! A provincewide shutdown is in effect as of Saturday, December 26, 2020 at 12:01 a.m. Learn about the restrictions and public health measures that are in place.

Ontario

# Minister’s annual report on drinking water (2020)

Read an overview of our programs, policies and initiatives to protect drinking water in Ontario.

## Minister’s message

2020 has been a year of many unexpected challenges as a result of COVID-19. Throughout these unprecedented times, Ontario has worked tirelessly to protect the health and wellbeing of Ontarians. Across government, the focus has been on keeping the people of this province safe while ensuring the continuity of critical operations, good and services.

One of the biggest concerns my ministry had early on was the potential impact of the pandemic on the operations of drinking water and wastewater systems across the province. Throughout these uncertain times, Ontario has remained committed to protecting water resources and staff have been working diligently to help ensure our water is safe to drink. Since first learning of COVID-19, the province took early and decisive action to help ensure that drinking water and other vital water services continue to be available and that our drinking water remains among the best protected in the world.

Providing clean, safe drinking water to Ontarians is a priority for this government and a commitment in our Made-in-Ontario Environment Plan. I am proud to report that the work the ministry and our partners are doing is helping to effectively safeguard drinking water in Ontario. The 2019-20 data provided in the Chief Drinking Water Inspector’s 2019-2020 Annual Report shows that 99.9 per cent of the over 523,000 drinking water tests from municipal residential drinking water systems met Ontario’s strict, health-based drinking water standards.

This summer, the ministry consulted on proposed enhancements to Ontario’s water taking program to further protect lakes, waterways and groundwater supplies in the province. These enhancements would give municipalities more direct input on bottled water taking decisions in their communities, help manage water taking in areas where water quantity is a concern and apply priorities of water use where there are competing demands for water. While legislation has now been passed to give municipalities more direct input on bottled water takings, we are continuing to ask the public, stakeholders and Indigenous communities for input on other aspects of this proposal over the winter as we prepare to put the proposed changes into action at the same time that the moratorium ends.

In addition to our work on water quantity, this report also describes the actions we’re continuing to take to protect our water sources in Ontario. It provides an update on the work that ministries, municipalities, conservation authorities and others have been doing to address risks to sources of drinking water through the implementation of source protection plans and policies. My ministry is also involved in various initiatives to reduce excess nutrient inputs to our waterways, such as the Canada-Ontario Lake Erie Action Plan.

As a province, we have made significant progress over the past year, but we recognize there is more work to be done. This includes work to help ensure First Nation communities can also depend on clean drinking water. Throughout the COVID-19 pandemic, we have worked with First Nation leaders and the federal government to proactively identify water and wastewater issues and provided technical support to help respond to urgent needs. We continue to work with them to support the resolution of long-term drinking water advisories and to support the long-term sustainability of each community’s water infrastructure.

While Ontario has one of the most stringent lead testing regimes in Canada, we are taking steps to review our current policies and consult on further actions to reduce levels of lead in drinking water. In 2021, we will consult the public on whether and how to adopt Health Canada’s updated guideline for lead in drinking water, which reduces the maximum acceptable concentration of lead in drinking water from ten to five micrograms per litre. We will also consult on proposed enhancements to Ontario’s already stringent lead protection framework and increasing transparency in lead testing results to keep parents and the public well informed.

Protecting the province’s drinking water and water resources involves collaborative work with several ministries, the Chief Drinking Water Inspector, the Chief Medical Officer of Health and boards of health, water associations, the Walkerton Clean Water Centre, Indigenous communities, the Ontario Clean Water Agency, municipalities, and conservation authorities. By working together, we can be confident that our water supply is clean and safe – both for Ontarians today and generations to come.

**The Honourable Jeff Yurek**
Minister of the Environment, Conservation and Parks

# Protecting Ontario's water resources during the pandemic

The COVID-19 pandemic has presented many challenges in 2020. In Ontario, the government recognized that the pandemic could cause significant impacts, including the potential interruption of the province's drinking water supply. The province responded quickly to support the continued delivery of clean, safe drinking water and other water services to individuals and families in Ontario.

## The COVID-19 virus in drinking water

Ontario has strict regulatory requirements for the disinfection of drinking water that require the use of treatment to remove or kill pathogens, including viruses. Current research also suggests that properly disinfected drinking water does not transmit the COVID-19 virus and infectious virus particles have not been detected in drinking water. To help ensure that we are continually monitoring and keeping apprised of the best available science, our government supports research on COVID-19 detection technologies for water and wastewater.

## Supporting the continued delivery of safe drinking water and wastewater services

Thanks to our strong drinking water protection framework, Ontario had robust emergency planning capacity to help ensure the continued availability of safe drinking water and wastewater services as the pandemic emerged. As required by Ontario's Drinking Water Quality Management Standard, every municipal drinking water system owner and operator had plans in place setting out how they will respond in an emergency, including strategies to address impacts like reduced staffing that may occur in a pandemic.

As early details of the pandemic emerged, the ministry gathered internal subject matter experts as a pandemic planning task force. These experts identified what challenges system owners and operators might face and what support the ministry could offer them to help ensure the continual provision of safe drinking water and wastewater services. These experts used their knowledge of water science and the regulatory framework to establish criteria to determine what types of relief could be given and under what circumstances. In this early planning stage, the ministry gave careful thought to the potential impacts of the pandemic on drinking water and wastewater operations, such as impacts to staffing if workers became sick and the challenges of focusing on both priority and non-priority tasks with a reduced workforce. Providing temporary relief that was granted only on a case-specific basis after thorough analysis by ministry and public health staff (where appropriate) allowed systems to adapt to challenges while continuing to protect human health and the environment.

