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1 Introduction

Clean drinking water is essential to human health and the economy. Ontario is the envy of jurisdictions around the world that face water shortages or polluted water sources. Ontario is fortunate to have an abundance of reliable sources of drinking water, from its thousands of lakes and rivers to vast underground aquifers.

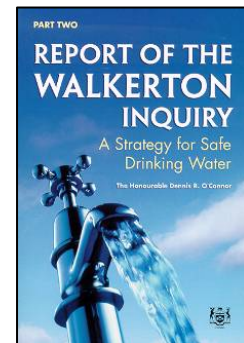
However, our water resources are by their very nature vulnerable to contamination and depletion. In the past there have been incidents, large and small, of drinking water contamination. The result is often illness and costly clean-ups. In some instances remediation may not even be possible. With the good fortune of having abundant, clean water resources, comes the responsibility to protect them. We must remain vigilant, now and in the future.

This chapter outlines how Ontario's *Clean Water Act* will protect existing and future sources of drinking water, starting with the development of this Assessment Report for the Mississippi-Rideau Source Protection Region (MRSPR).

1.1 Drinking Water Source Protection

The reality of what can happen to our sources of drinking water became all too apparent after the tragedy that occurred in Walkerton, Ontario in May 2000. A groundwater source of drinking water became contaminated and a treatment system failed, causing the death of seven people and ongoing illness in thousands.

The O'Connor Commission that looked into the tragedy made 121 recommendations to better protect Ontario's drinking water. The key conclusion was the need to have multiple layers of protection in place, called the "multi-barrier approach".



Multi-Barrier Approach

- Drinking water source protection
- Effective water treatment
- Secure distribution systems
- Monitoring & testing programs
- Response to adverse test results

Figure 1-i. The Multi-Barrier Approach

1.2 Ontario's Clean Water Act

In 2002, the Government of Ontario introduced the *Safe Drinking Water Act* to strengthen the rules and requirements around existing barriers (water treatment, distribution and testing). This and other measures fulfilled 99 of Justice O'Connor's recommendations. In 2006, the Government introduced the *Clean Water Act* to implement watershed-based source protection which adds a new barrier and fulfills the remaining 22 recommendations.

Purpose

The primary focus of the *Clean Water Act* is to ensure communities are able to protect their municipal drinking water supplies now and in the future from overuse and contamination. The Act requires municipalities, Conservation Authorities, First Nations, agriculture, business and industry, environmental groups, health units, government agencies and local residents to work together to:

- Identify threats to source water in Assessment Reports; and
- Develop policies to address them in Source Protection Plans.

Source Protection Plans will be written locally, approved by Ontario's Minister of the Environment (MOE) and implemented by municipalities, provincial Ministries and Conservation Authorities. The Plan will employ:

- Voluntary initiatives first;
- Negotiated solutions where possible; and
- Mandatory requirements when necessary.

Focus: Municipal Drinking Water

The *Clean Water Act* is not designed to protect all water resources. It is focused on protecting select areas where water resources are supplying municipal residential drinking water systems (the larger municipal systems that serve towns, villages and cities). These systems must be studied in Assessment Reports and protected through Source Protection Plans. The Mississippi-Rideau Source Protection Region has 12 municipal systems and one planned system.

