Risk Considerations

Peel Region is committed to quality service, ensuring consistent supply of safe drinking water to its communities while protecting the natural environment.

Staff implement initiatives and build programs that involve a multi-layer coverage of processes and practices in the operation of Peel's drinking water systems, that effectively monitor and manage the existing and potential risks.

1. Effective Management and Oversight of Drinking Water Systems

Drinking Water Quality Management System & Continual Improvement

Peel Region's drinking water systems have been operating in conformance to the Ontario Drinking Water Quality Management Standard (DWQMS), as required by legislation, and maintaining their DWQMS accreditation status through annual third-party verification audits. These regular checks confirm Region's system performance with focus on the maintenance of water infrastructure, monitoring of water quality, identification of potential risks and risk mitigation strategies including security, water treatment, and the impacts of climate change.

Peel's Drinking Water Quality Management System requires regular risk assessments and the implementation of effective application and verification of control measures. Staff use annual inspections by the Ministry of the Environment, Conservation and Parks (Ministry) and in-house compliance checks as well as regular internal audits of the quality management system as mechanisms that identify opportunities for improvement and to address existing vulnerability.

Every year, staff completes a review of risks to the delivery of safe drinking water and assesses the adequacy of control measures that strengthen our water systems' capacity to prevent, mitigate, prepare for, and respond to emergencies. Also, staff review the overall performance of the water systems during the annual Management Review, which aims to assess the effectiveness of quality management, and the need for change of existing strategies.

Maintenance of Municipal Drinking Water Licence

A Municipal Drinking Water Licence to operate a drinking water system in Ontario must be renewed every five years. Peel Region's Licences are due to expire in November 2024 and staff have been preparing the renewal applications.

The renewal of the Licences requires the submission of a Financial Plan, projecting Peel Region's water systems financial outlook and sustainability for the six-year period spanning 2024 to 2029. The Financial Plan must receive Council approval through a formal resolution and submitted to the Ministry of Municipal Affairs and Housing by May 7, 2024. Staff prepared the Financial Report Number 009-301A for Regional Council approval through a report titled MUNICIPAL DRINKING WATER LICENCE RENEWAL AND UPDATE TO FINANCIAL PLAN presented to Council on March 21, 2024.

2. Lead in Drinking Water

Peel Region's drinking water has consistently low levels of lead. Following the regulatory requirements, staff test drinking water twice a year in the distribution system and at private taps (inside homes and businesses). For each sampling round, staff prepare a lead

monitoring plan that focuses on high-risk areas known or likely to have lead service lines based on the age of buildings and water assets.

Test results are normally well below the acceptable lead level of 10 micrograms per litre (parts per billion). In 2023, samples were collected from taps at private homes and non-residential buildings as well as from the water distribution system, as required. Peel's water supply samples tested well within the Ontario drinking water quality standard, whilst one private tap sample tested just above the limit. More details on 2023 sampling data can be found in the 2023 Water Quality Reports available on Peel Region's website.

A summary of results from the last 13 years of testing for lead is presented in the below table and confirms quality water supply.

Lead Testing Results 2012 – 2023

Drinking Water System	Distribution System Numbers			Private Tap Numbers *		
	Samples Collected	Exceedances		Samples Collected	Exceedances	
		#	%		#	%
South Peel (Mississauga, Brampton, Bolton & South Caledon)	384	2	0.52%	1,100	12	1.1%
Cheltenham	16	0	-	NA	NA	NA
Caledon Village – Alton	21	0	-	NA	NA	NA
Inglewood	14	0	-	NA	NA	NA
Palgrave – Caledon East	42	0	-	NA	NA	NA

* Caledon groundwater systems are exempted from sampling private plumbing based on excellent results in the early years of the program

Lead is found in drinking water usually because of leaching from pipes made of lead or with lead fittings or welds. The use of lead plumbing was phased out throughout the 1970s and 1980s, leaving older homes and buildings at the highest risk of having lead plumbing. These older neighbourhoods may also have municipal service pipes, pipes between a municipal watermain and private property line, that contain lead.

Staff investigate drinking water test results that exceed the acceptable limit, verifying the municipal service pipe material and immediately replacing it if it is lead or contains lead. If a private water service pipe is found to be made from lead, Public Health staff assess the risks and encourage the property owner to replace the private plumbing or employ measures to reduce the lead levels at their tap. If a lead-based municipal service pipe is discovered during watermain replacement work, it is replaced up to the private property line and the property owner is encouraged to replace their private water service.

Many communities throughout North America are proactively removing all lead pipes from their water systems. In the interest of eliminating sources of lead in the Region's drinking water, staff in Water Services and Public Health are collaborating to create an inventory of all lead services throughout Peel Region and develop a plan to mitigate the risk and champion lead pipe removal program. This is anticipated to be a multi-year project that will require engagement of local communities and significant funding.

Peel has allocated resources required to meet our commitment to reduce exposure to lead in drinking water through the State of Good Repair program, with rate reserves funding available to assist to protect public health and to support communities in Peel.

3. Water Sector Cybersecurity

Safety of drinking water and protection of public health depends largely on the water system vulnerability to a variety of hazardous events, including natural disasters, equipment failure and other circumstances that can result in contamination or interruption to water supply. In the last couple of years, the threat to cybersecurity has become a priority to the industry and water system operating authorities.

Review of municipal water system cyber resilience is expected through the mandates of the Ontario Drinking Water Quality Management Standard, including implementation of measures that improve cyber-defence of water infrastructure assets and reduce the risk of these threats compromising our ability to provide high-quality water to customers.

