



FINAL REPORT

Water and Wastewater Utility Management Responses to the COVID-19 Pandemic

Canadian Municipal Water Consortium Strategic Sharing Group



March 20 to July 24, 2020

Strategic Sharing Group – Summary of Insights

Water and Wastewater Utility Management Responses to the COVID-19 Pandemic

Municipalities and their utilities are responsible for providing essential water and wastewater services for communities across Canada. This service becomes even more critical during a public health crisis like the COVID-19 pandemic.

In the first few months of the pandemic, Canada's rapidly evolving situation and high level of uncertainty challenged business-as-usual for many water and wastewater utilities. This resulted in a number of modifications to staffing and operations, as well as the prioritization of activities, including maintenance and construction projects. Protecting the health and safety of field and operations staff while

also delivering safe drinking water and reliable wastewater treatment to Canada's communities was paramount in the early days of the pandemic. This also remains a critical priority as municipalities across the country emerge from lockdown into a new reality.

Canada undertook strict physical distancing measures and other precautions in response to the COVID-19 pandemic in mid-March 2020. The severity of outbreak varied in different parts of the country; by May 1, the number of COVID-19 infections in some regions had peaked, while other regions began to see a rise in cases again as local economies began to re-open.¹ Although provinces are now continuing to loosen restrictions, they are proceeding with great caution and will re-introduce restrictions if necessary.

When the Public Health Agency of Canada initially started advising Canadians to practice physical distancing and work from home wherever possible, the City of Calgary approached Canadian Water Network (CWN) to host a peer sharing call through the Canadian Municipal Water Consortium. We reached out to the Consortium's leadership group, who quickly agreed that there was a need to exchange knowledge and best practices with other utilities as they responded to the crisis.

The timely exchange of approaches and best practices by members of the Canadian Municipal Water Consortium has supported rapid learning and adaptation to the COVID-19 crisis.

¹ www.macleans.ca/society/health/coronavirus-in-canada-these-charts-show-how-our-fight-to-flatten-the-curve-is-going

Canadian Water Network's 
Canadian Municipal Water Consortium

Since March 20, 2020, CWN has hosted and facilitated weekly discussions with up to 48 decision makers from up to 30 large and mid-sized water and wastewater utilities across Canada. These discussions have helped utility leaders plan, prioritize and respond to the pandemic to ensure continuity of services, while also protecting the health and safety of staff. Initially, the meetings were to support members of the Canadian Municipal Water Consortium's leadership group. However, given the unprecedented situation and the clear benefit to others outside the network, CWN opened the discussions to other municipalities, with the goal of providing support to the broader municipal community. The calls concluded on July 24, 2020 with the understanding that CWN would reconvene the group if there are subsequent waves of the pandemic.

The meetings were modelled on CWN's prior Strategic Sharing Groups for the Canadian Municipal Water Consortium, which provide meaningful peer-to-peer sharing opportunities on emerging strategic issues. CWN facilitates an environment for confidential dialogue among participating senior municipal/utility managers, and where appropriate, invites leading experts to share their knowledge. The discussion is directed by the group, with support from CWN staff who frame the issue, facilitate discussions, invite relevant expert guests, incorporate insights from the international community, create meeting captures and use critical takeaways to shape future Consortium initiatives to support the municipal community.

This document replaces an earlier document which was published in April 2020 and provides further insights from subsequent meetings. While not representative of all water, wastewater and stormwater utilities in Canada, it provides an important snapshot of some of the challenges, considerations and strategies employed during this time period. There were a number of common challenges that senior utility leaders encountered during the COVID-19 pandemic and the discussion topics varied over the 19-week time period (see Table 1). Over 19 weeks, the sharing of information and best practices evolved from response to proactive planning for scaling up following the lockdown, as well as considerations for responding to future resurgence of the virus and future contingency planning.

Table 1: Overview of Strategic Sharing Group Discussion Topics

Click on the headings below to jump to key insights on a specific topic.

