Online Resources for Canadian Water and Wastewater Utilities during the COVID-19 Pandemic

Canadian Water Network has curated a collection of online resources for utility managers during the COVID-19 pandemic. This list will be updated weekly – please refer to the date in the footer. For each weekly update, new resources will be added to the bottom of the section under which they are filed and presented in red font. If you have additional resources that would be useful for this audience, please forward them to Dalia Al-Ali, Senior Project Manager at dalali@cwn-rce.ca.

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Scientific Information on SARS-COV-2 for Water and Wastewater Managers

These fact sheets and web portals have been written for water and wastewater managers. They reference the latest available science regarding the SARS-COV-2 virus in conventional drinking water and wastewater treatment and include information on public health and safety, best management practices and worker protection.

Information on SARS-COV-2 Infectivity and Exposure in Water/Wastewater

- World Health Organization

- Global Water Research Coalition
  COVID-19 Virus Water, Sanitation and Wastewater Management (March 10, 2020)

- Water Services Association of Australia
  COVID-19 (March 11, 2020)

- Water Research Australia
  SARS-CoV-2 Water and Sanitation (March 5, 2020)

- U.S. Centers for Disease Control and Prevention (CDC)
  Water Transmission and COVID-19 | Drinking Water, Recreational Water & Wastewater: What You Need to Know (Updated April 23, 2020)

- Stantec
  Coronavirus White Paper (March 19, 2020)

- Water Research Foundation
  Coronavirus Research Update webinar (March 12, 2020)
  [https://www.waterrf.org/resource/coronavirus-research-update](https://www.waterrf.org/resource/coronavirus-research-update)
International Ultraviolet Association
Fact Sheet on UV Disinfection for COVID-19
http://www.iuva.org/COVID-19

Canadian Water and Wastewater Association
Technical Resources
https://cwwa.ca/covid-19/

COVID-19 Waterblog
Current science on the fate and potential transmission of SARS-CoV-2 in water
https://covid19waterblog.wordpress.com/

Water Research Foundation
Webinar: Latest Coronavirus Research Update (April 16, 2020)
https://www.waterrf.org/event/latest-coronavirus-research-update

Water Services Association of Australia
Fact Sheet: COVID-19 and Wastewater (April 15, 2020)

La Rosa, G., Bonadonna, L., Lucentini, L., Kenmoe, S., Suffredini, E.
Coronavirus in Water Environments: Occurrence, Persistence and Concentration Methods – A Scoping Review

Carducci, A., Federigi, I., Liu, D., Thompson, J., Verani, M.

Information on SARS-COV-2 Wastewater Surveillance Research and Initiatives

KWR Water Research Institute
Presence of SARS-CoV-2 in Sewage (March 30, 2020)
https://www.medrxiv.org/content/10.1101/2020.03.29.20045880v1

Water Research Foundation
https://www.waterrf.org/news/water-research-foundation-host-virtual-international-water-research-summit-environmental

Water Research Foundation
Canadian Water Network’s
Canadian Municipal Water Consortium


- KWR Water Research Institute
  Q&A Portal on COVID-19 Sewage Surveillance

- International Water Association
  Press Release: COVID-19 Task Force
  https://iwa-network.org/groups/covid-19-task-force/

- Water Research Australia
  Monitoring COVID-19 Virus Presence and Persistence in the Australian Sewage Networks

- Australian Academy of Science
  Monitoring Wastewater to Detect COVID-19

- Eawag: Swiss Federal Institute of Aquatic Science and Technology
  Tracking the Course of the COVID-19 Pandemic in Wastewater

- Canadian Water Network
  Canadian Coalition on Wastewater-Related COVID-19 Research: A national collaboration of municipalities, utilities, researchers, public health organizations and governments with the shared goal of advancing Canada's ability to support decision-making for public health protection and surveillance in the face of COVID-19.
  http://cwn-rce.ca/wastewater-coalition/

- Ye, Y., Ellenberg, R., Graham, K., Wigginton, K.
  Survivability, Partitioning, and Recovery of Enveloped Viruses in Untreated Municipal Wastewater
  https://pubs.acs.org/doi/abs/10.1021/acs.est.6b00876

- Xagoraraki, I., O'Brien, E.
  Wastewater-Based Epidemiology for Early Detection of Viral Outbreaks
  https://link.springer.com/chapter/10.1007/978-3-030-17819-2_5
  https://www.medrxiv.org/content/10.1101/2020.05.19.20105999v1.full.pdf


• Hart, O., Halden, R. Computational Analysis of SARS-CoV-2/COVID-19 Surveillance by Wastewater-Based Epidemiology Locally and Globally: Feasibility, Economy, Opportunities and Challenges
U.S. Regulatory Guidance


- Department of Labour – Interim Guidance for Wastewater Workers and Employers
  https://www.osha.gov/SLTC/covid-19/controlprevention.html#solidwaste

Canadian Regulatory Guidance

Regulatory guidance by provinces regarding the operation of water and wastewater facilities during the COVID-19 pandemic, including regulatory relief measures.

