DRINKING WATER SOURCE PROTECTION
Our Actions Matter

LAKE ERIE SOURCE PROTECTION REGION

Grand River Source Protection Area

ASSESSMENT REPORT

Prepared on behalf of:
Lake Erie Region Source Protection Committee

Under the Clean Water Act, 2006
(Ontario Regulation 287/07)

Version 10.1

July 29, 2025

This project has received funding support from the Government of Ontario.



Note: Please refer to Volume I of the Grand River Source Protection Plan for a complete list of version numbering and a high-level description of amendments that have been made since original approval.

EXECUTIVE SUMMARY

The Grand River Source Protection Area Assessment Report was submitted to the Ministry of the Environment on April 30, 2012, and received approval on August 16, 2012. Since that time, the Assessment Report has been revised, updated and approved a number of times to incorporate new information made available over the years.

The Assessment Report summarizes the technical studies undertaken in the Grand River Source Protection Area (watershed) to delineate areas around municipal drinking water sources that are most vulnerable to contamination and overuse. Within these vulnerable areas, historical, existing and possible future land use activities were identified that could pose a threat to municipal water sources. Technical studies include a characterization of the human and physical geography of the watershed, a water budget and water quantity stress assessment, an assessment of groundwater and surface water vulnerability, a land use activity inventory, and an evaluation of existing water quality and quantity issues.

The findings of the Tier 2 Water Budget and Risk Assessment studies (AquaResource, 2009b) indicate that ten municipal water systems require additional Tier 3 Water Quantity Risk Assessments: Elora/Fergus in the Township of Wellington Centre; Rockwood and Hamilton Drive in the Township of Guelph/Eramosa; the City of Guelph system including the Eramosa intake; Elmira, West Montrose, Conestogo Plains, and the Integrated Urban System in the Regional Municipality of Waterloo; and Bright in the County of Oxford. The subwatersheds within which these water supplies were assessed as having either the potential for moderate or significant stress under current or future conditions.

Within the Grand River watershed, Tier 3 studies have been completed for municipal drinking water systems within the City of Guelph, Guelph/Eramosa Township (GGET), the Region of Waterloo, the Bethel Wellfield in the County of Brant, the Bright Wellfield in Oxford County, and the Township of Centre Wellington. Further information on the Region of Waterloo Tier 3 study, the Whitemans Creek Tier 3 study and the Centre Wellington Tier 3 study is found in Chapters 19, 20 and 22, respectively. The results of the GGET Tier 3 study will be incorporated into the assessment report through future updates.

The vulnerable areas in the Waterloo Tier 3 Assessment are represented by four wellhead protection areas for water quantity (WHPA-Qs). The consumptive water users and potential reductions to groundwater recharge within the WHPA-Qs were not classified as Significant or Moderate water quantity threats, therefore no water quantity policies were created for the WHPA-Qs.

A Tier 3 Assessment was completed for the Centre Wellington (Fergus and Elora) drinking water system. A WHPA-Q was delineated surrounding the Centre Wellington municipal wells and around other water takers in the portions of neighbouring townships of Woolwich, East Garafraxa, Mapleton, Guelph/Eramosa, Wellington North and Towns

of Grand Valley and Erin. The Centre Wellington WHPA-Q is assigned a significant risk level, therefore water quantity threats were identified in the WHPA-Q.

Tier 3 Assessments were completed for the Town of Halton Hills and the Town of Orangeville. Although the Town of Halton Hills and the Town of Orangeville do not have wells located within the Grand River Watershed, the Wellhead Protection Areas for Quantity extend into the Grand River Source Protection Area.

Threats relating to excavation activities below the water table that breach the confining layer protecting an aquifer for drinking water source are not currently identified as activities that may be a threat to drinking water. The Lake Erie Region Source Protection Committee has urged the Minister of the Environment and the Director of the Source Protection Programs Branch to add excavation that breaches the aquitard protecting a municipal drinking water supply aquifer to the list of activities that are local drinking water threats.