<p>Business continuity planning</p> <p>Prioritization of operational and capital work, adopting more efficient operations and processes, supply chains for chemicals and personal protective equipment (PPE), staffing and contingency planning — including shelter-at-home and shelter-at-work, ongoing maintenance, service delivery and cost reductions.</p>
<p>Protecting the workforce & implementing modified working arrangements</p> <p>Internal communication, alternate work arrangements, IT challenges for staff working from home, worker safety protocols, return-to-work plans and protocols, logistics of physical distancing, job security and compensation effective change management, and health screening.</p>
<p>Financial relief for customers and revenue impact forecasting</p> <p>Customer payment deferral, reduced rates, reconnection of disconnected water services, declining water consumption, changing demand patterns, changing peak times, revenue impacts and forecasting, and delayed capital projects.</p>
<p>Public communications</p> <p>Perception of continued work in the community, non-flushables causing clogging issues and safety.</p>
<p>Collaboration with key stakeholders</p> <p>Unions, suppliers, municipal Emergency Operations Centres, provincial regulators and public health units.</p>
<p>Regulatory guidance and relief</p> <p>Essential service designation, operator qualifications and training, sampling requirements, guidance on health and safety protocols and construction activities, and wastewater-based epidemiology for SARS-CoV-2.</p>
<p>Considerations for resuming operations</p> <p>Return-to-work planning, ongoing staff training, recommissioning building water systems after an extended period of non-use, and coordination with public health.</p>
<p>Predicting and responding to future waves of COVID-19</p> <p>Wastewater surveillance of COVID-19, and recovery and retraction scenarios/plans.</p>
<p>Looking ahead</p> <p>Reprioritization, financial impacts, alternative service delivery methods, re-evaluating levels of service, stimulus funding, organizational agility and operating within a new reality.</p>

Table 2: Strategic Sharing Group discussion topics by date

Discussion Topic	March 20	March 27	April 3	April 9	April 17	April 24	May 8	May 22	June 12	July 24
Business continuity planning										
Protecting the workforce										
Modified working arrangements										
Revenue impact forecasting										
Considerations for resuming operations										
Financial relief for customers										
Public communications										
Internal communications										
Regulatory guidance and relief										
Collaboration with key stakeholders										
Predicting/responding to future waves										
Stimulus funding										

Business continuity planning

During the first weeks of the pandemic, utilities participating in the COVID-19 Strategic Sharing Group focused on the **prioritization of essential and non-essential work** to determine whether to continue, scale back or defer projects to protect worker health and safety — including capital works construction, preventative maintenance, customer engagement and sampling. In July, municipalities that scaled back on non-essential services resumed, or resumed with modified

protocols such as contact tracing, strict PPE, and COVID-19 screening questions for customers (e.g. when a service appointment is booked, 1 day prior to the appointment and when a utility representative is onsite).

From March to early May, most **utilities ceased all work that would interrupt water supplies or necessitate plant shut-downs**. Provincially, initial responses varied regarding the continuance of construction projects across the country, dictated largely by provincial direction, as well as concern from contractors, third-party suppliers and the public around the risk of continuing to work. Some utilities continued capital works and maintenance programs with increased safety precautions. Other utilities reduced their activities, continuing only with those projects that were deemed essential to maintaining service levels.

As economies across the country began to re-open and some services resumed from May to July, the discussion shifted to **reprioritizing shelved capital projects and re-evaluating levels of service**. Equity and affordability considerations were an important part of this discussion. During this time period, many utilities opted to hold off on resuming pre-pandemic business-as-usual operations. Discussion instead focused on **identifying how processes and service delivery methods could be changed** and what **new procedures could be adopted to reduce costs** moving forward, such as Artificial Intelligence (AI), machine-based learning, advanced metering infrastructure (AMI) and collaboration.

Challenges in securing PPE have persisted throughout the pandemic. Initially, municipalities began to manufacture their own disinfectant using treatment chemicals. The focus quickly shifted to obtaining appropriate PPE for a variety of work situations. Hand sanitizer, gloves, disinfection wipes and proper masks were not always available in the volume required. Some utilities used mask sterilizers and washable fabric neck gaiters in lieu of disposable face masks to help bridge the gap.

The **availability of water and wastewater treatment chemicals and equipment** was initially not a concern. As the pandemic continued, supplies of ferric chloride dwindled due to a decrease in industrial activity, which prompted some utilities to consider switching to ferrous sulphate for wastewater and drinking water treatment.

Many of the utilities participating in the sharing group calls **inventoried staff skills to inform staff contingency planning** to backfill critical roles in the event of a reduced workforce. In mid-March, some provincial emergency orders (e.g. O. Reg 410/20) provided greater flexibility with regard to who is permitted to operate facilities. In some provinces, the regulatory requirements for water and wastewater utilities were eased on a case-by-case basis. In more advanced stages of re-

opening, utilities began discussing the need to safely **bring operations staff back to resume critical maintenance activities** of treatment plants and systems.

