)

A minimum 1 km or 200 meter zone surrounding the intake.

### Zone 2 (IPZ-2)

A minimum 2 hour travel time for contaminants to reach the intake, allowing enough time for the treatment plant to shut down.

### Zone 3 (TWCA)

The total water contributing area draining into the lake or river.



This diagram shows the area around a surface water intake – the Intake Protection Zone (IPZ). The lines that surround the river refer to the minimum amounts of time that it would take water and any pollutants in the water to reach the municipal system’s drinking water intake

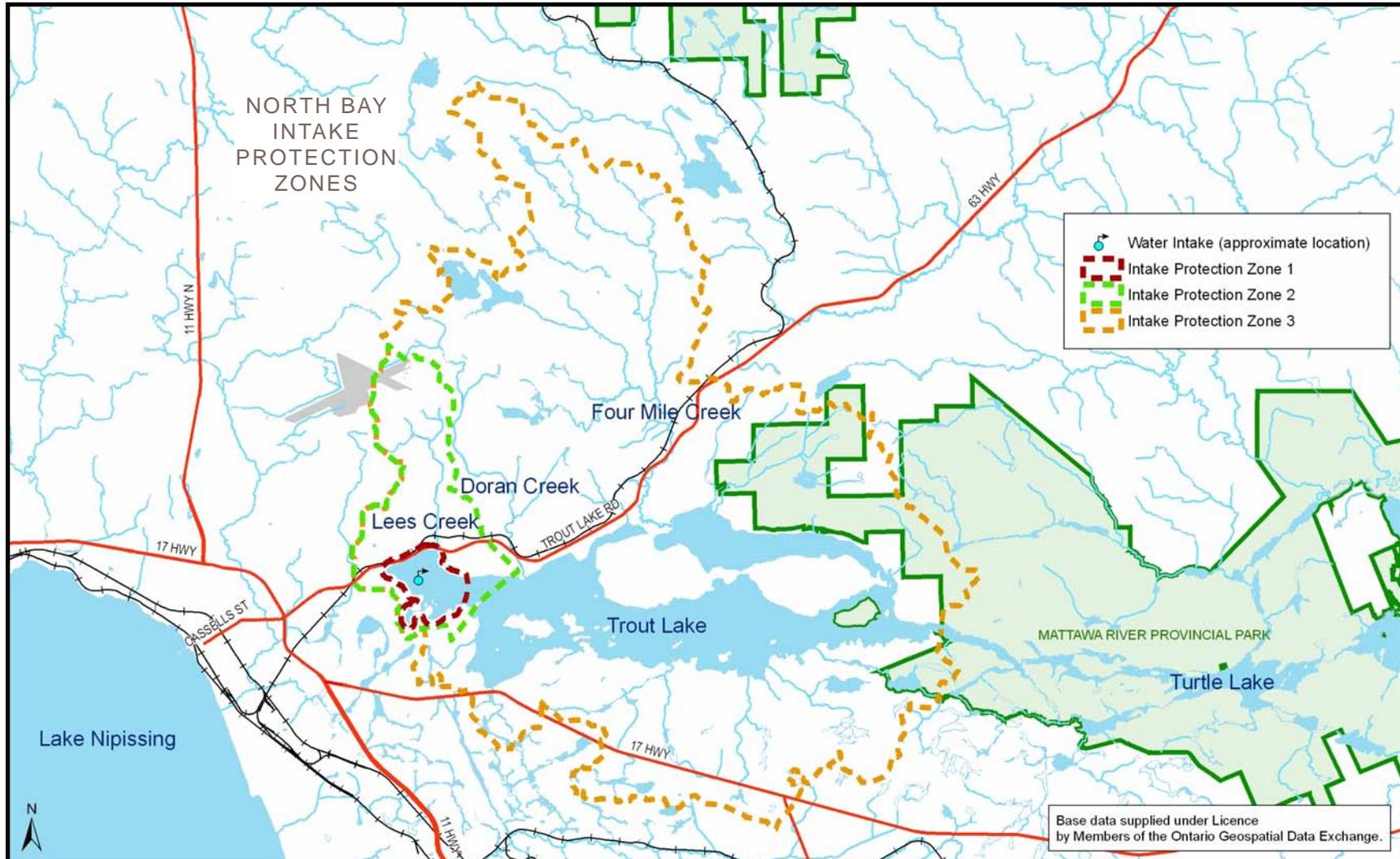
## INTAKE PROTECTION ZONES IN THE NORTH BAY - MATTAWA SOURCE PROTECTION AREA

There are three surface water intakes in the North Bay - Mattawa Source Protection Area. One is located in the **City of North Bay** on Trout Lake, while another intake serves the **Municipality of Callander** from Callander Bay on Lake Nipissing. The third, which serves the **Village of South River**, is located on a dammed river which has flow characteristics of both a river and a lake.

