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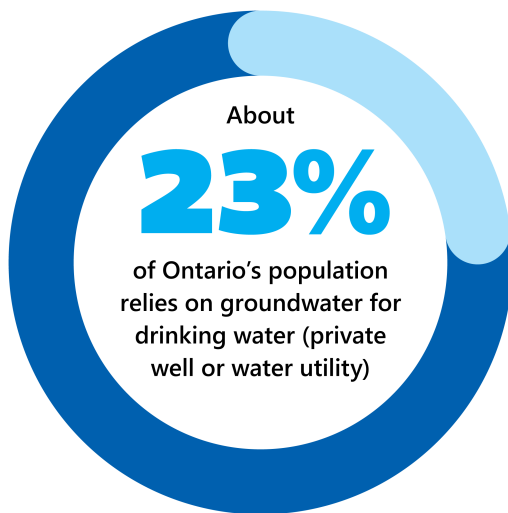
The Great Lakes Commission (GLC) passed a policy resolution in March 2024 which called upon partners and agencies to engage with the GLC toward a better understanding of the current state of groundwater management in the Great Lakes basin.¹ Then, in December 2024, the GLC received funding from the Joyce Foundation to develop groundwater management summaries for each Great Lakes jurisdiction, building upon previous reports supported by the Joyce Foundation.² This report summarizes groundwater management in Ontario, both throughout the province and within the Great Lakes-St. Lawrence River basin.

Provincial Ministry Authority

The Ontario Ministry of the Environment, Conservation and Parks (MECP) is charged with the conservation of the groundwater resources of the province and the control of the use of these resources in an effective manner for the public good. MECP regulates the use of groundwater in the province and the discharge of pollutants into the environment. The ministry monitors ambient groundwater quantity and quality conditions, including the

maximum concentrations of contaminants in groundwater, and sediment. MECP also oversees drinking water source water protection; 19 multi-stakeholder source protection committees across Ontario representing various interests have developed local source protection plans for 38 'source protection areas' across Ontario that identify actions to protect water sources for municipal drinking water systems.^{3,4}

The Ontario Geological Survey, as part of the Ontario Ministry of Energy and Mines, aims to improve understanding of provincial groundwater resources and availability. **Table 1** highlights the provincial ministries in Ontario which play a role in managing groundwater in the province.



¹ Great Lakes Commission. March 6, 2024. [Understanding Impacts to Great Lakes Agriculture and Water Use Under Changing Climate Conditions.](#)

² The Joyce Foundation. [Groundwater Governance in EPA Region 5.](#)

³ Ontario Ministry of the Environment, Conservation and Parks. [Source Protection.](#)

⁴ Ontario Ministry of the Environment, Conservation and Parks. [Incorporation of the reasonable use concept into MOEE groundwater management activities, Guideline B-7.](#)

Table 1. Ontario provincial ministry organization around groundwater priority areas.

Agency	Ontario Ministry of the Environment, Conservation, and Parks	Ontario Ministry of Energy and Mines
Groundwater Priority Area	Drinking water supply and oversight (including groundwater wells and plants) Groundwater quality and quantity oversight State of groundwater quality and quantity monitoring Groundwater appropriation or permitting Source water protection Water supply planning Limited well pumping restriction High-capacity well impact investigations	Groundwater (geoscience and mapping)

Groundwater Science and Knowledge Production

The MECP manages a map of well record information from approximately 1 million reported wells throughout Ontario.⁵ Ontario Regulation 903 (Wells), made under the *Ontario Water Resources Act*, requires the person who constructs, upgrades or properly abandons a well to submit a copy of the well record to the well purchaser, landowner and the MECP.⁶

Ontario's Provincial Groundwater Monitoring Network monitors ambient groundwater quantity and quality conditions in the province.⁷ The network consists of 480 monitoring wells across the province for long-term monitoring, including annual groundwater quality sampling and hourly groundwater level measurement. The monitoring data, published on the Ontario Data Catalogue, provide indicators of aquifer conditions and support decisions around water-takings, drought management, land use planning and infrastructure development, climate change adaptation, source water protection, water budgets and cumulative impact studies. Conservation Authorities and the Severn Sound Environmental Association are involved in the program delivery.