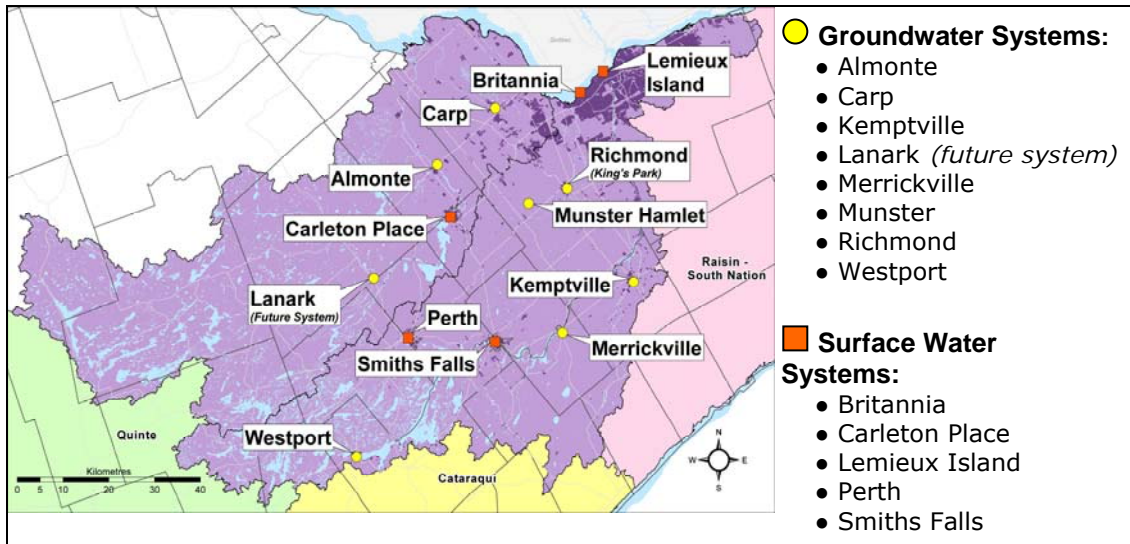


Figure 1-ii. Municipal Drinking Water Systems in the MRSPR.

Future: Protecting Other Systems

The Act allows municipal councils or the Minister of the Environment to include two other types of drinking water systems in the source protection planning process:

- Clusters of six or more private wells or intakes; and
- Systems that supply public and private facilities (schools, community centres, trailer parks).

There are many potential clusters in the Mississippi-Rideau region and over 600 public and private facilities. Currently, neither the Minister nor local municipalities have chosen to include any other systems in this current round of planning for the Mississippi-Rideau region.

Beyond the Act: Protecting Water Resources

The protection of municipal drinking water supplies is one piece of a broader environmental protection framework in Ontario. Water resources in Ontario are protected through the federal and provincial governments, municipalities, Conservation Authorities, and public health units. In part, these agencies are responsible for protecting and improving water quality, water quantity and aquatic habitats, providing land use planning and development rules to ensure that water resources are not negatively affected, providing floodplain management and responses to low water availability, and many others.

While there will undoubtedly be benefits to water quality beyond drinking water through the source protection process, it is important to keep the focus of the *Clean Water Act* on drinking water. The *Ontario Water Resources Act*, the *Environmental Protection Act* and other provincial and federal laws (such as the *Planning Act* and *Fisheries Act*) remain the chief vehicles for protecting Ontario's water resources. For more information on how water resources are protected in Ontario visit www.ene.gov.on.ca or call 1-800-565-4923.

The Act and its Regulations

The *Clean Water Act* and its four regulations were written by the MOE. They were developed after public consultation with key stakeholders and the general public, including being posted on the Environmental Registry for review and comment. The following legislation can be viewed at www.e-laws.gov.on.ca:

- *Clean Water Act*, 2006
 - Ontario Regulation 287/07 – General
 - Ontario Regulation 231/07 – Service of Documents
 - Ontario Regulation 284/07 – Source Protection Areas and Regions
 - Ontario Regulation 288/07 – Source Protection Committees.

1.3 The Source Protection Planning Process

The MOE is the lead agency for drinking water source protection activities across Ontario. This Ministry developed a source protection planning process through the *Clean Water Act* and its regulations that culminates in the creation of a Source Protection Plan by 2012.

	2005	2006	2007	2008	2009	2010	2011	2012	
Technical Studies		■							
Terms of Reference				■					
Assessment Report					■				
Source Protection Plan						■			

Table 1-i. The Source Protection Planning Process.

The Watershed Scale

The *Clean Water Act* divided most of the settled parts of Ontario into watershed-based Source Protection Areas. Most of these areas mirror Conservation Authority boundaries with a few including adjacent lands and waters. A total of 38 Source Protection Areas were created which the *Clean Water Act* then grouped into 19 Source Protection Areas and Regions. Regions were created so source protection staff and resources could be shared, therefore reducing costs.

Source Protection Areas and Regions

Eastern Ontario was divided into four source protection areas/regions as shown in the following map:

- Cataraqui Source Protection Area (yellow);
- Quinte Source Protection Region (green);
- Mississippi-Rideau Source Protection Region (purple); and
- Raisin-South Nation Source Protection Region (pink).

The MRSPP is made up of:

- The Mississippi Valley Source Protection Area – the jurisdiction of Mississippi Valley Conservation; and

- The Rideau Valley Source Protection Area – the jurisdiction of Rideau Valley Conservation Authority.

