

Chapter 1 – Introduction

“Water is the most critical resource issue of our lifetime and our children's lifetime. The health of our waters is the principal measure of how we live on the land” – Luna Leopold

1.1 Drinking Water Source Protection and the Ontario Clean Water Act, 2006

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, ultimately causing the death of seven people and illness in thousands.

The O’Connor Commission that looked into the tragedy recommended, as part of a multi-barrier approach, that sources of *drinking water* should be protected from *contamination* and overuse. The Ontario government responded by funding an intensive drinking water source protection initiative and by passing the Clean Water Act, 2006. The *Act* lays out the steps required to develop locally driven, science-based *assessment reports* and *source protection plans*. While the primary focus of the work to-date has been the *source water* for cities and towns, the *Act* also provides for future work to consider other types of *drinking water systems*, and the use of the Great Lakes as a source of *drinking water*.

The expected outcome of these efforts is the development of comprehensive plans that will identify what needs to be done locally to protect sources of *drinking water*. The plans will provide tools to make sure that *threats* to *drinking water* sources are reduced or eliminated. This *Assessment Report* is intended to provide much of the scientific basis for the forthcoming source protection plan for the Cataraqui area.

1.2 The Source Protection Planning Process

The source protection planning process is intended to continue over the long-term, similar to land use planning efforts by the provincial government and municipalities under the Ontario Planning Act. Source protection is one component of *watershed* management, which involves the following repeating steps: scientific research, planning, *monitoring* and the evaluation of success. This *Assessment Report* is the culmination of five years of scientific research.

The Ontario Ministry of the Environment (MOE) is the lead agency for drinking water source protection *activities* across the province. The Ontario Ministry of the Natural Resources is assisting with project management and aspects related to protecting quantities of water from overuse.

Most of the settled parts of Ontario have been divided into *watershed*-based source protection areas and regions. The south-eastern part of the province includes eight source protection areas, each based on a conservation authority jurisdiction and adjacent lands and waters (see **Map 1-1**). Most of the source protection areas have been joined together with another source protection area to form a source protection region. Locally, the Cataraqui Source Protection Area (CSPA) has

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been defined to include the jurisdiction of the Cataraqui Region Conservation Authority (CRCA) plus the Township of Frontenac Islands and other lands and waters in Lake Ontario and the St. Lawrence River (see **Map 1-2**). Owing to its size, breadth and internal diversity, the CSPA is not joined with other source protection areas. A description of the CSPA is included in Chapter 2 of this report.

Conservation authorities across Ontario are serving as source protection authorities to coordinate the local work. The Cataraqui Source Protection Authority (the SP Authority) includes the 17-*member* board of the CRCA and a representative of the Township of Frontenac Islands. The SP Authority managed the technical studies that are summarized in this report, and in 2007 it formed the Cataraqui Source Protection Committee (the SP Committee) to oversee the work.

The provincially-appointed *Chair* of the SP Committee is Mr. John C. Williamson of Inverary; Mr. Williamson is a wildlife biologist, a facilitator and an active farmer. The membership of each SP Committee is divided into three groups:

1. municipal
2. economic
3. community.

The 16-*member* Cataraqui SP Committee includes municipal representatives from the eastern, central and western parts of the CSPA, economic representatives from agriculture, industry and tourism and recreation, and community representatives from environmental groups, lake associations, and the public. Biographies for each of the current *members* are included in **Appendix 'A'**. The Committee is joined at each meeting by non-voting *liaison members* from the MOE, public health units, and the SP Authority.

The SP Committee is required to complete three tasks, as outlined in the Ontario Clean Water Act, 2006:

- Write terms of reference to identify what work needs to be done and who is responsible to complete that work.
- Compile an *assessment report* that brings together the science and technical information required to develop a *source protection plan*.
- Produce a *source protection plan* that will outline measures necessary to reduce or eliminate the *threats* identified in the *Assessment Report*.

Terms of Reference for source protection *activities* in the Cataraqui area were written in 2008 and approved by the Minister of the Environment in May 2009 (Cataraqui Source Protection Committee, 2009).

The *source protection plans* will be prepared by the summer of 2012. They will include policies which make use of implementation tools such as public education, incentives, municipal land use planning and by-laws, infrastructure, and provincial approvals and permits. They will also include requirements for *monitoring* local progress on source protection. Municipalities are expected to be involved in implementing the *source protection plans*, in part through updates to their municipal official plans and zoning by-laws.