- Ontario Regulation 75/20 order under subsection 7.0.2 (4) of the Act | Drinking Water Systems and Sewage Works made under the Emergency Management and Civil Protection Act (March 23, 2020)
  https://www.ontario.ca/laws/regulation/r20075

- Alberta | Conditional certification during the COVID-19 pandemic (March 24, 2020)

- British Columbia | Emergency Preparation and Response List of COVID-19 Essential Services (March 26, 2020)
  https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/covid-19-provincial-support/essential-services-covid-19

- Nova Scotia | Order by the Medical Officer of Health under Section 32 of the Health Protection Act regarding essential infrastructure workers who are exempt from some aspects of social distancing (March 24, 2020)
Business Continuity Planning

Canadian and U.S. guidance documents, planning guides, templates and webinars that focus on continuity of operations during a pandemic.

Guidance and Considerations for the Development of Business Continuity Plans


- U.S. EPA | Mutual Aid and Assistance for Drinking Water and Wastewater Utilities
  Learn about Water and Wastewater Agency Response Networks (WARN) and access WARN resources and training tools.

- Ontario Water/Wastewater Agency Response Network (WARN)
  http://www.onwarn.org/_layouts/15/start.aspx#/SitePages/Home.aspx

- American Water Works Association (AWWA) webinar
  Utility Actions to Sustain Operations During COVID-19 (March 20, 2020)
  https://www.gotostage.com/channel/awwa-covid-19


- WEF webinar
  Pandemic Continuity of Operations Essential Personnel (March 19, 2020)
  https://www.wef.org/events/webcasts/upcoming-webcasts/2020-webcasts/PandemicCOOPMar2020/

- Water Research Foundation (WRF)

Great Lakes Community Action Partnership – Planning for Pandemics Tool Kit
This resource is geared to small systems and includes a webinar on emergency and pandemic planning for drinking water systems and emergency planning templates. https://www.glcap.org/programs/community-rural-development/rural-community-assistance-program-rcap/rcap-services-in-ohio/ohio-planning-for-pandemics-toolkit/

Moonshot Missions | Coronavirus Compendium: Key Considerations for Water and Wastewater Utilities Responding to the Coronavirus

Government of Alberta
COVID-19 Pandemic Planning for the Water and Wastewater Sector

World Health Organization
https://www.who.int/publications-detail/draft-operational-planning-guidance-for-un-country-teams

Management of Internal Operations

WEF Water Professional’s Guide to COVID-19 (February 11, 2020)

Talking Under Water podcast (March 19, 2020)
An interview with WEF Executive Director Walt Marlowe. Talking points: remote work and distance technologies, effectiveness of current disinfection practices, flushable wipes, staffing and more.

International Water Association
Webinar Recording: COVID-19 – A Water Professional’s Perspective

Water Services Association of Australia
COVID-19: Guidance on Essential Workers
Canadian Water Network’s
Canadian Municipal Water Consortium

- United States Environmental Protection Agency
  Incident Action Checklist for Pandemic Incidents

- International Water Association
  Webinar Recording: COVID-19 – A Utility Leaders’ Response
  https://iwa-network.org/learn/a-utility-leaders-response-to-covid-19/
  Key discussion topics:
  o Management response to challenging conditions (providing safeguards to staff, working from home, payment relief to customers; PPE use based on government guidance and availability);
  o Financial implications (including immediate and over the long-term due to economic impacts, role of metering and rate structures, opportunity for economic stimulus investments in infrastructure);
  o How the water utility may change after COVID-19 (opportunity to improve emergency response plans, use of digital technologies, staff resilience, public/internal communication, reflect on what elements benefited them in the pandemic response, maintain good working relationships with regulator, suppliers and contractors, etc.)

- Xylem – Albert Cho and George Hawkins
  White Paper: Continuity through the Coronavirus and Beyond – Managing Water and Wastewater Utility Risks During COVID-19

Assessing the Resilience of Water and Wastewater Systems
- AWWA Water System Preparedness and Best Practises for Pandemic Influenza (January 1, 2009)

- Water Research Foundation
  Report from 2017 presenting best practices to support water system resilience.