## Operator training and certification requirements during the pandemic

In March 2020, Ontario took swift action to help ensure that the province's drinking water and wastewater systems continued to operate during the COVID-19 pandemic by making a temporary emergency order under the *Emergency Management and Civil Protection Act*. The emergency order provided temporary operational flexibility to Ontario's drinking water and wastewater system owners and operating authorities so they could address staffing shortages if and when they arose. For example, they could temporarily employ qualified but non-certified individuals to perform operational duties if needed, including knowledgeable and experienced technical personnel, supervisors, managers, professional engineers and operators with recently expired certificates. The emergency order also extended by six months any operator certificates and licences that expired during the emergency order period. This allowed operators to remain certified and licensed as they focused on providing safe drinking water and proper treatment of wastewater. These temporary changes helped ensure the continued operation of our water systems so that clean, safe drinking water was available to the public and that the environment continued to be protected.

To help ensure that drinking water and wastewater systems could continue to operate in a safe and effective manner throughout the pandemic, the ministry also proactively launched a new online portal that helped match drinking water and wastewater system owners with knowledgeable, experienced individuals who were eligible to work as operators. The portal helped build a roster of operators who were previously certified and of available operators-in-training to help employers address potential staffing shortages.

## Site-specific relief

Recognizing that drinking water and wastewater systems would also face other site-specific challenges associated with the COVID-19 outbreak such as facility closures or to support physical distancing, ministry staff worked closely with system owners and operators to provide temporary system-specific relief, where appropriate, to drinking water facilities and municipal wastewater facilities. Relief was only granted when requested and when ministry officials were satisfied that public health and the environment would continue to be protected. For detailed information about the type of system-specific relief provided, please refer to Appendix 1 of the 2019-20 Chief Drinking Water Inspector's Report (https://www.ontario.ca/page/2019-2020-chief-drinking-water-inspector-annual-report#section-9) .

In March 2020, the Minister issued a direction to Conservation Authorities in Ontario enabling them to conduct virtual meetings during times where they cannot meet in person (for example, during emergencies such as the pandemic period). Authorities and source protection committees could then continue to discuss and address important local source water protection issues while protecting the health and safety of staff and committee members.

The ministry also provided temporary extensions on a case-by-case basis to Conservation Authorities that required additional time to submit annual progress reports on their drinking water source protection plans, as required by the *Clean Water Act, 2006 (https://www.ontario.ca/laws/statute/06c22)* . All nine requests for such extensions were assessed to confirm that the relief requested was temporary and any extensions granted by the ministry required that the progress reports would continue to be made public once they were available. The extension addressed administrative reporting deadlines and had no environmental impact; all reports were submitted by the extended deadlines. You can read more about Ontario's source protection plans in the actions to protect water sources section of this report.

### Outreach and support

The ministry also worked to provide additional support to the regulated community and others involved in providing drinking water in the province. The ministry undertook the following activities:

- Providing outreach to First Nations and the Federal government through the ministry's Indigenous Drinking Water Projects Office to help proactively identify any water and wastewater issues relating to the pandemic and offer technical support to help respond to urgent needs.
- Conducting telephone assessments of other drinking water systems, municipal wastewater systems, and licensed laboratories in the province to determine if they were experiencing any difficulties in their ability to complete essential maintenance, operational, sampling, testing and reporting tasks during the pandemic and whether ministry support or technical advice was needed.
- Releasing a guide for building owners that explains water flushing strategies to restore a building's water quality after an extended vacancy. When water sits in pipes for long periods, it can pose a risk to human health. This guide helped ensure that as businesses, schools, child care centres and offices reopened, their plumbing systems were properly flushed so that water was safe to drink. You can read more information about this building plumbing guide in the emerging issues section of this report.
- Sending materials to school and child care centre operators prior to their re-opening. The materials were designed to help operators ensure that water in schools and child care centres was safe to drink before buildings were opened to staff and children. The materials consisted of a letter reminding schools and child care centres of their sampling requirements and flushing obligations under the *Safe Drinking Water Act, 2002 (https://www.ontario.ca/laws/statute/02s32)* and associated regulations and the guide explaining flushing strategies.

The COVID-19 pandemic has impacted all our lives, but thanks in large part to our robust drinking water protection framework, Ontario has been able to address the inherent challenges safely and support continued provision of drinking water and wastewater services in the province. As we continue to deal with COVID-19 and the uncertainties that come with it, the ministry will continue working with system owners and operators, schools, child care centres, businesses, stakeholders and First Nations to help ensure that they have the tools and support they need.

## Ontario's drinking water standards

One of the most important tools for protecting drinking water in Ontario is the application of our strict, health-based drinking water standards. The Ontario Drinking Water Quality Standards regulation (https://www.ontario.ca/laws/regulation/030169) under the *Safe Drinking Water Act, 2002 (https://www.ontario.ca/laws/statute/02s32)* , sets out standards for a total of 151 microbiological, chemical and radiological parameters.

These standards are generally adopted from Canadian drinking water quality guidelines developed through a Federal-Provincial-Territorial process led by Health Canada. Ontario participates in this process and contributes Ontario-specific information and analysis, which informs the setting of national guidelines and serves as the foundation for regulatory standards in the province. Any changes to Ontario's standards are based on scientific evidence, stakeholder engagement, and consultation with the experts on the Ontario Advisory Council on Drinking Water Quality and Testing Standards which is a body established under the *Safe Drinking Water Act, 2002*.

### Lead

Lead is a naturally occurring element that has many industrial uses. Exposure to lead can occur by inhalation of lead-containing particulates in air (including smoke from cigarettes and e-cigarettes), contact with soil that contains lead, eating certain canned foods, some consumer products and from drinking water. However, drinking water generally accounts for a small fraction of total lead exposure to humans.

Factors that contribute to elevated lead levels in drinking water are corrosion in older distribution pipes, lead service lines and plumbing fixtures.

Lead in drinking water can be a significant health concern. Due to the fact that their nervous systems are still developing, children aged six and under are especially susceptible to the neurological and behavioral effects of lead. Lead exposure is also associated with harmful effects on the kidney and can cause hypertension in adults.