The SP Committee has and will continue to consult with municipalities, stakeholder groups and the public so that *assessment reports* and *source protection plans* are developed through an open and transparent process. Information related to the work has been shared at public open houses and municipal council meetings, and it is posted on the Internet at www.cleanwatercataraqui.ca.

1.3 Participants in the Process

Everyone has an interest in drinking water source protection – as individuals, we rely upon water for our life at home and work. The future of our communities depends on access to clean and plentiful water. For these reasons, source protection in Ontario is being led locally, with source protection committees established on a *watershed* basis. There have been and will continue to be many different participants in the process. Our stakeholders and partners include municipalities, federal and provincial government agencies, community groups, businesses, residents, and visitors.

1.3.1 Municipalities

All or part of three counties and 12 municipalities fall within the Cataraqui Source Protection Area (CSPA). These include large urban and small rural municipalities. The counties are Lennox and Addington, Frontenac, and Leeds and Grenville. The municipalities, from west to east, are:

- Town of Greater Napanee
- Loyalist Township
- Township of South Frontenac
- City of Kingston
- Township of Frontenac Islands
- Township of Rideau Lakes
- Township of Leeds and Thousand Islands
- Town of Gananoque
- Township of Athens
- Township of Front of Yonge
- Township of Elizabethtown-Kitley
- City of Brockville.

1.3.2 Provincial Government

There are a number of provincial agencies that we work closely with for water management. These include:

- Ministry of Environment
- Ministry of Natural Resources

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- Ministry of Municipal Affairs and Housing
- Ministry of Agriculture, Food and Rural Affairs.

We also work closely with two local health units – the Lanark-Leeds-Grenville District Health Unit and Kingston Frontenac Lennox and Addington Public Health. The provincially-sponsored stewardship councils are also important partners, particularly in landowner contact and the delivery of programs to landowners.

1.3.3 Federal Government

The federal government has many interests in the CSPA, including that of landowner. Major properties include the Rideau Canal National Historic Site, Canadian Forces Base Kingston, St. Lawrence Islands National Park, and several prisons. The Canadian Coast Guard, Canadian Forces Base Kingston, Correctional Services Canada, Environment Canada, Fisheries and Oceans Canada, and Parks Canada are federal organizations that have been or will be involved in the source protection planning process.

1.3.4 Adjacent Source Protection Regions

The Cataraqui Source Protection Authority and Source Protection Committee are coordinating their efforts with the three neighbouring source protection regions, including the Quinte, Mississippi-Rideau, and Raisin-South Nation. This builds on a long tradition of cooperation between conservation authorities. In recent years, we have worked together on common communications, mapping, and technical products and have used a coordinated approach when sharing information with municipalities. Our intent is to provide a consistent level of information wherever possible, for the benefit of those municipalities that fall into more than one source protection area.

1.3.5 Interested Stakeholders, Engaged Public and NGOs

There are many stakeholders and non-governmental organizations in the Cataraqui area that have an interest in supplies of clean and plentiful water. The agricultural community, tourism and recreation sector, lake associations, aggregate operators and the manufacturing industry are well represented in the area. Each of these sectors is represented on the SP Committee, and the CRCA also has ongoing interaction with a wide range of stakeholders.

1.4 Scope and Purpose of the Assessment Report

1.4.1 Scope of the Report

The scope of this *Assessment Report* is defined by the Terms of Reference for the Preparation of an Assessment Report and a Source Protection Plan: Cataraqui Source Protection Area (Cataraqui Source Protection Committee, 2009). The focus is on the 12 local *drinking water systems* in the municipal residential category that is defined by the Ontario Ministry of the Environment (see **Table 1-1**).

Table 1-1: Municipal Residential Drinking Water Systems in the CSPA

Drinking Water System	Municipal Drinking Water Source
A.L. Dafoe (Napanea)	Surface Water Intake
Bath	Surface Water Intake
Brockville	Surface Water Intake
Cana Well Supply (Kingston)	Groundwater Well
Fairfield (Amherstview)	Surface Water Intake
James W. King (Gananoque)	Surface Water Intake
Kingston Central	Surface Water Intake
Lansdowne Well Supply	Groundwater Well
Miller Manor Apartments Well Supply (Mallorytown)	Groundwater Well
Point Pleasant (Kingston West)	Surface Water Intake
Sandhurst Shores (Napanea)	Surface Water Intake
Sydenham	Surface Water Intake

This report also includes information about the general state of groundwater resources across the entire Cataraqui area (see Chapter 5). Future versions of the *Assessment Report* may also include technical findings related to other public *drinking water systems* and/or clusters of private intakes or wells. These systems would only be considered after they were added to the Terms of Reference through a municipal resolution, or at the direction of the Ontario Minister of the Environment.