# Mapping IPZs

## *Draft City of North Bay IPZs*

Please note that this map is in draft format and will become official only upon approval of the Source Protection Committee in 2008. It is provided for illustrative purposes only and may change. For a larger map or more information, please contact the Drinking Water Source Protection project team at the NBMCA.



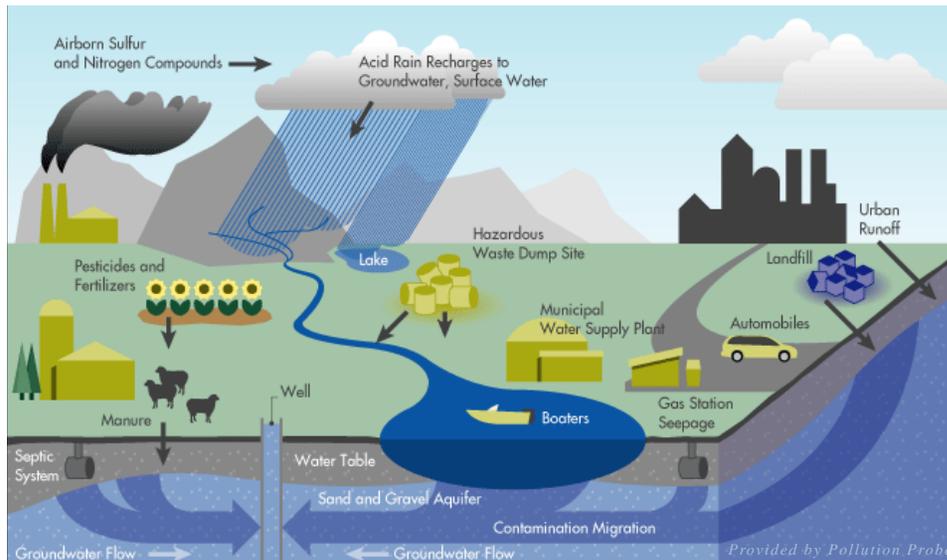
# Identifying *issues and threats*

## ISSUES INVENTORY

An important component of the source protection planning process is to identify existing water quality issues that may interfere with the current or future use of a municipal drinking water source. These issues often show up in the monitoring data collected at municipal wells and water intakes. In most cases, these issues are already known and steps may already be underway to deal with them.

The Source Protection Plan will identify steps necessary to deal with any outstanding issues. In cases where the issue poses a significant threat to municipal water supplies, the Clean Water Act allows action to be taken when the issue is identified, before the source protection plan has been completed.

In addition, it should be noted that the Ministry of the Environment has existing responsibilities and mechanisms to address issues in the environment.



## TREATS INVENTORY

Another important task is to identify and inventory issues that are considered threats to drinking water sources due to their proximity to vulnerable areas such as wellhead protection areas and intake protection zones. A variety of local, provincial and national information sources will be used to gather this data.

The illustration to the left shows examples of threats to water quality. Potential threats are many and varied. They are generally related to existing or past land-use activities and can occur in both urban and rural areas.

Some examples are:

- Spills and leaks from industrial or commercial operations.
- Transportation corridors that may be used to transport hazardous material. Transportation corridors run along several of the North Bay - Mattawa Source Protection Area's five municipal systems.
- Brownfield sites and abandoned factories
- Landfills, particularly abandoned sites
- Faulty septic systems, particularly where there are large numbers in a small area
- Fertilizers, pesticides and animal manure



#### ESTABLISHING THREATS & VULNERABILITY

The Ontario Ministry of the Environment is developing guidance documents that will be used in the source protection planning process to assess risks. For example, a particular chemical will be given a score (hazard rating) based on a number of factors: toxicity, persistence, quantity, etc. The higher the hazard rating, the greater the threat.

Similarly, vulnerability of the land will be given a rating based on soil type and the proximity to a wellhead or surface water intake. The closer to the vulnerable point or the faster the movement through the soil, the higher the rating.