- International Water Resources Association (IWRA)
  Policy Brief: COVID-19 Challenges the Water Sector
COVID-19 Response Resources from Peer Sharing Networks

- Members of the Association of Metropolitan Water Agencies (AMWA) are collaborating to share resources related to utility pandemic preparedness
  [http://amwa.net/covid19](http://amwa.net/covid19)

- AMWA weekly briefings on COVID-19
  [https://www.amwa.net/periodical/monday-morning-briefing](https://www.amwa.net/periodical/monday-morning-briefing)

- Water Environment Federation (WEF) COVID-19 water-sector specific information
  Includes links to WEF documents, webinar recordings and other resources.

- Isle Utilities
  COVID-19 Update Webinars and WhatsApp International Collaboration Initiative
  Isle has developed a global collaboration platform for learning and best practices throughout the COVID-19 pandemic that now includes participants from 48 countries. Each week Chairman Piers Clark leads two webinars to share information and learnings from the COVID-19 group.
  Link 1: [https://www.isleutilities.com/covid-19](https://www.isleutilities.com/covid-19)

- Isle Utilities
  For access to the report, please contact Piers Clark at piers.clark@isleutilities.com
Emerging and Future Considerations for Municipalities and Utilities

This section looks at compounding challenges that may occur during the pandemic, as well as concerns related to resuming building or system operations following long periods of inactivity.

Assessing and Managing Financial Impacts from COVID-19

- COVID-19-related Revenue Risks Keeping Utility CFOs Up at Night
  Blog post by Dr. Christine Boyle, Solution Lead, Metering Insights and Revenue Resilience, Xylem Inc.
  https://www.linkedin.com/pulse/covid-19-related-revenue-risks-keeping-utility-cfos-up-boyle/

- American Water Works Association
  https://www.awwa.org/Events/AWWA-Events-Calendar/Meeting-Details?productId=83982492

- American Water Works Association & Association of Metropolitan Water Agencies
  The Financial Impact of the COVID-19 Crisis on U.S. Drinking Water Utilities

Water Consumption and Demand Forecasting

- Jorge Helmbrecht, Director General, WatEner
  Water Consumption and Demand Forecasting during COVID-19 Crisis

Flood Risk Management and Response During COVID-19

- The St. Lawrence Seaway’s Montreal-Lake Ontario section will open on April 1st so that the International Joint Commission can move record volumes of water out of Lake Ontario and provide relief to lakeshore communities battered by high water levels.

- A reporter at the National Observer has noted that riverine flooding during the pandemic will bring added complications to emergency management, particularly to communities that have been relocated in past years.

Considerations for the Reopening and Recommissioning of Buildings

- The Center for Plumbing Safety at Purdue University is looking at issues that may arise such as increased exposure to lead and legionella when re-commissioning community buildings such as daycares and schools. [https://engineering.purdue.edu/PlumbingSafety/project/covid19-response](https://engineering.purdue.edu/PlumbingSafety/project/covid19-response)


- Purdue University Center for Plumbing Safety Building Water System Guidance Analysis [https://engineering.purdue.edu/PlumbingSafety/covid19/guidance-analysis](https://engineering.purdue.edu/PlumbingSafety/covid19/guidance-analysis)

- Proctor, C., Rhoads, W., Keane, T., Salehi, M., Hamilton, K., Pieper, K., Cwiertny, D., Prévost, M., Whelton, A. Considerations for Large Building Water Quality after Extended Stagnation (Draft) [https://www.researchgate.net/publication/340513659_Considerations_for_Large_Building_Water_Quality_after_Extended_Stagnation](https://www.researchgate.net/publication/340513659_Considerations_for_Large_Building_Water_Quality_after_Extended_Stagnation)


- United States Environmental Protection Agency Information on Maintaining or Restoring Water Quality in Buildings with Low or No Use [https://www.epa.gov/coronavirus/information-maintaining-or-restoring-water-quality-buildings-low-or-no-use](https://www.epa.gov/coronavirus/information-maintaining-or-restoring-water-quality-buildings-low-or-no-use)
• Régie du bâtiment du Québec (RBQ) in collaboration with Michèle Prévost, Professor at Polytechnique Montréal and NSERC Industrial Chair on Drinking Water Recommendations for Restoring Service to Water Distribution Systems in Vacant Buildings

• International Water Association
Communicating with the Public

We’ve started to curate some public communication examples (web pages, media releases and social media campaigns) that utilities may find useful when designing their own communications campaigns. We’ll add more examples to the list in our update next week.