Shelter-at-work planning, where workers quarantine at critical facilities to maintain operations, was considered by a number of municipalities during the pandemic. In late March, one Canadian community implemented shelter-at-work at their water treatment plant. Some of the planning considerations that utilities considered included establishing trigger points for implementation, worker health and safety precautions, accommodations and amenities, as well as compensation and incentives. Most utilities in the Strategic Sharing Group included shelter-at-work options in their contingency planning but opted to implement **operators sheltering-at-home** instead.

Protecting the workforce and implementing modified working arrangements

Effective and **timely communication with staff** during the early stages of the pandemic was critical. Utilities quickly mobilized to provide clear guidance on evolving health and safety protocols, while also addressing staff questions and anxiety, IT issues, family needs and mental health issues. Some of the tools they employed included regular messaging from leadership and staff appreciation campaigns.

Most utilities participating in the Strategic Sharing Group introduced **alternate working arrangements** to support physical distancing, such as office staff working from home, significantly reducing the number of workers in the field and at treatment facilities, staggering shifts, creating separate teams, separating skillsets, assigning dedicated facilities, reviewing remote operating capabilities and health screening prior to entering facilities or work sites. There were **IT challenges related to working from home**, but most utilities observed that office staff working from home maintained **high productivity**. At the final peer sharing call (July 24), most utilities reported plans to keep office staff working from home over the coming months.

Worker safety protocols implemented by utilities have included **health screening, increased disinfection** of workspaces, **physical distancing, PPE**, and providing washroom/hand-washing **facilities for field staff**. During the initial phase of the pandemic, many municipalities participating in the peer sharing calls also **minimized home visits**. Approaches to safe working protocols have been refined over time as new information becomes available.

There were ongoing concerns related to **return-to-work protocols for sick employees** or those who live in a household under quarantine. In addition to following provincial or local public health guidelines, some utilities customized their policies. To date, there have been few isolated cases of COVID-19 among the staff of utilities participating on the sharing calls.

Once phased provincial re-opening enabled staff to return to work, utilities focused on the **logistics of physical distancing in workspaces**. This included how to get staff to worksites (vehicles) and enabling safe access to communal spaces such as washrooms, lockers and lunch rooms. While most utilities have been reviewing options to redesign office workspaces to accommodate physical distancing, where possible, utilities will keep office staff working from home to reduce risk and limit costly workspace adaptations.

As municipalities and utilities emerge from the pandemic lockdown, they have been working closely with public health units to develop **return-to-work plans for employees** (administrative, construction and maintenance and operations) that ensure physical distancing and protect the health and safety of all workers. These plans include risk profiles/assessments to determine which staff to bring on-site first, and to what extent, as well as a phased return, staggered shifts and cross-divisional collaboration in scheduling.

As staff began to return to office and field environments in May and June, some utilities participating in the strategic sharing group were concerned about potential complacency regarding the consistent and effective use of PPE. In response, communications with staff included explicit guidelines on PPE protocols, daily surveys, signage and frequent reminders on the 'who, what, where, how and why' of PPE.

Throughout the pandemic, **job security and compensation** has largely been maintained by most utilities participating in the Strategic Sharing Group, despite changes to staffing and schedules. Staff who couldn't work from home were asked to rotate shifts weekly or bi-weekly, alternating between field or plant operations and sheltering-at-home while on call. Utilities initially re-evaluated their ability to hire **seasonal staff and summer students**, but as municipalities navigate re-opening, some of these staff have gradually been brought back.

[Financial relief for customers and revenue impact forecasting](#)

Most utilities participating in the Strategic Sharing Group provided financial relief for customers, including **payment deferral, reduced rates, waived fees and reconnection of disconnected water services**. As regions emerged from the lockdown, some municipalities, particularly in Eastern Canada, also began discussing extended customer relief in the wake of COVID-19. One municipality is now offering a bill deferral program with instalment plans to eligible customers.

In the early days of the pandemic, most utilities participating in the Strategic Sharing Group were experiencing or projecting a modest **decline in overall water consumption** and **shifting demand patterns**, including the location of demands. Although there has been some variation depending

on the type of industries operating within a municipality, ICI consumption (industrial commercial and institutional) generally decreased during the pandemic as airports and schools closed and the retail and hospitality sector shutdown. Utilities reported an **increase in residential consumption** and **shift in peak demand times**. In some communities, morning peak times occurred later in the day, likely due to people working from home.