## Calculating *the mathematics of risk*

Before a Source Protection Plan can be developed, it's important to identify the location and type of potential threats to water quality and supply. In an area as large and varied as the North Bay - Mattawa Source Protection Area, it is necessary to zero in on the most significant risks and deal with them. Two questions need to be answered to narrow the scope of the investigation:

- How vulnerable to contamination is the water source?
- How great is the threat?

Risk is a combination of vulnerability and threat. When both are high, then there is a high risk of contamination. If the land is vulnerable, but the threat level is low, then the risk level will be lower. If the threat level is high, but the land is not a vulnerable area (ie. outside of the identified zone), then the risk of contamination of drinking water will be lower.

#### CALCULATING RISK

**High vulnerability + high threat = high risk of contamination**

**Vulnerability:** Based on both geology and the lay-of-the-land. Vulnerable areas include the focus of the source protection plan - wellhead protection areas, surface water intakes, vulnerable aquifers and recharge areas for groundwater aquifers that serve municipal wells.

**Threat:** Based on human activity such as waste disposal, chemical use, and handling practices of hazardous materials.

In order for a threat to be categorized as a significant risk, it must be occurring within an identified vulnerable area. For instance, dry cleaning chemicals could pose a threat to drinking water, but only if they are present in a vulnerable area.

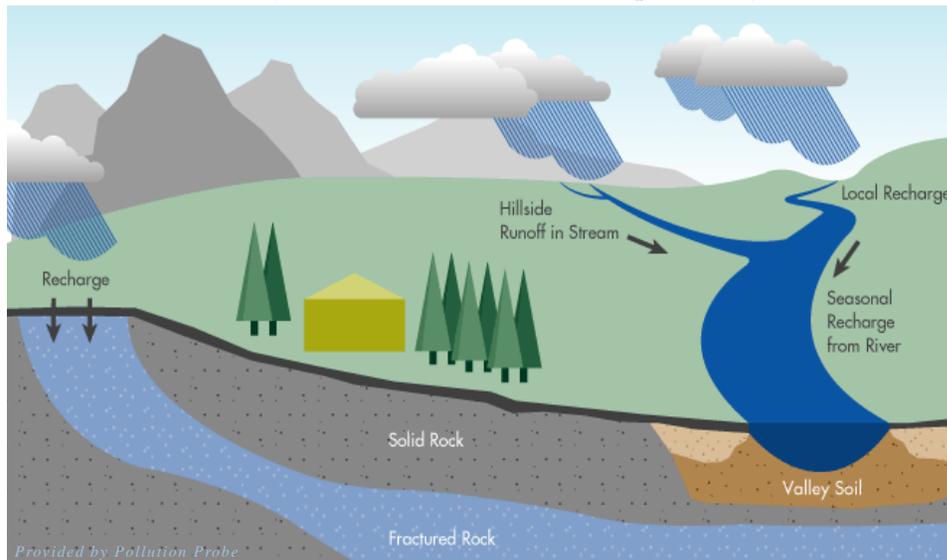
# Protecting *other vulnerable areas*

There are areas outside of municipal wellhead and intake zones which are also important to the water system and must be studied as part of the source protection planning process. Policies may be developed to ensure these areas and their functions are protected.

## HIGHLY VULNERABLE AQUIFERS

A highly vulnerable aquifer is one where there is a relatively fast path for contaminants from the surface to reach a groundwater aquifer. Typically these occur in regions of coarse or sandy soils or where the table is high. Aquifers are often sources of groundwater for both municipal and private wells. Aquifers can be extremely difficult to restore once they are contaminated and as such, aquifers surrounding municipal wells may be included in the source protection planning process.

The definition of a highly vulnerable aquifer is currently being refined so that they can be identified more precisely.



## SIGNIFICANT RECHARGE AREAS

Recharge areas are similar to highly vulnerable aquifers in that they are often areas of coarse or sandy soils. They are areas where a relatively high volume of water makes its way from the surface to the aquifer.

It is important to protect this recharge capacity because it has an effect on both the quality and the quantity of water. In many cases, water from these recharge area aquifers makes its way directly into streams and rivers. Thus, the recharge areas are important to both groundwater and surface water quality.



### WATER CONSUMPTION FACTS

In 1999, about 26% of Canadian municipalities with water distribution systems reported problems with water availability within the previous five years.