A description of the Mississippi-Rideau Source Protection Region is provided in Chapter 2.

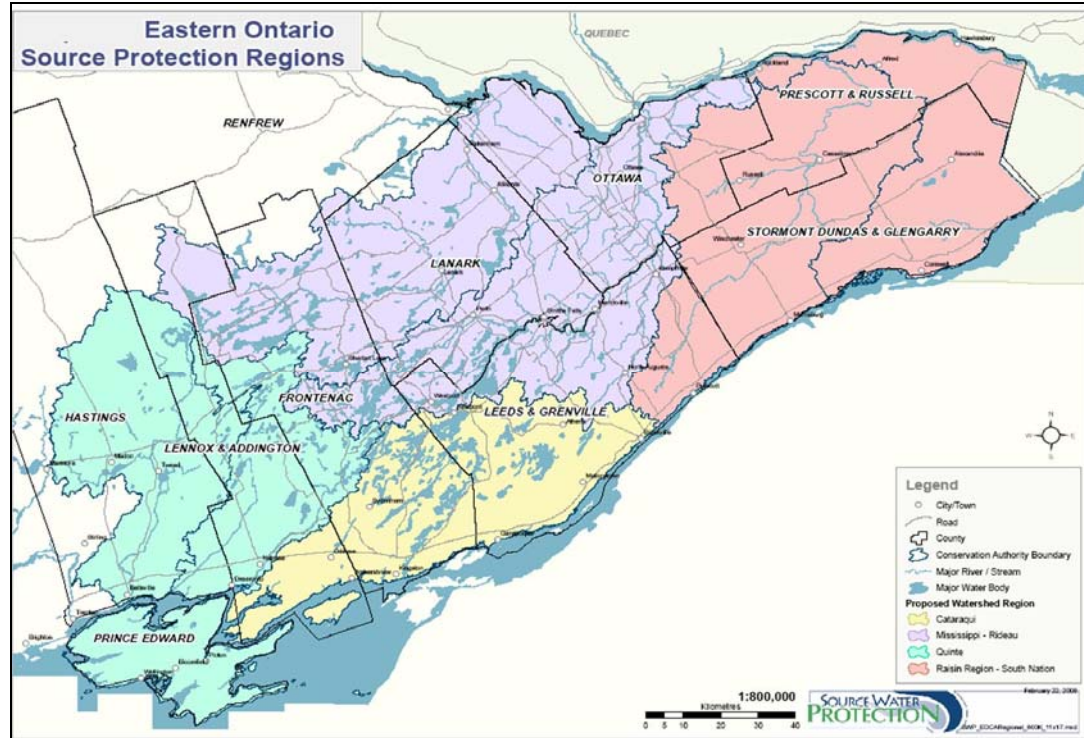


Figure 1-iii. Eastern Ontario Source Protection Areas and Regions.

Source Protection Authorities

Conservation Authorities across Ontario are serving as Source Protection Authorities under the *Clean Water Act*. Their role is to administer the source protection planning budget, establish a local Source Protection Committee in each region and submit proposed deliverables completed by the Committee to the MOE for review and approval.

The Mississippi Valley Source Protection Authority (made up of the 15-member Board of Directors for Mississippi Valley Conservation) and the Rideau Valley Source Protection Authority (made up of the 12-member Board of Directors for the Rideau Valley Conservation Authority) jointly administer the source protection program in the Mississippi-Rideau region.

Building Conservation Authority Capacity – 2005

In 2005, the MOE and MNR began funding Conservation Authorities in advance of the *Clean Water Act* to:

- initiate some of the background technical studies required for the Assessment Report; and
- begin communications and public engagement activities to raise general awareness and knowledge about impending source protection legislation.

Source Protection Committees - 2007

In 2007, the Minister of the Environment appointed Janet Stavinga to Chair the Mississippi-Rideau Source Protection Committee. The Mississippi Valley and Rideau Valley Source Protection Authorities then appointed 15 Committee members. As per the *Clean Water Act*:

- 1/3 represented municipal interests;
- 1/3 represented economic interests; and
- 1/3 represented community interests.

The Committee is also joined at each meeting by three non-voting liaison members from the MOE, public health units, and the Source Protection Authorities. Biographies for each Committee member are included in Appendix 1-1; a list of Committee members follows.