Under the *Clean Water Act*, each source protection area has prepared an assessment report to protect drinking water at its source (lakes, rivers, and groundwater) by identifying vulnerabilities and risks. Assessment Reports consist of three main parts:

1. Watershed characterization: an overview of the watershed location of drinking water systems.
2. Vulnerability assessment: assessing the vulnerability of sources of drinking water to contamination (water quality) or depletion (water quantity/water budgets).
3. Threats assessment: identification and enumeration of risks to drinking water in vulnerable areas. Risks are classified into significant, moderate and low.

⁵ Ontario Ministry of the Environment, Conservation and Parks. [Map: Well records.](#)

⁶ Ontario Water Resources Act R.R.O. 1990, Regulation 903. <https://www.ontario.ca/laws/regulation/900903>

⁷ Ontario Ministry of the Environment, Conservation and Parks. [Map: Provincial Groundwater Monitoring Network.](#)

Vulnerability assessments consider both water quality and quantity. Through these analyses four types of vulnerable areas are delineated:

- Intake Protection Zone (Quality and Quantity)
- Well Head Protection Area (Quality and Quantity)
- Significant Groundwater Recharge Areas (Quantity)
- Highly Vulnerable Aquifers (Quality)

Ontario's Source Protection Information Atlas⁸ is an online tool that offers the ability to search a location to see if it is in a vulnerable area (i.e., close to a municipal drinking water well or other drinking water intake).

The Ontario Geological Survey Publications (PUB) Database houses a large collection of geological reports, maps, and books that the Ontario Geological Survey (OGS) has published over the years.⁹ The ambient groundwater geochemistry project, which was initiated in 2007, has collected over 6660 samples of groundwater from untreated bedrock- and surficial sediment-derived aquifers across all of southern Ontario and parts of northeastern Ontario, with the aim of understanding relationships between aquifer composition and groundwater quality, as well as understanding the flow history, residence time and vulnerability of individual and regional groundwater sources. The OGS released digital datasets and maps for all of southern Ontario in 2021 (MRD283-REV2) and for northeastern Ontario in 2024 (MRD401).

Legislation and Regulations

The *Ontario Water Resources Act* (OWRA) provides for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use, in order to promote Ontario's long-term environmental, social and economic well-being. The OWRA prohibits the discharge of pollutants to surface water or groundwater and regulates discharges from sewage works.¹⁰ An Environmental Compliance Approval (ECA)¹¹ may be required if the combined daily sewage discharge is 10,000 litres per day (LPD) or more.

Water takings in Ontario are governed by the OWRA and the Water Taking and Transfer Regulation (O. Reg. 387/04), a regulation under the Act. Section 34 of the OWRA requires anyone taking more than a total of 50,000 litres of water in a day, with some exceptions, to obtain a Permit to Take Water (PTTW).¹² All applications for PTTWs are evaluated carefully to assess the risks of water taking to existing water users and to the environment; for higher-risk applications, proponents must submit supporting technical studies which are reviewed by ministry scientists. Generic as well as site-specific conditions are included in PTTWs to manage any risks via appropriate monitoring, reporting, and contingency measures. Where the ministry determines that cumulative effects of water withdrawals may need to be considered, the ministry can require further studies and initiate assessment to determine whether a Water Taking Management Strategy is required to manage water takings within a defined area.¹³

The province completed a review of the state of water resources in key areas of Ontario and the effect water takings have on these resources. This review examined water quantity-related policies and programs as they apply to water takers across the province, including water bottlers taking groundwater, and sought to improve

⁸ Ontario Ministry of the Environment, Conservation and Parks. [Source Protection Information Atlas](#).

⁹ Ontario Ministry of Energy and Mines. [Ontario Geological Survey Publications database](#).

¹⁰ Ont. Water Res. Act: Sect. 34; Water Transfer and Taking Reg. 387/04

¹¹ Ont. Water Resources Act: Sect: 53; Sewage Works. <https://www.ontario.ca/laws/statute/90o40>.

¹² Requirements of the permit system, including the factors a Director must consider in issuing a permit, notification and consultation, data collection and reporting, are contained in Section 34 of the OWRA and the amended Water Taking and Transfer Regulation.

¹³ Ontario Ministry of the Environment, Conservation and Parks. [Guidance to support area-based water quantity management](#).

understanding of how water takings can be managed to ensure sustainable water resources in the face of changing climate and continued population growth.

The province's review found that Ontario's current approach to managing water takings is effective. A panel from Professional Geoscientists Ontario reviewed and validated the government's findings and found that water takings for water bottling are managed sustainably in Ontario under existing legislation, regulation, and guidance. The review also identified opportunities to improve how water takings are managed in parts of Ontario where water availability is or could become a concern.