The average human needs approximately 5.7 litres of water per day for drinking and cooking. That's approximately the same amount of water used when a person in the industrialized world leaves a tap running for 20 to 40 seconds.

Based on the three rules of water conservation – reduce, repair and retrofit – a typical household can reduce water consumption by 40% or more, with little or no effect on lifestyle.

In 1999, water use was 70% higher when consumers faced flat rates rather than volume-based rates. And yet, only about 56% of Canada's urban population was metered in 1999.

It takes between 25 and 45 litres of water per day to cover a person's basic health and sanitation needs. It takes 70 litres of water to refine one litre of gasoline.

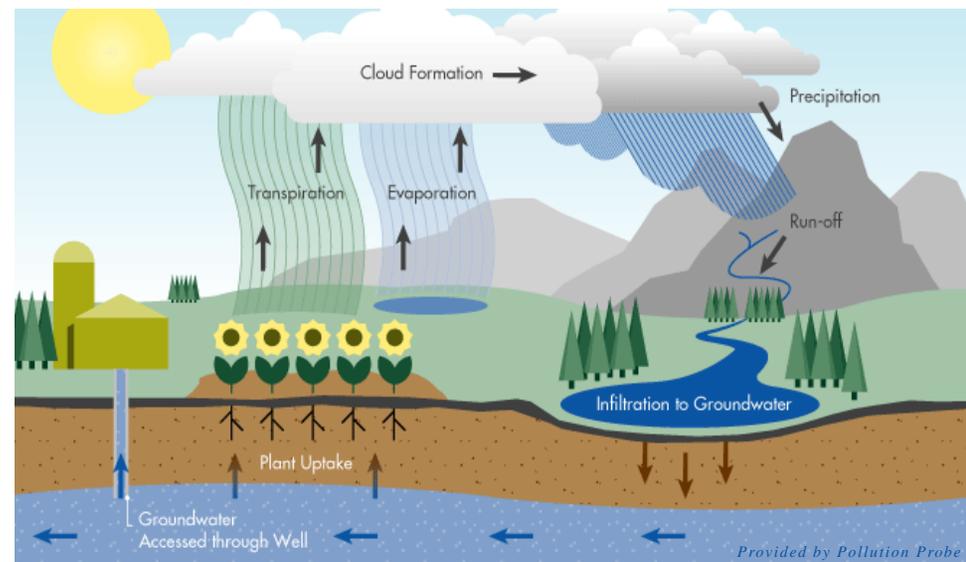
Source: Environment Canada, 2000

## Identifying *water supply issues*

### PROTECTING WATER QUANTITY

Source protection also means ensuring there is enough water available to meet current and future needs. We need to ensure that our water use is sustainable and that we are not over-allocating this resource. Protecting groundwater supplies can involve protecting the surface water features where water seeps into the ground to recharge aquifers that provide well water. Protecting surface water supplies, particularly rivers, may involve protecting surface features, such as wetlands, that keep the water clean and flowing.

In the North Bay - Mattawa Source Protection Area, municipalities draw their water from a variety of sources: aquifers, Trout Lake, Lake Nipissing and South River. Most of the five municipalities have already developed long-range water supply strategies. In some cases, these plans also involve water conservation programs.



# Communicating *public information*

## MULTIPLE CHANNELS

The source protection planning process is a public process. The residents of the North Bay - Mattawa Source Protection Area will be involved in many ways throughout the process.

### SP Committee and working groups

The Source Protection Committees will have 10 members, including the Chair. Some members will be appointed by municipalities. The others will represent a variety of groups including farmers, businesses, First Nations and others. Where needed, working groups will support the work of the committee.

### Consultation during the process

A consultation plan will be developed as part of the terms of reference of the Source Protection Committee with guidance from the Clean Water Act and regulations. It is anticipated that public meetings and open houses will be held at several stages of the process, as various documents and studies are completed, such as the Terms of Reference, the Assessment Report and the Source Protection Plans.

### Individual notification

Individuals who will be affected by a Source Protection Plan will be notified and given adequate time to provide comments on the proposed plan.

### Municipal consultation

Municipalities are key partners in the planning process because they are responsible for the quality of the drinking water supply. In general, the policies and programs in the Source Protection Plan will eventually be implemented through their official plans and zoning bylaws. The Clean Water Act requires consultation with municipalities during the development of the plan.