Member	Sector	Representing
Janet Stavinga	Chair	
Scott Bryce	Municipal	Municipalities with groundwater-based municipal drinking water systems
Paul Knowles	Municipal	Municipalities with surface water-based municipal drinking water systems
Eleanor Renaud	Municipal	Municipalities with no municipal drinking water systems
Christine Leadman	Municipal	City of Ottawa
Tammy Rose	Municipal	City of Ottawa
Richard Fraser	Economic	Agriculture
Peter McLaren	Economic	Agriculture
Scott Berquist	Economic	Industry/Commercial
Drew Lampman	Economic	Industry/Commercial
Beverly Millar	Economic	Small Business
George Braithwaite	Community	Rural General Public
Carol Dillon	Community	Environmental Non-Governmental Organizations
Patricia Larkin	Community	Non-Governmental Organizations
Randy Malcolm	Community	Algonquins of Ontario
Recently Vacant	Community	Public Interest
Mary Wooding	Liaison	Ministry of the Environment
Alan Arbuckle, Mark Burnham, Ken Graham, Phil Sweetnam (rotational basis)	Liaison	Source Protection Authorities
Jean-Guy Albert	Liaison	Public Health Units

Table 1-ii. Mississippi-Rideau Source Protection Committee Members.

The *Clean Water Act* requires each Source Protection Committee to develop three key documents: Terms of Reference, Assessment Report and Source Protection Plan.

Terms of Reference - 2008

The Terms of Reference were written for the Mississippi Valley Source Protection Area in 2008 and approved by the Minister of the Environment in early 2009. Terms of Reference identify what needs to be done to complete Assessment Reports and Source Protection Plans and who is responsible for each task.

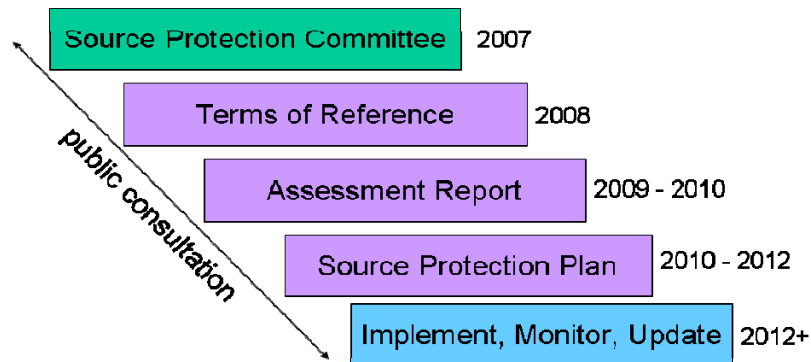


Figure 1-iv. The Source Protection Process.

Assessment Report – 2009/2010

Information on vulnerable areas and potential drinking water threats is being collected in Assessment Reports. This document is the Assessment Report for the Mississippi Valley Source Protection Area. A separate Assessment Report has been prepared for the Rideau Valley Source Protection Area. Assessment Report findings will be the basis for Source Protection Plan policies.

Source Protection Plan – 2010/2012

Source Protection Plans will be prepared by the summer of 2012. Plan policies must ensure significant drinking water threats cease to be significant and no low or moderate threats become significant. The plan must also include requirements for monitoring local progress on source protection. The plan will include policies that make use of implementation tools such as public education, incentives, municipal land use planning and by-laws, infrastructure, and provincial approvals and permits. Municipalities are expected to be involved in implementing source protection plans, in part through updates to their official plans and zoning by-laws. Conservation Authorities and provincial ministries will also play a role in implementation.

Implement, Monitor and Update – 2012+

Once the Minister has approved Source Protection Plans the policies will be implemented by municipalities, Conservation Authorities, and the Province. There is a requirement to monitor progress and report on it and the Minister will set a review date upon which the Committee will revisit their Terms of Reference, Assessment Reports and Source Protection Plans to amend and update them where required.

The source protection planning process is intended to continue over the long term.

Provincial Funding

The Provincial Government is funding 100% of the source protection planning process into 2012 when Source Protection Plans will be completed. This includes the cost of technical studies, consultants, peer review, source protection staff and the Source Protection Committee. It should be noted that many municipalities have also generously contributed staff time in support of local source protection planning work.

Implementation costs will depend on the types of policies that will be used in the Source Protection Plan to address drinking water threats. A funding model identifying who will pay for implementation has not been completed.