Based on the findings of the review, enhancements to the province's water taking program were undertaken. These changes include:

- requiring water bottling companies to have the support of their local host municipality for new or increase groundwater takings in their community;
- establishing priorities on how water should be shared among water users when there are competing demands for water (e.g., restrictions on water taking could be applied during a drought);¹⁴
- putting in place a new, more flexible approach for the ministry and water users to better assess and manage multiple water takings in areas where water sustainability is a concern;¹⁵ and
- making water taking data available to the public to increase transparency of how Ontario manages water resources.¹⁶

The Ontario *Environmental Protection Act* prescribes requirements for short-term well pumping tests that are conducted to obtain aquifer information, withdraw between 50,000 and 5,000,000 LPD and occur over seven or fewer days of taking within a 30-day period. While such tests do not require a PTTW, they must be registered on Ontario's Environmental Activity and Sector Registry.

MECP requires sufficient levels of environmental control to protect reasonable uses of groundwater for present and future users in the province. The Ministry decision as to what constitutes reasonable uses of groundwater (either existing or potential) on land associated with, or adjacent to, disposal sites shall be made on a case-by-case basis due to the wide variation in the quality, quantity and availability of groundwater.¹⁷

The *Clean Water Act, 2006*, together with its regulations and Technical Rules, provides the framework for drinking water source protection in Ontario. Local multi-stakeholder source protection committees and source protection authorities (generally conservation authorities) use a science-based approach to identify activities that could pose a risk of contamination or depletion of their drinking water sources. The committees and authorities then prepare source protection plans with a series of locally developed policies that protect existing and future sources of municipal drinking water. These plans generally apply to municipal drinking water systems within source protection areas (which cover southern Ontario and key urban centers in the north), including systems that rely partly or wholly on groundwater. Plans are implemented by municipalities, source protection authorities, and others. Source protection authorities review and update their local assessment reports and source protection plans to reflect current science, address implementation challenges (e.g., changes to existing municipal drinking water systems), and add new systems.

¹⁴ The ministry has published guidance to support the implementation of the new priorities of water use policy.

¹⁵ The ministry has published guidance to support the implementation of the new area-based water quantity management policy.

¹⁶ Actual volumes of water taken by permitted water takers was made available to the public starting in July 2022.

¹⁷ Ontario Ministry of the Environment, Conservation and Parks. [Incorporation of the reasonable use concept into MOEE groundwater management activities, Guideline B-7.](#)

Great Lakes-St. Lawrence River Basin Groundwater Management

Ontario is a signatory to the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement (Agreement) and has implemented the Agreement through the OWRA and PTTW program. Under the OWRA, transfers of water outside of Ontario's major water basins (including the Great Lakes Basin) are prohibited. Water takings and transfers of water between Great Lakes watersheds (i.e., intra-basin transfers) are regulated according to the requirements and standards in the Agreement. While water takings for ordinary household purposes, watering of livestock or poultry and firefighting purposes are normally exempt under the OWRA from requiring a permit, a permit would be required for a water taking for those purposes involved in an intra-basin transfer of 379,000 LPD or more.

Ontario adopted the water conservation and efficiency goals as set out in the Agreement. A collection of water management policies and programs across multiple Ontario ministries constitutes the province's water conservation and efficiency program under the Agreement.

Under the PTTW program, all permit holders are required to monitor their daily water takings and report annually the amounts to MECP.¹⁸ These data contribute to Ontario's annual reporting of water use under the Agreement.

Per the Agreement, its party states and provinces commit to the development of a collaborative strategy to guide the collection and application of scientific information to support the "improved understanding of the role of groundwater in basin water resources management."

The Province of Ontario's program is consistent with, and fully supports, the goals and objectives of the Agreement, including promoting the efficiency of use and reducing losses and waste of water in the basin and retaining the quantity of surface water and groundwater in the basin.