Guidance on Communications Strategies and Toolkits for the Water Sector

- U.S. EPA | Water Utility Communication During Emergency Response
  Includes: Effective risk and crisis communication, anticipating public questions, and developing risk communication plans
  [https://www.epa.gov/waterutilityresponse/water-utility-communication-during-emergency-response](https://www.epa.gov/waterutilityresponse/water-utility-communication-during-emergency-response)

- American Water Works Association (AWWA) webinar
  Be a Trusted Source: How to Handle Communication Challenges During COVID-19 (April 3, 2020)
  [https://www.awwa.org/Events-Education/Events-Calendar/cTi/ViewEvent/mid/6794/OccurrenceId/378](https://www.awwa.org/Events-Education/Events-Calendar/cTi/ViewEvent/mid/6794/OccurrenceId/378)

- Water Environment Federation: “Water’s Worth It” Toolkit
  A toolkit providing a series of graphics that highlight the role of the water sector in coronavirus response and can be used to communicate with the public on social media and other platforms.

- U.S. Water Alliance: COVID-19 Communication Strategies for the Water Sector

- Value of Water Campaign: COVID-19 Response Tools
  The Campaign has gathered examples on how to communicate with the public during the pandemic about water-related topics.
  [http://thevalueofwater.org/content/covid-response-tools](http://thevalueofwater.org/content/covid-response-tools)

- Water Services Association of Australia
  Infographic for communicating with the public: “12 Facts about COVID-19 Virus in Water”
  [https://www.wsaa.asn.au/system/files/attachments/EVuWa3MWoAA7v5H.jpg](https://www.wsaa.asn.au/system/files/attachments/EVuWa3MWoAA7v5H.jpg)
• Water Research Commission (South Africa)
COVID-19 Fact Sheet & Infographic: Maintaining Good Hand Hygiene
Fact Sheet: http://wrcwebsite.azurewebsites.net/mdocs-posts/covid-19_fact-sheet-2/
Infographic: http://wrcwebsite.azurewebsites.net/mdocs-posts/648_wrc_infographics-2_ks_v4_20200416.pdf/

Communicating re: the Safe & Continued Supply of Drinking Water
• Joint statement from AMWA, AWWA and the National Association of Water Companies
  Major Water Associations Reassure Public on Safety of Tap Water During COVID-19
  Outbreak (March 17, 2020)
• @PhillyH2O customer blog http://water.phila.gov/covid-19/

Communicating re: Non-Flushable Materials
• Canadian Water and Wastewater Association (CWWA)
  COVID-19 and Sewers: To avoid a sewage back-up don’t treat your toilet like a trash can
  (March 20, 2020)

Communicating re: Reopening or Recommissioning of Buildings
• EPCOR Water Services
  Facility Managers: How to Maintain Water Quality During Low Building Occupancy
  Scenarios – Like During the COVID-19 Pandemic
• Halifax Water
  Re-opening Buildings During or After COVID-19
  http://www.halifaxwater.ca/re-opening-buildings-during-or-after-covid-19
• Utilities Kingston
  Property Owners: Learn How to Safely Reopen Buildings
  http://utilitieskingston.com/News/Article/Property-owners-learn-how-to-safely-reopen-buildings

Examples of Public Communications from Municipalities/Utilities
• Utilities Kingston news posts on access to services, financial support and other COVID-19 updates.
  https://utilitieskingston.com/Corporate/COVID19
• EPCOR’s public communications on their response to COVID-19. 
https://www.epcor.com/covid-19-canada/Pages/default.aspx

• Union Water Supply Service news release on the safety of treated drinking water during the COVID-19 outbreak. 

• Detroit Coronavirus COVID-19 Water Restart Plan
The state of Michigan is covering the costs to restore recently interrupted residential water service due to non-payment.

• Region of Peel: Public Works at the Region of Peel during COVID-19
YouTube video communicating to the public how the Region is continuing to provide essential services during the pandemic. 
https://www.youtube.com/watch?v=4oUG_F_qZVk#action=share

• York Region
Navigating Supports and Services
The Region has created to assist residents in navigating through the services and supports offered by each level of government. 
https://www.york.ca/wps/portal/yorkhome/newsroom/news/navigatingsupportsandservices/

• City of Winnipeg
Announcement: COVID-19 Impacts on Utility Services and Billing
https://myutilitybill.winnipeg.ca/UtilityPortal/announcements

• City of Thunder Bay
COVID-19 Update to the Public: Key Changes to City Services and Financial Relief Measures

• Utilities Kingston
COVID-19 and Your Utilities: Assistance for Customers and Update on Suspension of Non-Critical Programs
https://utilitieskingston.com/Corporate/COVID19