## ONLINE INFORMATION

The planning process will be open and transparent, therefore information about the process will be easily available on the Internet at:

[www.nbmca.on.ca](http://www.nbmca.on.ca).

The website will include copies of reports, meeting agendas and minutes and notices of public meetings and open houses. The website also carries copies of brochures, pamphlets and other information and background information.

**Source Water Protection**  
Produced by the North Bay - Mattawa Conservation Authority (NBMA)

ISSUE 1 | VOLUME 2 | WINTER '07

A BRIEF SUMMARY OF ONTARIO'S WATER RELATED LEGISLATION..... 2

INTERESTED IN AN SWP PRESENTATION FOR YOUR GROUP?..... 2

**Source Water protection**

PROVIDING A FLOW OF SOURCE WATER PROTECTION INFORMATION TO THE NEAR NORTH REGION.

Source Water Protection (SWP), a component of Ontario's Clean Water Act, will be the first step in a multi-barrier approach to the protection of municipal drinking water. The SWP plan will be locally developed by a Source Protection Committee and will include five municipalities in the North Bay - Mattawa SWP region: Callander, Mattawa, North Bay, Powassan & South River.

**Five municipalities, One Plan.**

The data gathering phase of the Source Water Protection (SWP) plan is continuing in earnest at the North Bay - Mattawa Conservation Authority (NBMA). Five applications for provincial technical study funding were submitted to the Ministry of the Environment by the NBMA on behalf of local municipalities. The proposed technical studies focus on the five municipal water systems of the North Bay - Mattawa SWP Region (see map of proposed SWP Region at right).

The information provided by the proposed technical studies will be incorporated into the Watershed Assessment Report. Once complete, this report will provide the scientific details required to develop an appropriate plan to protect drinking water sources. Completion of the assessment report and subsequent development of the local Source Water Protection plan will be directed by a group of local stakeholders. The Source Protection Committee is expected to be formed later this year.

**LEGISLATION UPDATE**

The Clean Water Act received Royal Assent (the Queen's approval) on October 19, 2006. Accompanying regulations are currently being drafted and will be posted for public comment on [www.ene.gov.on.ca](http://www.ene.gov.on.ca) as they become available. Comments and concerns can also be sent through the Source Water Protection staff at the North Bay - Mattawa Conservation Authority. The Clean Water Act, 2006 will not become law until the majority of regulations are approved and the legislation is proclaimed at Queen's Park (expected summer 2007).

**Minister of the Environment**



**Source Protection Authority**



**Source Protection Committee**



**Source Protection Project Team**

#### AVENUES OF APPEAL

Individual landowners will have several opportunities to provide input into the planning process and, if necessary, appeal actions contemplated under the Source Protection Plan.

Individuals can get information and provide input at open houses and public meetings.

Negatively affected property owners will be informed of the impact and will be able to seek a hearing through the Minister of the Environment on an aspect of the plan.

Property owners who are required to establish risk management plans to address significant risk may appeal measures in the plan to the Environmental Review Tribunal.

Implementation instruments, such as municipal bylaws, risk management plans or orders can all be appealed.

## Approving *the source protection plan*

#### PATHWAY TO IMPLEMENTATION

The illustration on the left shows the process of the plan from its technical foundation until approval. At the base are the technical studies which are conducted by the drinking water source protection project team at the conservation authority, municipal staff, consultants and other experts.

The work of the technical staff becomes the science-based foundation for the work done by the Source Protection Committee.

The committee's job is to guide the development of the plan, in conjunction with municipalities, property owners and others. The committee works with stakeholders to develop collaborative plans that accomplish the goals of protecting municipal drinking water quality and water quantity.

Once the plan is complete, it will be passed to the Source Protection Authority. The Source Protection Authority's responsibility is to make sure the plan meets the requirements of the Clean Water Act and then to submit it to the Ministry of the Environment. The Source Protection Authority has no power to change or reject the plan, but can attach formal comments.

Finally, it goes to the Ministry of the Environment for the minister's approval. The Minister may order public hearings, if necessary. Once the plan is approved, it goes forward to municipalities for implementation.