The results of the technical studies have been used to develop policies to protect sources of municipal drinking water. These policies have been developed by municipal and conservation authority staff, in consultation with property and business owners, farmers, industry, health officials, community groups and others working together to develop a fair, practical and implementable Source Protection Plan. Public input and consultation played a significant role throughout the process.

Note: New and former names of Provincial Ministries are used within this document. Name changes are documented as follows:

Table A: Ministry of Environment, Conservation and Parks (MECP)

Date	Name
Pre-2014	Ministry of the Environment (MOE)
2014	Ministry of Environment and Climate Change (MOECC)
2018	Ministry of the Environment, Conservation and Parks (MECP)

Table B: Ministry of Natural Resources (MNR)

Date	Name
Pre-2014	Ministry of Natural Resources (MNR)
2014	Ministry of Natural Resources and Forestry (MNRF)
2021	Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF)
2022	Ministry of Natural Resources and Forestry (MNRF)
2024	Ministry of Natural Resources (MNR)

Table C Ministry of Agriculture, Food and Agribusiness (OMAFA) and Ministry of Rural Affairs (OMRA)

Date	Name
Pre-2024	Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
2024	Ministry of Agriculture, Food and Agribusiness (OMAFA) and Ministry of Rural Affairs (OMRA)

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1.0 INTRODUCTION TO DRINKING WATER SOURCE PROTECTION

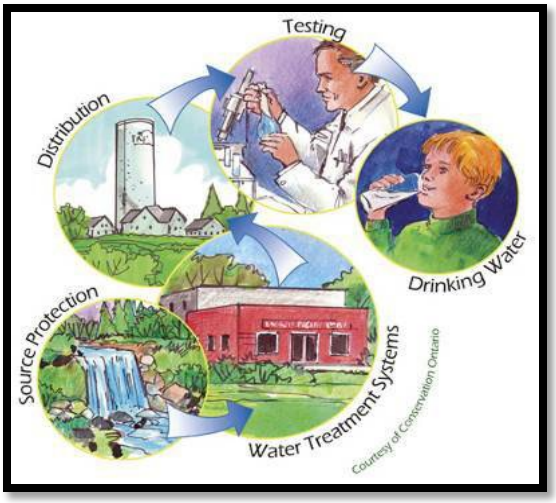
Following the public inquiry into the Walkerton drinking water crisis in May 2000, Justice Dennis O'Connor released a report in 2002 containing 121 recommendations for the protection of drinking water in Ontario. Since the release of the recommendations, the Government of Ontario has introduced legislation to safeguard drinking water from the source to the tap, including the *Clean Water Act* in 2006. The Act provides a framework for the development and implementation of local, watershed-based source protection plans, and is intended to implement the drinking water source protection recommendations made by Justice Dennis O'Connor in Part II of the Walkerton Inquiry Report. The Act came into effect in July 2007, along with the first five associated regulations.

The intent of the *Clean Water Act, 2006* is to ensure that communities are able to protect their municipal drinking water supplies now and in the future from overuse and contamination. It sets out a risk-based process on a watershed basis to identify vulnerable areas and associated drinking water threats and issues. It requires the development of policies and programs to reduce or eliminate the risk posed by significant threats to sources of municipal drinking water through science-based source protection plans.

Source Protection Committees are working in partnership with municipalities, Conservation Authorities, water users, property owners, the Ontario Ministry of the Environment, Conservation and Parks (MECP), Ministry of Natural Resources (MNR), and other stakeholders to facilitate the update of local, science-based source protection plans.

The *Clean Water Act, 2006* and Drinking Water Source Protection are one component of a multi-barrier approach to protecting drinking water supplies in Ontario. The five steps in the multi-barrier approach include:

- Source water protection
- Adequate treatment
- Secure distribution system
- Monitoring and warning systems
- Well thought-out responses to adverse conditions



After the Walkerton Inquiry, the Government of Ontario enacted the *Safe Drinking Water Act, 2002* which provides new requirements and rules for the treatment, distribution and testing of municipal drinking water supplies. Together, the *Clean Water Act, 2006* and *Safe Drinking Water Act, 2002* along with their associated regulations, provide the legislative and regulatory framework to implement the multi-barrier approach to municipal drinking water protection in Ontario.