1.4 Participants in the Process

Source Protection Committees are responsible for developing Terms of Reference, Assessment Reports and Source Protection Plans. Source Protection Authorities are responsible for submitting these documents to the MOE for review and approval. Many groups and individuals provide valuable input into the source protection process which the Committee reviews and considers when developing their documents and the MOE considers when developing new regulations and rules.

Everyone has an interest in drinking water source protection, from wanting to ensure their source of drinking water is protected to having input into source protection policies that may affect their property. This is why source protection in Ontario is being led locally at the watershed scale. It is also the reason the MRSPR is committed to ensuring effective municipal and public participation and developing source protection policies in an open and consultative manner.

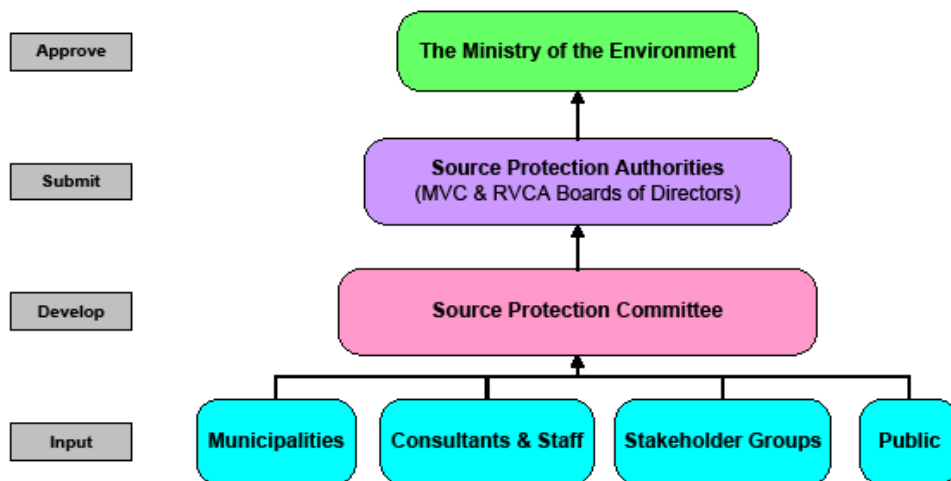


Figure 1-v. Participants in the Development of the Source Protection Planning Process.

1.4.1 Municipalities

Municipalities are key partners in source protection planning:

- They own and/or operate the municipal residential drinking water systems;
- They can choose to lead technical studies and/or develop the source protection policies required for their municipality;
- Their councils can include “other” drinking water systems in the source protection process;
- They could be responsible for implementing parts of source protection plans once they are approved; and
- Source Protection Plans could trigger changes to municipal Official Plans and/or Zoning By-laws.

Local municipalities have been very involved in the source protection process in the Mississippi-Rideau Source Protection Region. Since 2005 they have worked closely with source protection staff on data collection, technical studies and communications. Most notably, many municipal staff have participated on one or more of our technical working groups which oversaw the technical studies that fed into the Assessment Report. Municipalities will play a large role on our upcoming planning working group which will draft preliminary Source Protection Plan policies for Committee consideration.

All or a portion of 31 municipalities fall within the Mississippi-Rideau Source Protection Region (seven counties and 24 lower and single tier municipalities).

Upper Tier Municipalities (Counties)	Lower and Single Tier Municipalities
Frontenac, County of	Central Frontenac Township
	North Frontenac Township
	South Frontenac, Township of
Lanark County	Beckwith Township Carleton Place, Town of Drummond/North Elmsley, Township of Lanark Highlands, Township of Mississippi Mills, Town of Montague, Township of Perth, Town of Tay Valley Township
Leeds & Grenville, United Counties of	Athens, Township of Augusta, Township of Elizabethtown - Kitley, Township of Merrickville - Wolford, Village of North Grenville, Municipality of Rideau Lakes, Township of Westport, Village of
Lennox & Addington, County of	Addington Highlands, Township of
	Ottawa, City of
Prescott & Russell, United Counties of	Clarence - Rockland, City of
	Smiths Falls, Town of
Stormont, Dundas & Glengarry, United Counties of	North Dundas, Township of
Renfrew, County of	Greater Madawaska, Township of

Table 1-iii. Municipalities in the Mississippi-Rideau Source Protection Region Source Protection Planning Process.