1.4.2 Purpose of the Report

The main purpose of the report is to prioritize *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 SP Committee, to prepare the Cataraqui Source Protection Plan (forthcoming). *Drinking water issues* and *threats* that are prioritized in this document will be the main focus of discussion for the development of this plan.

The report also serves as a summary of technical findings. For more detailed findings about a specific topic or location, the reader is invited to reference the individual technical reports, each of which are listed in the references section and are held at the CRCA offices in Glenburnie (Kingston). Many of the technical reports are included in **Appendix ‘L’**.

1.4.3 Content of the Report

The Ontario Clean Water Act, 2006 establishes the following minimum content requirements for the *Assessment Report*:

- Identify all the *watersheds* and *subwatersheds* in the source protection area
- Characterize the quality and quantity of water in each *watershed*
- 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
- Identify all *significant groundwater recharge areas* and *highly vulnerable aquifers* that are in the source protection area
- Identify all *surface water intake protection zones (IPZ)* and *wellhead protection areas (WHPA)* that are in the source protection area
- 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)
- List *activities* that are or would be *drinking water threats*, and
- Identify the areas where an *activity* listed under clause (g) is or would be a significant *drinking water threat*.

This *Assessment Report* includes information in support of each of the above items.

1.5 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 described in Ontario Regulation 287/07 General, the Technical Rules: Assessment Report (MOE, 2009a)(see **Appendix ‘L-1’**), 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.

This *Assessment Report* includes findings from several component technical studies that have been completed for the CSPA since 2005. They include:

- Cataraqui Groundwater Vulnerability Analysis Study (2008)
- Drinking Water Source Protection Water Budget Conceptual Report (2009)
- Cana Subdivision Wellhead Protection Area Study (2008)
- Climate Change: Considerations for Water Budget Study (2009)
- Eastern Lake Ontario / Upper St. Lawrence River Intake Protection Zone Study (2009)

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- Eastern Lake Ontario / Upper St. Lawrence River Intake Protection Zone 3 Consideration of Significant Threats Report (2010)
- Frontenac Islands Groundwater and Aquifer Characterization Study (2007)
- Issue Evaluation: Cataraqui Source Protection Area (2009)
- LANDSAT Image Analysis: Cataraqui Source Protection Area (2006)
- Lansdowne Wellhead Protection Area Study (2011) (in conjunction with Tier 2 study)
- Lansdowne Tier 2 Water Budget Study (2011) (in conjunction with WHPA study)
- Miller Manor Apartments Wellhead Protection Area Study (2009)
- Sydenham Intake Protection Zone Study (2009)
- Sydenham Tier 2 Water Budget Study (2010)
- Sydenham Tier 3 Water Budget Study (2011)
- Threat Assessment: Cataraqui Source Protection Area (2010)
- Tier 1 Water Budget Study: Cataraqui Source Protection Area (2010)
- Watershed Characterization Study: Cataraqui Source Protection Area (2008).

Appendix ‘L’ contains digital copies of the reports for most of the above studies. This *Assessment Report* also contains findings from the ongoing Picton Intake Protection Zone Study and the Westport Wellhead Protection Area Study.

The studies have been completed under the supervision of technical advisory groups; typical members on each group included CRCA staff, municipalities, public health units, and others. In addition, all of the studies have been subject to a peer review by a neutral third party who is qualified in the type of technical work. The SP Committee hosted 13 municipal and public open houses to share the draft findings with the community, and to seek feedback and local knowledge. The findings have been carefully reviewed by Conservation Authority staff and they have been received by the SP Committee for inclusion in this document.

Additional information about the technical methods used is presented in Chapter 3 (*water budget*), Chapter 4 (water quality risk assessment), Chapter 5 (groundwater sources across the CSPA and *wellhead protection areas*) and Chapter 6 (*intake protection zones*).

1.6 Limitations

This report has been prepared using the best data and knowledge available at the time of publication. *Data gaps* are described in Chapter 8 and are outlined in **Appendix ‘K-1’**. Other topics for additional research are outlined in **Appendix ‘K-2’**. The authors encourage the reader to contact the CRCA in Glenburnie (Kingston) for updated information when conducting research about a specific topic or location.