The protection of municipal drinking water supplies through the *Clean Water Act, 2006* is one piece of a much broader environmental protection framework in Ontario. Water resources in Ontario are protected directly and indirectly through the federal and provincial governments, municipalities, conservation authorities and public health units.

1.1 Source Protection Planning Process

The key objectives of the source protection planning process are to complete science-based Assessment Reports that identify the risks to municipal drinking water sources, and to develop local Source Protection Plans that set out policies to reduce the risks to current and future sources of drinking water. A detailed description of the source protection planning process within the Lake Erie Source Protection Region can be found in Volume I of the Grand River Source Protection Plan. During all phases of Source Protection Plan development, including creation of the Terms of Reference and Assessment Report, consultation with stakeholders and the public has been undertaken in accordance with the requirements of the *Clean Water Act, 2006*. A summary of all consultation activities can be found in Volume I of the Grand River Source Protection Plan and a summary of any comments that impacted the development of Plan policies can be found in the Explanatory Document.

1.2 Framework of the Assessment Report

The Grand River Source Protection Area Assessment Report was completed in compliance with Ontario Regulation 287/07 (General) under the *Clean Water Act, 2006* which sets out the minimum requirements for Assessment Reports. In addition, the technical work summarized in this Assessment Report was completed in conformance with the *Technical Rules: Assessment Report* under O. Reg. 287/07. The technical work was undertaken by municipalities and the Grand River Conservation Authority.

Within the Grand River Source Protection Area (SPA), there are 39 upper and lower tier municipalities and two First Nations communities. At present, there are 42 municipal residential drinking water systems, including two integrated groundwater/inland river systems (Region of Waterloo and City of Guelph), two inland river systems (City of Brantford and Six Nations of the Grand River), and one system (Dunville) that includes a backup inland river intake in the Grand River Source Protection Area and a Lake Erie intake outside of the source protection area. In addition, one pipeline system from Lake Ontario (City of Hamilton water supply) also supplies water to residents in the communities of Caledonia and Cayuga.

The *Clean Water Act, 2006* focuses on the protection of municipal drinking water supplies; however, the Act allows for other water systems to be considered, including clusters of

private wells, communal systems, and other non-municipal supplies. Only municipalities within which the supplies are located or the Minister of the Environment, Conservation and Parks, have the power to add additional non-municipal systems. To date, no municipalities in the Grand River Source Protection Area have designated non-municipal drinking water supplies under the *Clean Water Act, 2006*. The Minister of the Environment included the Ohsweken Water Treatment Plant: a non-municipal system that serves a major residential development on the reserve of the Six Nations of the Grand River.

The technical studies summarized in this Assessment Report start with information at the watershed scale, and then move to the municipal drinking water system scale. The document is organized into the following sections: Watershed Characterization, Water Quality Threat Assessment Methodology, Water Quality Risk Assessment (including groundwater vulnerability, Water Budget Framework, Tier 2 Water Budget, Tier 3 Water Budgets, and sections dedicated to each municipality's Wellhead Protection Areas and Intake Protection Zones); State of Climate Change Research; Great Lakes Considerations; and Conclusions.

1.3 Continuous Improvement

The findings of this Assessment Report are based on the best available information. It is recognized that new information that informs the findings of this Assessment Report will become available in the future. Beyond the completion of this Assessment Report, municipalities and conservation authorities will continue to refine and improve the findings, and attempt to address the data gaps documented in the Report. As new or improved information becomes available, the relevant components of the Assessment Report will be amended as required. Opportunities for input and review of updated Assessment Reports will be made available to those affected by the proposed changes.

The first draft of the Assessment Report underwent several revisions before Version 1 of the Source Protection Plan was approved in 2015. At that time, the Assessment Report became part of the Source Protection Plan and both documents are now amended and assigned a version number together. Previous versions of the Assessment Report were referred to as drafts or updates. Numerical versioning has since been implemented to better track amendments following approval in 2015.

A list of version numbering and a high-level description of amendments can be found at the beginning of Volume I of the Source Protection Plan and will be kept updated as future amendments occur.