# Implementing *the source protection plan*

## USE OF EXISTING PROGRAMS

Generally, Source Protection Plans will be implemented by municipalities through existing regulatory requirements or approvals, zoning bylaws, official plan amendments, education and/or voluntary initiatives. Some of the tools already being used to protect water may become part of a Source Protection Plan, including:

- land use planning regulations (official plans, bylaws)
- sewage plant improvements
- water conservation programs
- pesticide use bylaws
- stormwater management systems
- Environmental Farm Plans & the Rural Water Quality Program
- spills response program

## RISK MANAGEMENT PLANS

There may be cases where existing tools may not be enough to address a specific significant threat to municipal drinking water supplies. If a scientific assessment shows that an activity poses a significant risk to a drinking water source, an approved Source Protection Plan may restrict or limit certain activities on properties located in designated wellhead protection areas and intake protection zones. Activities that pose a significant risk to drinking water sources may be prohibited or may require a risk management plan before they can be carried out.

The risk management measures would be negotiated between the property owner and a municipal risk management official. The risk management plan would detail the measures that a property owner will take to ensure the activity will not pose a significant threat to a drinking water source. The person would be required to carry out the activity in accordance with their risk management plan. A property owner will have the right to appeal the measures in the risk management plan to the Environmental Review Tribunal.

*“Where the potential exists for a significant direct threat to drinking water sources, municipal official plans and decisions must be consistent with the applicable source protection plan.*

*Otherwise, municipal official plans and decisions should have regard to the source protection plan. The plans should designate areas where consistency is required.”*

– Justice Dennis O’Connor

## FINANCING IMPLEMENTATION

The actual cost of implementing the North Bay – Mattawa Source Protection Plan will depend on the findings of the technical studies and risk assessments for each municipal drinking water source.

In most cases, implementation will be handled through municipal land use policies, bylaws and other existing programs. The province recognizes that there may be hardship cases, and will address situations where costs are prohibitive on a case-by-case basis.

## THE DRINKING WATER STEWARDSHIP FUND

The Clean Water Act introduced a new financial assistance program for farmers and small rural businesses for activities that reduce threats to drinking water. A panel that includes agricultural, municipal and conservation authority representatives will provide advice on how the drinking water stewardship program should be administered and the funds allocated. Initially, \$7 million is available in 2007-08 for early action to protect drinking water.

## Implementing *Who does what?*

When it comes time to implement Source Protection Plans, the world will still look much as it looks today, with various partners still doing what they do now.

### MUNICIPALITIES

Municipalities will oversee their own land use plans and growth strategies. They will still design and operate water and sewage plants. In most cases, municipalities will have the responsibility to negotiate site-specific risk management plans with landowners where they are necessary.

### NORTH BAY - MATTAWA CONSERVATION AUTHORITY (NBMCA)

Conservation authorities, including the NBMCA, will provide technical and planning advice to their municipal partners. They will protect sensitive environmental areas, such as wetlands, and will continue to promote conservation in the cities and best management practices on farms and in rural areas.

The Clean Water Act does not give conservation authorities any new powers.

### PROVINCE OF ONTARIO

The province will continue to issue Permits to Take Water and Certificates of Approval for water and wastewater plants. It will conduct research and set water quality standard. In addition, MOE is responsible for a variety of broader programs designed to safeguard the environment.

## Researching *additional info & resources*

### CONTACTS

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### WEB SITES

**North Bay - Mattawa Source Protection Area**  
[www.nbmca.on.ca](http://www.nbmca.on.ca)

Information about the planning process in this region, including studies, reports, committee agendas, minutes.

**North Bay – Mattawa Conservation Authority**  
[www.nbmca.on.ca](http://www.nbmca.on.ca)

A non-profit organisation, the NBMCA works closely with the public to ensure the environmental health of the region's watershed.

**Conservation Ontario**  
[www.conservation-ontario.on.ca](http://www.conservation-ontario.on.ca)

Conservation Ontario is the organization representing Ontario's 36 conservation authorities. The website contains background documents, brochures, graphics, videos and other material.

**The Clean Water Act – Ministry of Environment**  
[www.ene.gov.on.ca/envision/water/cwa.htm](http://www.ene.gov.on.ca/envision/water/cwa.htm)

The ministry's website contains the text of the Clean Water Act, brochures, technical documents and other information relating to the legislation and its implementation.

**The Environmental Registry**  
[www.ene.gov.on.ca/envision/env\\_reg/ebr/english](http://www.ene.gov.on.ca/envision/env_reg/ebr/english)

Part of the Ontario Environmental Bill of Rights where regulations, reports and other documents are posted for public comment.