**Ontario's actions to reduce exposure to lead**

Ontario has one of the most stringent testing regimes in Canada when it comes to lead in drinking water. Since 2007, Ontario has had requirements in place to test drinking water for lead in municipal drinking water supplies and from drinking water fountains and taps serving schools, private schools and child care centres. In addition to testing for lead within the drinking water system, municipalities are also required to take water samples from residential and non-residential plumbing. Where lead is identified as an issue within municipalities, they may be required to prepare and implement a lead reduction strategy to decrease lead levels. If the plumbing test results exceed the regulatory limit of ten micrograms per litre, the municipality is required to ensure all corrective actions are taken as directed by the local medical officer of health. When there is an exceedance of the provincial lead standard, drinking water systems, child care centres and schools are required to report the result to the province and the local public health unit.

**Continuous improvement**

In March 2019, Health Canada announced an update to the Guidelines for Canadian Drinking Water Quality, reducing the guideline for the maximum acceptable concentration of lead in drinking water from ten to five micrograms per litre.

Ontario's standard for lead in drinking water is currently ten micrograms per litre. The ministry recognizes that lead in drinking water is an important issue for parents and the public and is committed to the protection of children and families That's why the ministry will be consulting with Ontarians on whether and how to adopt Health Canada's reduced guideline for lead in drinking water, proposed enhancements to Ontario's already stringent lead protection framework, and increasing transparency in lead testing results. The ministry expects to begin this consultation process in early 2021.

### Haloacetic acids (HAAs)

Haloacetic acids (HAAs) are disinfection by-products formed when chlorine reacts with organic matter that may be present in the treated water. There is concern that long-term exposures to elevated levels of HAAs may pose a risk to health. Proper operating practices at the drinking water system can reduce the level of organic matter entering the treatment train and thus reduce the formation of HAAs.

A new water quality standard for Haloacetic Acids (HAAs) came into effect on January 1, 2020, under the Ontario Drinking Water Quality Standards regulation (https://www.ontario.ca/laws/regulation/030169) and the *Safe Drinking Water Act (https://www.ontario.ca/laws/statute/02s32)* , 2002.

The standard for Haloacetic Acids is 0.080 milligrams per litre based on a running annual average of quarterly sample results.

Before the new standard came into effect Ontario prescribed a three-year monitoring period during which municipalities were required to measure seasonal variations in HAAs in the distribution system. Drinking water systems used this timeframe to implement treatment process adjustments to minimize the formation of HAAs in order to meet the standard when it came into effect in January 2020.

## Emerging issues

### Tracking science and technology for new/updated standards and guidelines

Through reviews of science, technology and data from our monitoring programs, the ministry identifies potential drinking water priorities for Ontario, some of which may be relevant across Canada. For example, Ontario was the first Canadian jurisdiction to identify 1,4-dioxane (a synthetic chemical that is primarily used as an industrial and commercial solvent) as a potential drinking water issue and recommended it as a priority for national guideline development. Developed through the Federal-Provincial-Territorial process, Health Canada posted a draft guideline for consultation in 2019. A provincial review of additional information on the common chemicals Per – and Polyfluoroalkyl Substances (PFAS) and Perfluoro-Octane Sulfonic Acid (PFOS) has also informed the development of interim approaches to assessing and managing related drinking water issues in Ontario. You can read more about PFAS in the following section.

### Per– and Polyfluoroalkyl substances

Per– and Polyfluoroalkyl Substances (PFAS) are a group of more than 4,000 different human-made chemicals that have been used in industrial and consumer products since the 1940s. They have never been manufactured in Ontario but are found in the environment because they were used in products available here (e.g., coatings on non-stick cookware, stain and water repellant treatments for fabric, fire fighting foams) and they have since migrated into the natural environment where they take a long time to break down.

PFAS are considered an emerging issue because of the limitations in available scientific information about health effects. A number of research studies are revealing new information about potential health effects, including possible impacts to the liver and immune system, developmental effects and cancer. Most information currently available is for a small number of better known PFAS, but jurisdictions are starting to develop guidelines and guidance for assessing PFAS mixtures in the environment.

Ontario has reviewed newer scientific studies and approaches in other jurisdictions to develop interim drinking water advice for assessing PFAS. Advancements in the science will continue to be tracked to inform updates to the ministry's advice.

### Rapid tests to determine the presence of bacteria

Drinking water distribution systems are complex and dynamic environments where numerous physical, chemical and biological interactions and reactions occur involving microorganisms, nutrients and particles. These processes can significantly impact water quality. Waterborne outbreaks of illness have been linked to the degradation of water quality in drinking water distribution systems. Ontario is looking into how new rapid tests could be used to assess water quality in distribution systems. This work is informed by Health Canada guidance on new rapid tests for detection of bacteria, which outlines their advantages over routine culture tests that are performed in a laboratory, that are slower and do not detect as many types of bacteria.

### Plumbing guide for reopening buildings after an extended vacancy

When water remains stagnant in plumbing, there is a potential for the growth of pathogens such as *Legionella* and *Mycobacterium avium*, among others. Inhalation of these pathogens when they become airborne in water droplets, for example during toilet flushing or showering, may lead to respiratory infections with potentially lethal consequences. This year, this concern was elevated due to the COVID-19 pandemic when buildings were left vacant for extended periods of time.

To equip building owners and maintenance personnel with the necessary knowledge and tools to help ensure drinking water was safe before reopening, the ministry worked with other ministries, agencies and experts to make guidance (https://www.ontario.ca/page/guide-maintaining-building-plumbing-after-extended-vacancy) available.

### COVID-19 wastewater surveillance

As part of Ontario's COVID-19 Fall Preparedness Plan to quickly identify, manage and prevent outbreaks, the province is investing $12 million in the development of a COVID-19 wastewater surveillance initiative to test wastewater samples in communities across the province.

Research tells us that testing for COVID-19 in wastewater can provide an early warning system for detecting the virus in communities. Several universities across Ontario are already using wastewater sampling to successfully detect and monitor local outbreaks of COVID-19. Ontario is partnering with these academic institutions, in cooperation with public health units and municipalities, to create an integrated project that expands wastewater sampling and analysis provincewide, including to First Nations and communities with vulnerable populations, such as long-term care homes and correctional facilities.