Water use data was being used by utilities to project **revenue impacts** in the early to middle phases of the pandemic. Several utilities noted that the increase in residential consumption did not offset the corresponding decrease in ICI consumption, so revenues were projected to decline. In some regions, particularly in British Columbia, demand changes were reported as minimal, largely because the number of COVID-19 cases in communities peaked earlier than other regions across Canada so the local economy and degree of economic shutdown was not as heavily felt. Municipalities that went ahead with planned rate increases noted that this action helped reduce the impact of revenue declines resulting from the pandemic. Municipalities that initially put a hold on planned rate increases during the early stages of the pandemic have since decided to proceed in late 2020 or early 2021.

In the early phases of the pandemic, utility **revenue forecasting** focused on assessing the impacts of shifting/changing patterns of water use relative to rate structures and metering, deferred customer payments, reduced worker output and delayed capital works projects. Utilities participating in the Strategic Sharing Group expected that revenues and the timing of capital works and other programs would be impacted. In late May, almost half of the Strategic Sharing Group participants felt that the financial scale of impact was still unknown, although 10% of the group felt that it was not significant. The remaining participants felt that the impact was somewhat significant or very significant. At the time of the final meeting (July 24), some of the participating municipalities noted that various factors have helped shore up some of the projected revenue losses, such as dry weather in southern Ontario leading to increased water consumption for residential gardening.

To account for the anticipated loss of revenue, many utilities began **prioritizing the deferral of capital works**. In some cases, municipalities identified the need to safely bring more operations staff back to work for preventative maintenance to avoid future financial impacts due to deteriorating infrastructure.

Public communications

The **safety of public drinking water** was not a widespread public concern during the pandemic. As researchers began indicating that they were able to find fragments of the SARS-CoV2 virus in wastewater, the utilities participating in the sharing group utilities initially conjectured that the public might question the health and safety of streams and lakes receiving treated wastewater effluent. Subsequent research indicated that the viral fragments were non-infective and public concern was not heightened.

Initially, the **public was slow to recognize the essential nature of water services**, including maintenance by workers in the field and construction workers. Although the designation of city and provincial states of emergencies provided practical support, public understanding of the importance of construction-related work remained low. To overcome this challenge, several utilities enlisted local community leaders such as mayors and city councillors to share public messages about the need for this work to continue.

At the beginning of the pandemic, many municipalities participating in the Strategic Sharing Group introduced or reinvigorated public communications campaigns on **non-flushable products and appropriate sewer use**. Some utilities reported that residents were flushing disinfectant wipes, disposable gloves and 'flushable' bathroom wipes into sanitary systems, which led to increased clogging.

Collaboration with key stakeholders

Water and wastewater utility leaders across Canada have benefited from CWN's Strategic Sharing Group meetings by **sharing knowledge about their responses to COVID-19**. The quality of the discussion has been extremely valuable and responsive because of the deep level of experience and expertise of the meeting participants, who were able to share their insights in a trusted, confidential space. Sharing among direct neighbours has occurred in an ad hoc manner and has highlighted room for improvement for mutual aid agreement frameworks across Canada.

Cooperation and collaboration with key stakeholders has been critical in ensuring business continuity in some communities. Most of the utilities participating in the sharing group collaborated over the course of the pandemic with local unions, Emergency Operations Centres (EOCs), suppliers, contractors and provincial regulators. EOCs were key partners in coordinating PPE supplies, supporting coordinated decision-making and raising awareness on key issues regarding continuity of services.

Regulatory guidance and relief

Regulatory relief and guidance from provincial authorities has been varied. Generally, the participants in the Strategic Sharing group noted that they would have preferred more guidance. Utility managers have primarily focused on obtaining relief and guidance on:

- Operator qualifications to create redundancy of critical staff
- Water quality sampling to support skeletal staffing for priority tasks
- Operator training requirements, given the limited courses available during the shutdown
- Designation of water and wastewater as essential services, in part to gain access to prioritized COVID-19 testing and daycare
- The continuation of construction projects
- Health and safety practices and return-to-work policies
- Standardized guidelines on wastewater epidemiology sampling and testing

As municipalities and utilities emerge from the lockdown and move ahead with capital projects, there is a desire for provincial and federal governments to **streamline and modernize regulations** such as environmental assessment requirements to more effectively advance projects and support economic recovery.