1.4.2 Provincial Government

There are a number of provincial agencies which have been involved with or will play an increasing role in source protection. They include:

- Ontario Ministry of the Environment;
- Ontario Ministry of Natural Resources;
- Ontario Ministry of Municipal Affairs and Housing;
- Ontario Ministry of Agriculture, Food and Rural Affairs;
- Public Health Units; and
- Stewardship Councils.

These agencies are important partners because they share their knowledge, while some assist with landowner contact and the delivery of programs to landowners.

1.4.3 Federal Government

The federal government has many interests in the Mississippi-Rideau Source Protection Region, including that of landowner. Parks Canada and the National Capital Commission are federal organizations that have been or will be involved in the source protection planning process.

1.4.4 Algonquins of Ontario

Algonquins of Ontario are important partners as they have a long-standing interest in protecting water resources, a wealth of traditional knowledge about local water resources, and a land claim over much of the Mississippi-Rideau region.

1.4.5 Adjacent Source Protection Regions

The Mississippi-Rideau Source Protection Committee coordinates their efforts with their three neighbouring source protection areas and regions (Cataraqui, Quinte and Raisin-South Nation). This builds on a long tradition of cooperation between the Conservation Authorities. The intent is to provide consistent information wherever possible for the benefit of those municipalities that fall into more than one source protection region.

1.4.6 Interested Groups, Stakeholders and the Public

There are many individuals and groups in the Mississippi-Rideau Source Protection Region who are interested in source protection and engaged in the process. In particular, the agricultural community, lake associations, aggregate and golf course industries, community and landowner associations and environmental groups have shown interest in the process and invited staff to speak to their members. Many of these economic and community interests are represented by members on the Source Protection Committee which ensures a broad range of views and perspectives are at the table when decisions are being made.

1.4.7 Ottawa River Watershed

The largest municipal drinking water system in the Mississippi-Rideau Source Protection Region is in the City of Ottawa. The Britannia Water Purification Plant and the Lemieux Island Water Purification Plant are located along the Ottawa River in the urban area of Ottawa and together they provide drinking water for approximately 814,000 people. Understandably, the overall health of the Ottawa River has been an issue of concern to the Mississippi-Rideau Source Protection Committee since they convened in 2008.

The Ottawa River basin encompasses an area of approximately 146,300 square kilometres with countless rivers, lakes, streams and drainage areas. The Mississippi-Rideau Source Protection Region makes up a mere 6% of this total area. The Mississippi-Rideau Region is working closely with Ville de Gatineau staff and City of Ottawa staff to share information to better protect the municipal drinking water system intakes on the Ottawa River. However, the

larger issue at play is the overall water quality, water quantity, and ecological integrity of the interprovincial Ottawa River.

Protecting the Ottawa River watershed is beyond the capacity and scope of the Mississippi-Rideau Source Protection Region or its Source Protection Authorities. Initiatives are underway within the Ottawa River watershed to establish better information sharing and collaborative decision making among watershed agencies and stakeholders to protect the broader water quality, quantity, and the ecological integrity of the Ottawa River.

1.5 Scope and Purpose of the Assessment Report

1.5.1 Scope of the Report

The scope of this Assessment Report is defined by the Terms of Reference developed by the Mississippi-Rideau Source Protection Committee. Its focus is on the 12 existing local municipal residential drinking water systems and one planned system. Future versions of the Assessment Report may include technical findings related to other public drinking water systems and/or clusters of private intakes or wells. These systems can only be included if added to the Terms of Reference through a municipal council resolution, or at the direction of the Ontario Minister of the Environment.

1.5.2 Purpose of the Report

The main purpose of the Assessment Report is to identify drinking water issues and threats within the vulnerable areas that are described in Chapters 5 and 6. This information will assist the community, led by the Mississippi-Rideau Source Protection Committee, to prepare the Source Protection Plan. Significant drinking water threats will be the main focus of discussion during the development of the Plan.

The report also serves as a summary of technical findings. For more detailed findings about a specific topic or location, please refer to the individual technical reports, each of which is listed in Appendix A-1. They are available on CD at Mississippi Valley and Rideau Valley Conservation Authorities' respective administrative offices (Lanark and Manotick).