## Key findings from the Chief Drinking Water Inspector

Ontario's Chief Drinking Water Inspector reports annually on the performance of Ontario's regulated drinking water systems. Data associated with the 2019-2020 Chief Drinking Water Inspector's report is also available on Ontario's Data Catalogue (https://data.ontario.ca/) .

This year's results show that Ontario's drinking water continues to be among the best protected in the world.

### Municipal and laboratory results

More than 80 per cent of Ontario residents get drinking water from a municipal residential drinking water system in the city or town where they live. These drinking water systems are inspected each year to make sure they are following Ontario drinking water regulations.

In addition, all laboratories licensed by the province to perform drinking water testing are inspected twice annually. These laboratories must report the results of all drinking water tests that they are licensed to conduct to the ministry.

The 2019-20 test and inspection results for Ontario's municipal residential drinking water systems and licensed laboratories show that:

- drinking water supplied by municipalities was tested over 523,000 times and 99.9 per cent of tests met Ontario's drinking water quality standards
- all municipal drinking water systems were inspected at least once and laboratories that test drinking water were inspected at least twice during the year
- seventy-one per cent of municipal systems scored 100 per cent on their inspection
- ninety-nine per cent of laboratories received an inspection rating above 80 per cent

## Compliance and enforcement activities

Compliance and enforcement activities are conducted by inspectors to help ensure the regulated community follows Ontario's strict drinking water laws. These activities include education and outreach, routine inspections, following up on adverse water quality incidents, and where necessary, the issuance of an order or a referral for investigation. Where the laws are not followed the inspector works with the drinking water system owner and/or operator to bring them into compliance. If the non-compliance is of a serious nature or the drinking water system owner and/or operator fails to come into compliance, inspectors may issue an order to prompt compliance with the applicable legislation or regulation, or refer them for investigation. In 2019-20 ministry staff undertook the following enforcement activities:

- One order was issued to a municipal residential drinking water system. This order directed the owner of the system to provide proper treatment, monitor treatment equipment, respond to an alarm in a timely manner, review data within the necessary timeframe, and create required records. The inspector is monitoring the progress of the owner's actions and the ministry is also considering further enforcement actions.
- Seven orders were issued to six owners of non-municipal systems that supply water to people's residences such as privately-owned systems that serve apartment buildings, private subdivisions, and mobile home parks. As an example, one of these orders directed the owner of an apartment building to obtain a certified operator to operate and maintain the system. Of the seven orders, three orders have been fully complied with and the ministry is working with the remaining owners to address their non-compliance issues.
- A total of four orders were issued to the owners of privately-owned systems serving four designated facilities. A designated facility provides services to people who can be especially vulnerable to illness, such as children or the elderly, and can include health care facilities, schools, camps, and child care centres. For example, one order directed the owner to provide a sampling plan and a copy of the certificate of analysis for raw microbiological samples. Two orders have been complied with and the ministry is working with the remaining two owners to address their non-compliance issues.
- A total of four orders were issued to owners of four licensed laboratories. For example, some of these orders directed certain laboratories to stop testing without a licence or to stop improperly subcontracting lab work. In all cases, all orders were complied with.

Charges before the courts for more serious violations resulted in convictions:

- The owners, operators and corporations associated with six systems that supply drinking water to residences in cities, mobile home parks and children's camps were convicted and fined a total of $32,750.00. They were convicted for offences that included giving false or misleading information in log book entries and failing to comply with an order to confirm that a certified operator had been hired. One legal entity was convicted of charges relating to supplying drinking water to users of a system without first performing sampling and testing for *E. coli* and total coliform after being shut down for 7 days or more.

## Lead testing

Ontario has the most stringent provincial regime for testing lead in drinking water in the entire country and is the only province that requires lead testing in drinking water from all schools and child care centres. Ontario's Chief Medical Officer of Health reports that there have been no cases of lead toxicity in children due to drinking water in the last ten years.

Lead can enter drinking water through contact with plumbing that contains lead or that was constructed using lead solder. On July 1, 2017, the province expanded testing requirements in Ontario Regulation 243/07 (https://www.ontario.ca/laws/regulation/070243) made under the *Safe Drinking Water Act (https://www.ontario.ca/laws/statute/02s32)* , 2002, to help protect children from lead in drinking water. This change means that every tap or fountain used for drinking water or to prepare food or drinks for children in schools and child care centres must have been tested for lead at least once by January 2020 (for child care centres and schools with primary divisions) or January 1, 2022 (for schools without primary divisions).

When an exceedance(s) of the lead standard is identified, facilities must take immediate corrective action. The local public health unit and the Ministry of the Environment, Conservation and Parks are notified within 24 hours when a testing laboratory detects an exceedance of the standard for lead in a school, private school or child care centre's drinking water sample.

Facilities must take immediate action, including rendering the tap or fountain inaccessible to children by disconnecting or bagging it until the issue is resolved.

Corrective actions can include:

- replacing or removing the fixture
- increasing flushing
- installing a filter
- resampling the fixture that had the exceedance
- taking any other measures as directed

The test results from drinking water samples to date show that the majority of schools and child care centres in Ontario met the provincial standard for lead in drinking water. Ninety-five per cent of more than 50,000 test results in 2019-20 met the province's lead standard. Test results improved when water was flushed through the pipes before the sample was taken. Over 97 per cent of flushed samples met Ontario's standard for lead. The fact that fewer flushed test results exceeded the standard than standing test results is consistent with previous years and demonstrates that flushing is an effective way to temporarily reduce lead levels below the standard for lead. More permanent solutions include replacing or removing the problematic fixtures or installing filters on them and ensuring that the fixtures are maintained and the filters are replaced in accordance with manufacturers' instructions.

### Operator certification and training

Operators of drinking water systems must be trained and certified according to the type and class of the system where they work. Depending on the classification level of the drinking water system in question, operators must complete between 60 and 150 combined hours of continuing education and on-the-job training every three years to renew their certificates. Operators can hold multiple certificates, which allows them to work in more than one type of drinking water system.

As of March 31, 2020, 11,807 certificates were held by 8,207 certified drinking water operators in Ontario. This includes 111 certificates that were extended by the COVID-19 related emergency order held by 105 operators. More details are provided in Section 2 of this report - Protecting Ontario's water resources during the pandemic.