In 2023, staff implemented several improvements to the water and wastewater process control and automation systems to reduce the risk. Details of the improvements can be shared with Council in camera as this is sensitive information regarding the security of a critical part of water and wastewater operations.

4. Source Protection and Climate Change Adaptation

Climate variability and the increasing changes in temperature and rainfall patterns (climate change) has been identified as a potential threat to drinking water quality, supply, and the environment. Climate change has been prescribed under Ontario drinking water legislation and, through the annual risk assessment, staff review its potential impacts on Peel's delivery of water services. This activity informs opportunities to implement control measures within existing systems and engineer solutions into future project designs.

Source Water Protection

Rise in temperature and precipitation and increased run-off of nutrients can stimulate the frequency and extent of algae blooms in Lake Ontario. Through source water protection and drinking water quality tracking programs, Peel has established a Harmful Algal Bloom Monitoring and Response Plan, which is reviewed and updated by staff annually.

The established Credit Valley-Toronto and Region – Central Lake Ontario Source Protection Plan (Source Protection Plan) identifies intake protection zones around our lake-based water treatment plants, and protection areas near our municipal wells. Peel Region's Risk Management Office performs inspections to identify and mitigate risks related to land use within these areas, with the interest of protecting sources of our municipal drinking water supplies. Staff continue with the administration of a well abandonment program that funds the safe decommissioning of private wells that are no longer in active use, to eliminate potential sources of surface contamination into groundwater aquifers.

In support of the Source Protection Plan implementation, Peel staff are part of the Lake Ontario Collaborative Group, together with City of Toronto and Durham Region, where

information and best practices are shared, joint initiatives are undertaken, and, through which, occurrences of potential risks to source water are communicated.

Lake Ontario Water Quality Forecasting System

One of the jointly implemented projects is the Lake Ontario Water Quality Forecasting System, which uses weather conditions and data from continuous monitoring equipment in Lake Ontario to predict the direction, depth and spread of a contaminant in the lake and its potential to impact water treatment plant intakes over time. This new tool provides information for staff to make informed decisions on response level and duration of monitoring regarding spills into Lake Ontario. In 2023, staff updated Peel's internal procedures to include direction on the use of this new tool. Additionally, Peel staff are actively involved in a cross-boundary panel to assist users of this forecasting tool and to establish effective guidance materials and inter-municipal communication in response to spill incidents.

Sensors installed at the lake water intakes to our water treatment plants in 2022 provide real-time monitoring data. Once calibrated with the laboratory results, sensor data will be used to set action triggers to mitigate treatment process upsets and ultimately protect the quality of treated water. This calibration effort will continue into 2024.

5. Contaminants of Emerging Concern

Research along with advancements in water testing technology in recent years have raised awareness of contaminants of emerging concern and their impacts on the environment and human health. Examples include microplastics and per- and poly-fluoroalkyl substances (PFAS), which are not currently regulated nor included in the Ontario monitoring requirements for drinking water systems. In March 2023, Health Canada released a proposed Total PFAS limit in Canadian drinking waters. Peel commented on the public consultation of this proposal and evaluated its voluntary monitoring program and results to determine impact of the proposed limit to Peel. It should be noted that when the government takes next steps to introduce new regulations around PFAS limits or controls, there is a potential for significant capital funding impacts for water and wastewater treatment, requiring new technologies and advanced instrumentation.

Samples from Peel Region's water and wastewater systems are monitored for select contaminants of emerging concern and staff participate in research studies with universities and governing agencies to understand the prevalence, impact, and removal methods of these compounds. Peel Region utilizes many treatment technologies that have been found effective in reducing concentrations of many of these contaminants. To gain better understanding, regular monitoring of contaminants of emerging concern will be included in the development of a 5-year Water and Wastewater Quality Management and Optimization Plan, which will be used to plan future sampling studies and improve our processes and practices. Staff are continuing their work on this important Plan in 2024.

6. Aging Infrastructure

Peel Region's overall infrastructure is aging, requiring more investment in preventive and planned maintenance. Staff has established a comprehensive asset management program,

which includes infrastructure assessment and renewal on an ongoing basis to ensure long term integrity.

The watermain replacement and rehabilitation program that involves repair or replacement of existing water pipes is ongoing. Also, water system extension and upsizing are considered to meet future planning needs. The majority of the watermain replacement projects are undertaken in partnership and coordination with road re-construction and sanitary sewer renewal projects for improved cost effectiveness and to minimize public inconvenience. Staff plans this program in a financially responsible manner and allocates funding each year. To ensure financial sustainability, staff also prepare a long-term financial plan that considers investments required to maintain the State of Good Repair program for infrastructure renewal and rehabilitation.

7. Backflow Prevention

Peel Region's Backflow Prevention By-law ensures the protection of our drinking water by preventing water from private water systems or premise plumbing from entering our municipal drinking water systems during a drop in pressure in the water distribution system.

Peel staff conduct surveys at private facilities to identify cross connections, between a potable water supply and any source of contamination and determine if backflow prevention devices are required. All backflow devices must also be tested every year by qualified persons and the test reports submitted to Peel Region.

Conclusion

Disruptions in the service delivery or impact to water quality and public health may result from emergencies or challenges with adaptation to environmental changes.

Through consideration of potential hazards and risks, like those summarized above, Peel staff regularly identifies and prioritizes vulnerabilities of our drinking water systems, building culture of preparedness to potential threats and emergency situations.