The report provides a list of topics that may benefit from additional research in the future. It also discusses data gaps which were identified during the development of the many supporting technical studies. Chapter 8 identifies data gaps and knowledge limitations.

The *Clean Water Act* established minimum objectives for Assessment Reports. The following chart lists these objectives and where they are addressed in this report.

Provincial Assessment Report Objectives		Addressed in Chapter:
1	Identify all the watersheds and subwatersheds in the source protection area	2
2	Characterize the quality and quantity of water in each watershed	2 & 3
3	Set out a water budget for each subwatershed, which describes how water enters and leaves the watershed and describes the groundwater and surface water flows in the watershed and how water is used	3
4	Identify all significant groundwater recharge areas and highly vulnerable <i>aquifers</i> that are in the source protection area	5
5	Identify all surface water intake protection zones and wellhead protection areas that are in the source protection area	5 & 6
6	Describe the drinking water issues relating to the quality and quantity of water in each of the vulnerable areas identified under clauses (d) and (e) of the <i>CWA</i>	5 & 6
7	List <i>activities</i> that are or would be drinking water threats, and conditions that result from past <i>activities</i> and that are drinking water threats	4, 5 & 6
8	Identify the areas where an <i>activity</i> listed under clause (g) of the <i>CWA</i> is or would be a significant drinking water threat, and the areas where a condition listed under clause (g) is a significant drinking water threat	5 & 6
9	Review of available climate change information and how it will affect the Assessment Report conclusions	7

Table 1-iv. Location of MOE Objectives in Mississippi-Rideau Source Protection Region Assessment Report.

1.5.3 Layout of the Report

This Assessment Report contains detailed local information in support of each of the above objectives. The ensuing chapters provide the details on each of these topics as required by the legislation, regulations and rules:

- **Chapter 2** delineates the Mississippi Valley and Rideau Valley Source Protection Areas and provides an overview of the watersheds, the physiography, human geography, and interactions of humans on the landscape;
- **Chapter 3** provides a Water Quantity Stress Assessment which is based on a synopsis of the Conceptual and Tier 1 Water Budget Reports;
- **Chapter 4** provides an overview of the approach used to evaluate drinking water threats and issues;
- **Chapter 5** focuses on groundwater. It defines groundwater sources of drinking water in the region, vulnerable areas, and high risk activities, issues and conditions which could contribute to groundwater contamination;

- **Chapter 6** focuses on surface water. It defines surface water sources of drinking water in the region, vulnerable areas, and high risk activities, issues and conditions which could contribute to surface water contamination;
- **Chapter 7** provides local information on Climate Change;
- **Chapter 8** identifies data gaps and future research needs; and
- **Chapter 9** is a summary of key findings that should be taken under consideration when formulating the source protection plan.

1.6 Methods of Technical Work

The source protection program in Ontario is intended to be based on the best available science. The scientific methods used to carry out the technical work are laid out in Ontario Regulation 287/07 General, the *Technical Rules: Assessment Report* document, and related guidance materials. These documents were developed by the provincial government in consultation with scientists from various fields and representatives from stakeholder groups such as agriculture and industry. Similar methods are being used across Ontario, so that there is a reasonable degree of consistency. These documents are available on the MOE web site at:
<http://www.ene.gov.on.ca/en/water/cleanwater/index.php>.

This Assessment Report includes findings from a large number of technical studies, all of which are listed in Appendix A-1. The studies were completed under the supervision of technical working groups made up of source water staff, municipal staff, and others. In addition, all of the studies were completed in accordance with the *Clean Water Act*, its Regulations and the Technical Rules and most have been subject to peer review by a qualified neutral third party. Additional information about specific technical methods is presented in many of the chapters.

Study findings were carefully reviewed by Conservation Authority staff and the Source Protection Committee. The Committee hosted 11 municipal and public open houses to share the preliminary findings with the community and seek feedback and local knowledge. The Committee then reviewed all public comments before deciding to approve or challenge study findings for inclusion in this document.

1.7 Continuous Improvement

This report has been prepared using the best data and knowledge available at the time the technical studies were completed, and where possible, at the time of publication. Data gaps and knowledge limitations are identified and described in Chapter 8. The Assessment Reports will be updated and amended as new data and knowledge becomes available.

We encourage readers to contact staff at the Mississippi Valley or Rideau Valley Conservation Authorities to check for updated information when conducting research about a specific topic or location.