One-hundred and eighty people, including 11 operators with certificates that were extended by the emergency order, were employed as system operators in First Nation communities across the province. The Walkerton Clean Water Centre provides training for operators and owners of drinking water systems provincewide, with a focus on small and remote communities including First Nations.

As of Sept 30, 2020, more than 93,000 persons had been provided with high-quality operator training programs on water treatment equipment, technology and regulatory requirements since the Walkerton Clean Water Centre opened its doors. Operator training programs also covered environmental issues such as water conservation and energy efficiency, with the aim of increasing the sustainability of drinking water operations.

## Actions to support the delivery of clean, safe drinking water in Ontario

### Accreditation audits for drinking water systems and drinking water testing services

Municipal residential drinking water systems and licensed laboratories are required to be accredited by third party organizations designated as accreditation bodies for the purpose of accreditation under the *Safe Drinking Water Act*. In 2020 all operating authorities for the aforementioned drinking water systems were actively accredited to the requirements of the Drinking Water Quality Management Standard and no accreditations were revoked or suspended. Likewise, all licensed laboratories were actively accredited to the requirements of the standard for testing and calibration laboratories and none of the licensed laboratories had their laboratory accreditation status suspended or revoked.

### Year-at-a-glance report initiative

The ministry distributed year-at-a-glance reports to non-municipal year-round residential drinking water systems for a second year in 2020.

Non-municipal year-round residential drinking water systems supply water on a year-round basis to six or more private residences (e.g., detached homes, apartments, condominium units, townhouses and mobile home parks).

This year the distribution of year-at-a-glance reports was expanded to designated facilities. A designated facility is a type of non-municipal drinking water system that provides drinking water to people who may be more at risk of illness. Examples of designated facilities include child care centres, children's camps, and seniors' facilities.

The year-at-a-glance report is tailored to individual drinking water system owners and operators and provides important information for them by summarizing the samples taken at their system throughout the previous calendar year, while identifying missed samples or errors and any adverse sample results.

These simple reports benefit the system's owner and operator and residents who consume the drinking water through the early identification of sampling and testing concerns. Rather than waiting for issues to be identified through a routine inspection, this report allows the ministry to guide owners and operators to modify their sampling behaviour to prevent missed samples and help ensure their contact information is up to date. As this contact information is used for the communication of adverse water quality events, it is critical that it remains updated.

## Actions to support First Nation communities

First Nation communities in Ontario have the highest number of long-term drinking water advisories in the country. As of December 11, 2020, there were 43 long-term drinking water advisories impacting 26 First Nation communities in Ontario.

Although the federal government and First Nations share primary responsibility for safe drinking water on First Nation reserves, Ontario has taken steps to help ensure that First Nation communities also have access to clean drinking water. Ontario has been working collaboratively with First Nation organizations and the federal government by providing technical advice to support safe, sustainable water infrastructure in these communities so they can develop the capacity to resolve long-term drinking water advisories.

The province has collaborated with Political-Territorial Organizations, Tribal Councils and their member communities to assess existing water infrastructure against Ontario standards and support the development of long-term community water infrastructure plans. As of December 2020, a total of 63 water and 17 wastewater assessments and site visits had been completed in 59 First Nation communities.

This work has continued throughout the COVID-19 pandemic. Ontario staff reached out to First Nation communities and the Federal government to proactively identify any water and wastewater issues relating to the pandemic and provided technical support to help respond to urgent needs on a case-by-case basis.

In November 2020, Neskantaga First Nation evacuated residents and declared a state of emergency due to issues with their drinking water system. In response the province, through the Ontario Clean Water Agency (OCWA) and by request of the community, has been providing technical support onsite to assist in resolving these issues. In addition to this onsite support, the province is also focused on determining, with the community and the federal government, what other supports can be provided to help ensure the long-term sustainability of the drinking water system.

Through the Walkerton Clean Water Centre, Ontario has also been working with First Nations on the development of training programs to support operators, managers and community leaders in maintaining safe drinking water systems. This year, the in-classroom sessions of the Entry Level Training for drinking water operators were impacted by the COVID-19 pandemic but restarted in August, 2020. As of December 2020, 128 individuals had successfully completed the Entry Level Training for drinking water operators, approximately half of whom are from Northern Ontario.

The Ontario Clean Water Agency's (OCWA's) Training Department also offers a full range of technical training in water and wastewater treatment, water distribution, wastewater collection, preventive maintenance, electrical awareness, health and safety and compliance subjects. First Nations operator training services are delivered as part of OCWA's operations and engineering services or through third-party training agreements. In addition to training, OCWA trainers and mentors also provide advice to Chiefs and councils on their water systems. Further information on how OCWA supports First Nation communities' access to safe, sustainable drinking water can be found on the OCWA website (http://www.ocwa.com/what-we-do) .

There is more work to be done to help ensure that First Nation communities in the province can dependably access clean drinking water. Ontario will continue to advocate on behalf of First Nation communities to encourage Indigenous Services Canada, and Health Canada's First Nations and Inuit Health Branch, to develop sustainable drinking water systems and monitoring programs that are consistent with our rigorous provincial standards. Ontario will also continue to reach out to First Nation communities to offer technical support on water and wastewater related challenges that arise as a result of the COVID-19 pandemic.

## Actions to address blue-green algae blooms

Blue-green algal blooms continue to be an issue that people across the province are concerned about, especially during the warmer months. As of December 2, 2020, the ministry confirmed the occurrence of 91 blue-green algal blooms for the 2020 calendar year.

Blue-green algae (also called cyanobacteria) are naturally occurring microscopic organisms that can produce "blooms" in lakes when environmental conditions are favourable. Such conditions exist when there are sufficient levels of nutrients such as phosphorus and nitrogen, warm water temperatures and calm weather conditions.

Some blooms of blue-green algae produce toxins, known as cyanotoxins, that have the potential to harm humans and other animals.