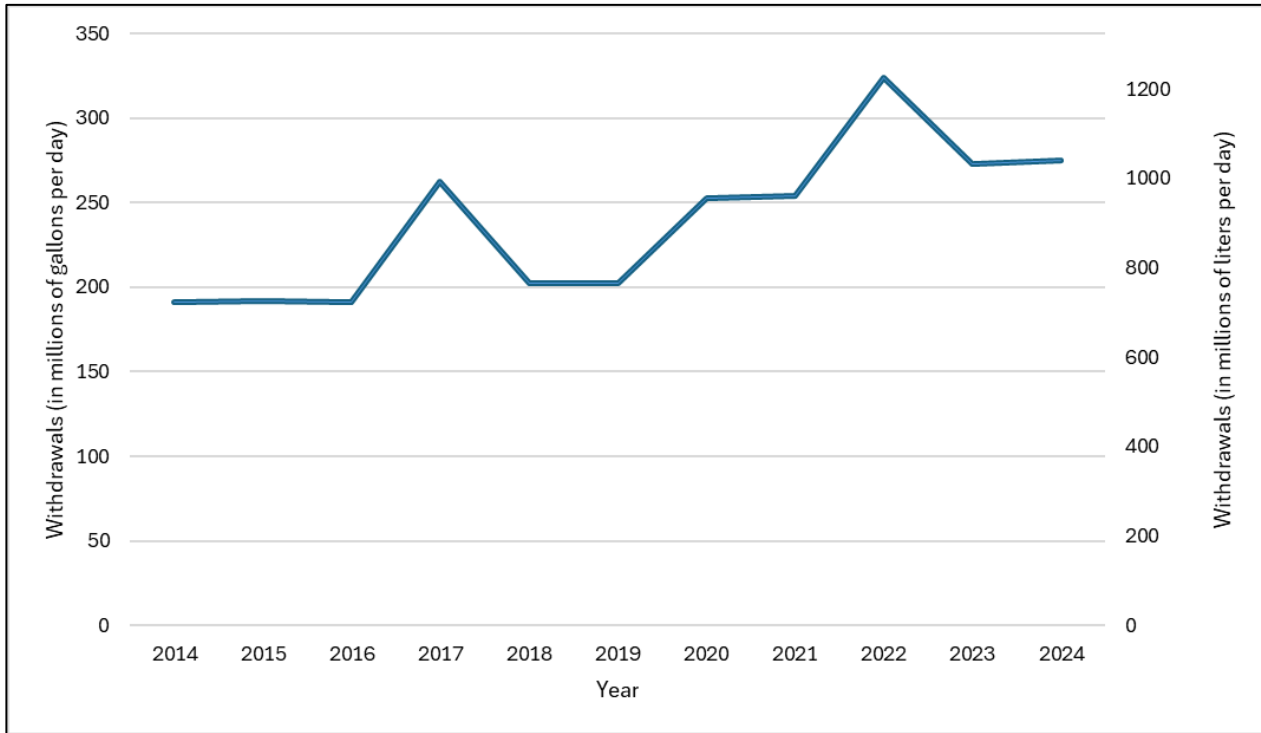
The Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem (COA) is the principal mechanism through which Ontario and Canada coordinate their work to address their respective and shared commitments to restore, protect, and conserve the Great Lakes, including improving understanding of the influences of groundwater-surface water interaction, point sources of pollution, and groundwater stressors on Great Lakes water quality and ecosystem health. It supports Ontario's implementation of Ontario's Great Lakes Strategy and Canada's commitments under the 2012 Canada-U.S. Great Lakes Water Quality Agreement.

Great Lakes-St. Lawrence River Basin Groundwater Usage

Ontario's groundwater withdrawals from the Great Lakes basin have generally increased over the last decade but have fluctuated depending on the year. A possible factor for this variation is annual water demand for agricultural irrigation – which heavily relies on groundwater – depending on weather conditions. See **Figure 1** below to view trends in Ontario's reported groundwater withdrawals within the Great Lakes basin from each facility taking at least 379,000 LPD between the years of 2014 and 2024.

¹⁸ Ontario Water Management Program Report. 2019. <https://www.glsregionalbody.org/media/sjqfdsy2/on-water-management-program-report-2019.pdf>

Figure 1. Ontario Great Lakes-St. Lawrence River Basin Groundwater Withdrawals from 2014-2024.¹⁹



Provincial Definitions

Groundwater: Groundwater is water that seeps into the ground and passes through subsurface materials such as soil, sediment and bedrock.²⁰

High-capacity well: A well that can yield a rate of more than 60 litres per second could be considered a high yield (high-capacity) well.²¹

¹⁹ As reported to the [Great Lakes Regional Water Use Database](#).

²⁰ Ontario Ministry of Agriculture, Food and Agribusiness. [Understanding groundwater](#).

²¹ Ontario Ministry of the Environment, Conservation and Parks. Water Supply Wells: Requirements and Best Practices [2. Definitions & Clarifications](#).