Considerations for resuming operations

Many participants thought that scaling back up from lockdown would prove to be more challenging than shutting down. Once utilities began to scale up operations, discussion in the sharing group focused on developing **return-to-work plans** that addressed:

- Prioritization of core functions, maintenance, and construction
- Risk assessments to determine which staff to bring back (and when) during a phased re-introduction
- Actions to ensure worker safety such as PPE, physical distancing, and health screening protocols

Continuing staff training remains a challenge for some utilities. Many of the utilities participating in the calls are exploring **options to conduct staff training safely**, such as safe in-person training or online integration of some training program elements. Utilities impacted by the pandemic are also exploring longer-term changes to increase efficiency in training.

In response to ongoing concerns regarding changing water-use demands as a result of the pandemic, Canadian Water Network brought in guest experts to share their expertise regarding

the management of stagnant water within a water distribution system. Water quality experts raised concerns about elevated levels of lead, the potential for *Legionella* infections and sewer gas accumulation in stagnant water systems. These experts also highlighted a number of challenges to addressing these concerns and the need to clearly communicate with private and public building owners across the country about **how to safely re-open buildings following an extended period of non-use**.

Some utilities implemented flushing programs to manage stagnant water and maintain disinfection residuals within the distribution system. Some municipalities also increased the chlorine dosage in drinking water treatment to ensure water quality was maintained at the tap.

Most utilities attending the Strategic Sharing Group calls expressed a need for greater provincial guidance on this issue, including standardized testing guidelines and flushing requirements. In Quebec, for instance, provincial guidelines were developed to help restore services to water distribution systems after prolonged stagnation.

In the absence of a provincially mandated re-opening approach, many municipalities/utilities created their own re-commissioning documents and guidelines. Several challenges related to this issue were identified by the participating utilities during the Strategic Sharing Group discussion:

- A need for evidence-based testing guidelines and flushing requirements
- A need for utilities to prioritize and coordinate the flushing of buildings to manage peak water demands and sewer capacity
- Lack of clarity on who was responsible for communicating with building owners about public health risks and mitigation procedures (e.g., federal/provincial government, plumbing associations, municipalities)
- Customer billing concerns about who pays for flushing

[Predicting and responding to future waves of COVID-19](#)

In late April, CWN created a national [COVID-19 Wastewater Coalition](#) of municipal utilities, researchers, laboratories and government. CWN shared information with utilities participating in the Strategic Sharing Group calls about the potential for **wastewater-based epidemiology to predict future waves of community infection**. Many municipalities/utilities in the Strategic Sharing Group expressed the desire to learn more about this evolving research, including best practices, standardization and how they could both contribute to and benefit from this national collaborative effort. Since then, several municipalities and utilities signed on to the Coalition and many others are following the progress of WBE activities in Canada with great interest. Most of

the effort for SARS-CoV2 wastewater surveillance is centred at several academic research laboratories across the country working with their local municipality or utility. A national inter-laboratory study was completed in August 2020 with the goal of developing a consensus method for detecting SARS-CoV2 in wastewater that could be used to support a national surveillance network.

Concern remains for potential future waves of the pandemic. As a result, many of the participating utilities have developed **recovery and retraction scenarios/plans** that include trigger points. However, utilities participating in the final sharing group calls expressed a general consensus that going back into lockdown would not pose as much of a challenge the second time around. There was some discussion about the possibility of a future wave of COVID-19 overlapping with cold and flu season and how this might impact utility operations and work capacity.

Looking ahead

As phased re-opening continues, many utilities are **reprioritizing projects** as they scale back up. Capital works are being delayed in some municipalities to recoup losses incurred during the pandemic. In municipalities that did not scale down, capital programs are generally proceeding unabated. Other municipalities are relying on stimulus funding to push forward with planned capital works. Municipalities and utilities are currently in the process of forecasting the short- and long-term **financial impacts** of COVID-19; many of them are anticipating that adjustments will be needed for 2020-2021 capital plans and programs due to reduced revenue. Accounting for the role water infrastructure projects may play in government **economic stimulus** programs is also an emerging consideration as re-opening plans continue to be developed.

Looking ahead, the impacts of the COVID-19 pandemic will continue to influence and change utility operations and business decisions. The COVID-19 pandemic has required utilities to adapt quickly and introduce alternative business practices. **Agility** will continue to be a critical factor in successfully emerging from the pandemic. Although it's still too early to draw conclusions about lessons learned, new approaches during the pandemic regarding prioritization, staffing, internal communication, employee mental health and well-being, setting service levels, emergency preparedness, customer engagement and financial management will inform **municipal water management in a new reality**. CWN will continue to work with municipalities and utilities to help accelerate, advance and improve water management decisions.