In recent years, there has been an increase in the occurrence of blue-green algal blooms in Ontario. The causes for recent increases in blue-green algal blooms are not fully understood, however, climate change, invasive species and increases in inputs of nutrients (such as phosphorus and nitrogen) are likely contributors. In Ontario water bodies, phosphorus is the leading nutrient of concern that influences how much algae can grow. Increased phosphorus loadings are likely coming from agricultural and stormwater runoff, as well as septic systems. Phosphorus stored in lake bottom sediments may also be contributing.

Ontario has an action plan to address blue-green algal blooms (https://www.ontario.ca/page/blue-green-algae) . Actions in the plan include communicating, engaging, and working with partners; reducing nutrients; improving public awareness about best practices; protecting drinking water sources; supporting science and innovation; and administering legislation, regulations, policies and programs to protect water quality.

The ministry has developed specialized training for ministry staff and comprehensive protocols for responding to occurrences of blue-green algal blooms. Ministry staff are responsible for assessing reports of suspected blue-green algal blooms and determining the appropriate course of action for each occurrence. When a bloom is suspected, the ministry's role is to gather, assess and provide scientific and technical information, as appropriate. For example, if a bloom is suspected, ministry staff take and analyze surface water samples for algal toxins to determine whether a blue-green algal bloom is occurring. The ministry has a protocol in place to help ensure that there is consistent communication, engagement and collaboration with various governmental bodies including local health units, municipal staff, Conservation Authorities and other ministries and federal agencies. Public health agencies are the primary lead for health-related matters, including providing any formal public health messaging such as beach postings related to blue-green algal blooms. Incidents reported to the ministry and confirmed as blue-green algal blooms are tracked by the ministry.

There are also several recent actions that the ministry has taken to help reduce the impacts of blue-green algal blooms:

### Licensing changes to strengthen drinking water protection

Municipal residential drinking water systems are required to proactively monitor their surface water sources for the presence of harmful algal blooms – specifically blooms that are near or may impact their water intake.

Additionally, starting in 2019, the ministry began incorporating requirements for a harmful algal bloom monitoring, sampling and reporting plan into the licences of municipal residential drinking water systems that use surface water (water that comes from lakes, rivers, streams and ponds) as their source. This requirement is being added as licences are renewed and should be incorporated into all licences for systems with a surface water source by the end of 2021.

### New method for analyzing algal toxins levels

The Ministry of the Environment, Conservation and Parks has the only laboratory in Ontario licensed to analyze drinking water and surface water samples for specific types of microcystin, including microcystin-LR (a common type of microcystin which has a drinking water quality standard limit).

The ministry's laboratory has developed a state-of-the-art analytical method to determine specific algal toxin levels in surface and drinking water and report them to public health units in less than 24 hours in case of emergency. The method is the only accredited technique in Ontario to confirm the presence of these toxins.

Ontario will continue its work to better understand and reduce harmful and nuisance algal blooms. You can find more information on these and other Ontario drinking water source and lake protection programs on ontario.ca and in our Made-in-Ontario Environment Plan (https://www.ontario.ca/page/made-in-ontario-environment-plan) . Further information about the Canada-Ontario Lake Erie Action Plan, and updates on additional actions to protect Ontario's water sources including actions to address nutrients such as phosphorus entering the water, are included in the next section of this report.

## Actions to protect water sources

### *Clean Water Act* and source protection plan update

Local source water protection plans are in effect across the 38 source protection areas in Ontario. These plans contain a series of locally developed policies that protect vulnerable areas susceptible to contamination and depletion. Ministries, municipalities, conservation authorities and others have been implementing the policies since 2016 to address various risks to the sources of drinking water.

The annual progress reports for source protection demonstrate that implementation continues to progress across the province:

- The majority of significant risks to drinking water sources identified locally have been addressed through the actions set out in source protection plan policies
- By the end of 2019, 1,171 risk management plans were in place to manage the risk posed by activities such as chemical storage and certain agricultural land uses, occurring on over 1,400 properties
- 263 municipalities had initiated or completed updates to their official plans to conform with source protection plan policies
- Over 1,700 road signs have been installed on both provincial highways and municipal roadways to raise awareness of nearby drinking water sources

Municipalities and conservation authorities have done some great work to protect sources of drinking water. Here are a few recent highlights:

- In Niagara Region, an impressive education and outreach program was undertaken to paint over 300 storm drains and distribute 700 flyers to local residents about the 'Yellow Fish Road Program'.
- By implementing its Salt Optimization Strategy, the City of Barrie reduced the amount of salt used on its roads by 745 tonnes over the 2018-2019 winter season.
- The Quinte Conservation Authority reached over 20,000 people with a drinking water source protection animated video on their Facebook page, raising local awareness of the importance of source protection.

Every year, source protection authorities update the local science-based assessment reports and source protection plans to include new or expanding drinking water systems or to reflect new science. Since 2019, the Minister has approved 16 amendments and 19 orders governing future reviews and updates to these plans as part of our commitment to help ensure Ontario's drinking water sources continue to be protected.

The ministry is also working to continuously improve the source protection program and resources for all Ontarians. To help ensure Ontario's drinking water quality continues to be protected and that source water protection is supported by current science, the ministry is proposing to update the Director's Technical Rules for assessing vulnerability and risks under the *Clean Water Act (https://www.ontario.ca/laws/statute/06c22)*, *2006*. These technical rules are used by source protection authorities and municipalities to help update and implement the assessment reports and source protection plans that protect local drinking water supplies.

The government is committed to giving the people of Ontario the tools they need to protect their drinking water sources. Guidance is being developed to help communities and individuals protect sources of drinking water that are not included in the provincially-approved source protection plans, such as privately-owned drinking water systems. The ministry is engaging a small, representative group of source protection authorities and municipalities to help develop this guidance throughout the fall of 2020.

The Source Protection Information Atlas (https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?site=SourceWaterProtection&viewer=SWPViewer&locale=en-US) is an interactive mapping tool available on ontario.ca that shows the location of over 1,150 municipal drinking water protection zones, and we are proud to continue making more information accessible to the public. In 2019 and 2020 the ministry worked with the Ministry of Natural Resources and Forestry to add real-time climate displays showing river flow, snow depth and air and water temperatures from over 2,800 hydrometric stations. In addition, data from all active permits to take water are also displayed as they are issued.

## Water quantity management initiatives

Ontarians can be confident that efforts to protect water resources in the province are supported by strong laws and policies based on science and evidence, and that there is a continued commitment to be vigilant and prepared to adapt to changing circumstances that could impact drinking water.

### Review of Ontario's water quantity management framework

The province has completed a review of the state of water resources in key areas of Ontario and the effect water takings have on these resources. The review included examining water quantity-related policies and programs as they apply to water takers, including water bottlers taking groundwater. The review also examined how Ontario can continue to manage water takings to help ensure sustainable water resources as our climate changes and population grows.

The ministry's review, which included assessments by independent experts, found that the government's current approach to managing water takings is effective. 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. Links to the findings of the government's review can be found on the Environmental Registry (https://ero.ontario.ca/notice/019-1340).

### Proposed enhancements to Ontario's water taking program

To help ensure the province continues to conserve and manage water resources for future generations, and building on the province's water quantity management review, in June and October the ministry publicly

engaged on proposed enhancements to Ontario's water taking program, including:

- requiring water bottling companies to have the support of their host municipality for new or increased bottled water takings, with an exemption for small businesses
- establishing priorities of water use in the province that can guide water taking decisions
- assessing and managing multiple water takings together in areas of the province where water sustainability is a concern
- making water taking data available to the public to increase transparency of how Ontario manages water resources

More information on proposed enhancements to Ontario's water taking program can be found at Proposal for Updating Ontario's Water Quantity Management Framework (https://ero.ontario.ca/notice/019-1340) . In December 2020, legislation was passed that amends the *Ontario Water Resources Act* to require municipal support for new or increased bottled water takings (https://ero.ontario.ca/notice/019-2422) .

The ministry is also publicly engaging on proposed guidance to help implement proposed enhancements to Ontario's water taking program at Proposed Implementation of Updates to Ontario's Water Quantity Management Framework (https://ero.ontario.ca/notice/019-2017) . The consultation period is open from December 7, 2020 to February 5, 2021.

**Moratorium on new or increased permits to take groundwater for bottled water**

The Taking Ground Water to Produce Bottled Water Regulation (https://www.ontario.ca/laws/regulation/160463) (Ontario Regulation 463/16) established a moratorium on new or increased permits to take groundwater to produce bottled water. In September the province extended this moratorium for up to six months. This extension will give the ministry time to thoroughly review and consider feedback received on our proposed enhancements to Ontario's water taking program. It will also enable us to further engage with the public, stakeholders and Indigenous communities on how we can implement certain aspects of those proposed enhancements before the moratorium ends. The proposal to extend the moratorium was made available for comment on the Environmental Registry (https://ero.ontario.ca/notice/019-2319) from August 28 to September 27, 2020.

## Provincial climate change impact assessment

This August, the ministry selected a consulting team led by the Climate Risk Institute to conduct the province's first-ever multi-sector climate change impact assessment, a key climate change commitment in the province's Made-in-Ontario Environment Plan. The assessment will use the best available science and information to better understand where and how climate change is likely to affect communities, critical infrastructure, economies and the natural environment.

The impact assessment will consider a variety of information sources such as climate data, land use patterns, and socio-economic considerations. It will also consider the views of Indigenous communities, municipalities, the private sector, the public and others to help ensure that the assessment and analysis is robust in providing a thorough understanding of climate change impacts across the province.

Understanding the existing impacts of climate change and identifying potential future impacts will help the province, municipalities, Indigenous communities and other local partners make more informed, timely decisions to keep communities and people healthy and safe.

The final assessment results are expected in 2022.

## Canada-Ontario Lake Erie Action Plan (LEAP)

The goal of the Canada-Ontario Lake Erie Action Plan (LEAP) (https://www.ontario.ca/page/canada-ontario-lake-erie-action-plan) is to reduce the amount of phosphorus that goes into Lake Erie. This will help reduce harmful blue-green algal blooms which can be a risk to drinking water.

The LEAP Implementation Team is responsible for overseeing the successful implementation of the action plan and continues to meet regularly. The Implementation Team includes representatives from provincial and federal agencies and partners (e.g., municipalities, agricultural organizations, conservation authorities, and non-governmental organizations) with actions in the plan, as well as Indigenous communities. Actions associated with the plan include activities to better manage wastewater and stormwater, keep phosphorus on farmland and out of waterways, restore natural heritage features such as wetlands, and improve monitoring and science.

The implementation of the action plan is important for protecting the shared waters of the Great Lakes. The action plan will also help Ontario meet its commitments under the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, and the Made-in-Ontario Environment Plan.

## Great Lakes Local Action Fund

This fall, Ontario announced that it is investing $1.67 million in a new program that provides funding to local projects that have a positive environmental impact on the Great Lakes and/or their tributaries. The fund will provide up to $50,000 for individual projects led by groups such as community-based organizations, environmental non-profits, small businesses, conservation authorities, municipalities and Indigenous communities.

The Great Lakes, the St. Lawrence River, the rivers and streams that feed into the Great Lakes and the rivers that connect them are a source of drinking water to millions of Ontarians. The fund will support projects to protect and restore nearshore, coastal and shoreline areas of the Great Lakes and their rivers and streams.

## Lake Ontario nutrient reduction activities in Bay of Quinte, Hamilton Harbour, and Toronto Waterfront

Several locations along Lake Ontario are particularly vulnerable to nutrient inputs (such as phosphorus), especially in the summer months. These areas include the Bay of Quinte (located in the east), Hamilton Harbour and the Toronto Waterfront (both located in the western basin). Under its Great Lakes Program and in support of the Canada-Ontario Agreement (COA) the ministry has funded several initiatives to reduce the amount of nutrients entering these vulnerable areas. Some of these initiatives include upgrading wastewater treatment plants, inspecting residential septic systems, retrofitting stormwater facilities, helping farmers to implement agricultural best management practices, and training, outreach, and implementation of Low Impact Development, which is a set of practices that reduce the volume of stormwater runoff entering waterways by increasing infiltration of stormwater into the ground at the source. Examples of Low Impact Development include building rain gardens or using permeable pavement.

These initiatives have helped reduce the frequency of blue-green algal blooms, improved water clarity, and improved local drinking water quality in regions where water in-takes are present.

## Pharmaceuticals and other human-use chemicals in the Lake Simcoe watershed

The ministry continues to research, monitor and collaborate on how pharmaceuticals and other chemicals used in every day products, like insect repellant, sunscreen, caffeine and artificial sweeteners, affect our waterways.

These chemicals enter our waters as they are not completely removed during wastewater treatment. For this reason, we have been monitoring for these chemicals in Lake Simcoe, as well as the Great Lakes. Our results indicate that these compounds can be detected at low levels. The ministry will continue to study these compounds as new science becomes available in order to support the overall adaptive management approach of the Lake Simcoe Protection Plan.

## Lake Simcoe Protection Plan 10-year report and legislated review

Ontario released the Minister's 10-Year Report on Lake Simcoe (https://www.ontario.ca/page/ministers-10-year-report-lake-simcoe) in July 2020, highlighting actions taken to implement the Lake Simcoe Protection Plan since 2015, and the progress being made towards the plan's objectives. The report presents scientific monitoring results in a public-friendly format and outlines many of the complex stressors that continue to face the Lake Simcoe watershed.

Ontario and its partners are implementing the Plan by funding research to address knowledge gaps and support innovation; monitoring environmental indicators to track change over time; influencing action on the ground through outreach and partnerships; and sharing information to support evidence-based decision making. After a decade of sustained effort, progress towards long-term objectives is being made, despite the challenges resulting from the considerable population growth in the watershed. Although phosphorus loads have been high in recent years, phosphorus concentrations in the lake have been consistently low. The amount of algae in the lake has also decreased since 2009. Most importantly, improvements are being seen in dissolved oxygen levels in the lake's deep waters, which will help support a self-sustaining cold-water fish community in the long term.

Guided by the principle of adaptive management, the *Lake Simcoe Protection Act (https://www.ontario.ca/laws/statute/08l23)* requires that the Plan be reviewed every 10 years, to determine whether amendments are needed. The lessons learned from Plan implementation to date, and the new information we have gathered through research and monitoring, will inform the review. This winter, the ministry will be inviting all our partners, including the public, to participate in the 10-year review of the Lake Simcoe Protection Plan.

## Muskoka watershed advisory group's report to the minister

The Muskoka Watershed Advisory Group submitted its advice and recommendations (https://www.ontario.ca/page/advisory-group-report-protecting-muskoka-river-watershed) to the minister in June 2020. The report, which is now available online, highlights several top priorities and issues for the Minister's consideration, along with some short, medium and long-term actions and projects to protect the Muskoka River Watershed and support the economy of the region.

The Advisory Group's report was informed by community outreach with over sixty entities, including municipal governments, First Nations and Métis representatives, local organizations, waterpower producers, local agricultural industry and members of the general public.

### Administrative monetary penalties

An administrative monetary penalty (AMP) is a financial penalty the regulator issues to an offender for breaking the law. AMPs are used across government as a quick and effective tool to return the offender to compliance with the law, deter against future non-compliance and help ensure consequences that are proportionate to the contravention.

Ontario's current monetary penalties for environmental contraventions are limited in scope to certain air, land, and water contraventions and to about 140 industrial facilities.

AMPs can help fill the gap where there is non-compliance with the law but where prosecution may not be the most appropriate tool to restore compliance. Using AMPs as part of the ministry's enforcement toolkit does not replace prosecutions. This framework gives the ministry the capacity to pursue the option of imposing immediate penalties in response to contraventions quickly and effectively. Court proceedings may follow, if warranted. A broader use of AMPs would help level the playing field between offenders and those who are acting responsibly and allow the ministry to take strong action against illegal activity, especially for repeat offenders.

The ministry is proposing to expand the use of administrative monetary penalties to uphold the laws that protect our water, air and land. Legislative changes were made in 2019 to allow administrative monetary penalties to be issued under several different environmental laws including the *Safe Drinking Water Act (https://www.ontario.ca/laws/statute/02s32)*, *2002*, and the *Ontario Water Resources Act (https://www.ontario.ca/laws/statute/90o40)*. These legislative changes permit administrative penalty regulations to be made which would allow inspectors to better address violations across the ministry's regulated community – some 150,000 entities across the province. Examples of violations that could be addressed using administrative monetary penalty regulations include:

- illegal dumping of contaminated soil, under the *Environmental Protection Act*
- violating conditions of a permit to take water, or illegal sewage discharges into waterways, under the *Ontario Water Resources Act*
- selling pesticides without a licence, under the *Pesticides Act*
- failure to have a certified operator, under the *Safe Drinking Water Act, 2002*
- violating regulatory setbacks from sensitive features such as wells and surface water, under the *Nutrient Management Act, 2002*

Funds collected through these penalties will support community projects to restore our natural environment, plant trees, clean up shoreline litter, and support other priorities.

The ministry is doing further planning and consultation with stakeholders and the public to establish how the penalties will work and looks forward to implementing them through regulations in the future.

## Conclusion

In 2020 people around the world were reminded not to take their health for granted.

Throughout the uncertainty and instability that the COVID-19 pandemic has created the ministry's top priority has been to protect human health and the environment. We continue to work to help ensure continued access to water services and to clean, safe drinking water for all Ontarians and continue to work collaboratively with other ministries to help address any COVID-19 related challenges. We will continue this work to help ensure that water system owners and operators, schools, daycares, businesses, individuals, other stakeholders and First Nations have the supports that they need to play their part in the continued delivery of safe drinking water and water services.

Throughout the pandemic, Ontarians have worked collectively to stop the spread of COVID-19 and help ensure our most vulnerable citizens are protected. We have risen to the unprecedented challenges of the pandemic and together, we will continue to support and keep safe individuals, families and businesses across this great province.

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