

Guidance for recommissioning building water systems following COVID19

Ian Douglas

Penny Wilson

City of Ottawa

Water Quality

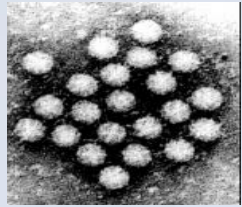


Background: *what is the issue?*

- ❖ Due to COVID19 situation, many buildings have been unoccupied for weeks or months;
- ❖ Minimal water usage patterns in buildings can result in stagnant water sitting in plumbing and tap fixtures.
- ❖ Actions are required to thoroughly flush and restore water quality in the building prior to use by staff and occupants; This process may take a few hours to a few days to complete;
- ❖ Industry experts have prepared guidance for operators of building water systems: NOTE each building has a unique configuration;



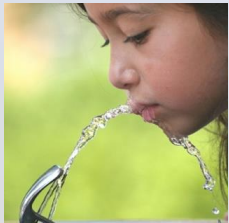
Risks to water quality



Microbial: bacteria can grow in pipe biofilms and in some cases can be harmful to human health. In particular, *Legionella* bacteria can grow in hot water systems, and if inhaled can lead to a serious type of pneumonia;



Chemical: water stagnation can increase the concentration of harmful metals such as lead and copper within tap fixtures and water fountains; This water can be readily purged by flushing at the point of consumption;



Aesthetic: water stagnation can impair the appearance and taste of drinking water in building plumbing systems (eg. cloudy, rusty, metallic or plastic taste);

Risk of back-flow or cross-connection



Backflow or cross-connection: if water pressure was not maintained within the building, there is an increased risk of contamination through back-flow or plumbing cross-connection (eg. sanitary / storm drain, chemical, glycol, etc.);

Which buildings are affected?



Water quality may be a concern if:

- ❖ building occupancy has been <25%
- ❖ building has been unoccupied for 1 month or more
- ❖ any floor of a building that has had low occupancy



Types of Buildings

1. Large buildings (>3 floors): eg. large office buildings, institutions
2. Small buildings (1-3 floors): eg. plazas, restaurants, medical buildings
3. City owned/operated facilities: eg. community centres, arenas
4. Households

Depending on the size and layout of the building (eg. multiple floors) the flushing plan needs to look at the best and most efficient way to bring fresh water to each point of consumption/use;

Understanding the pipe configuration within the building is required to determine the sequence of flushing;

Industrial parks with private watermains need to conduct hydrant flushing of their system prior to flushing the buildings;

Water treatment & distribution: **Ottawa**

Ottawa's water supply has continued to operate and provide safe drinking water throughout the COVID19 situation. The City of Ottawa is responsible to provide high quality drinking water to the property line. City staff are taking additional steps to help building owners achieve effective flushing of their piping systems:



What is City doing to help?



- 1) Routine weekly monitoring of water quality at 25 sample locations throughout the City;
- 2) Pre-check chlorine levels in watermains for low flow areas during COVID;
- 3) Flushing local watermains to bring fresh water to property line, if required;
- 4) Increasing seasonal levels of chlorine in water supply to 2.0 – 2.4 mg/L through the transition period;
- 5) Provide technical support for specific water quality issues;

How can you get ready? Steps to prepare for building flushing



- **Map** – sketch of the building water system layout to plan the flushing strategy;
- **Fresh water** – flush the water service line (connecting the watermain to the building) to bring fresh water into the building at the point of entry (eg. mechanical room);
- **Water temperature** – a thermometer can be used to verify that fresh water has been achieved. Flush until water temperature is cool and stable, typically between 10 – 20 °C.
- **Chlorine concentration** – chlorine measurements can be used as an indicator of fresh water. Total chlorine levels of 1.0 – 2.0 mg/L are representative of water within City watermains (NOTE: since Ottawa uses chloramine, the measurement for total chlorine must be used);



Building flushing strategy

- 1) Start at a tap close to where the water enters the building and systematically flush all taps and/or fountains on that floor.
- 2) Flush each cold water tap at full flow for 10 – 30 minutes or until a stable “cool” water temperature is reached (approximately 10 – 20 °C). Total chlorine concentration can also be used to verify fresh water to each tap;
- 3) Move through each floor in the direction of water flow, flushing to each point of consumption (eg. kitchen tap fixture, fountain).

“Other” considerations during flushing

- **Tap aerators:** should be removed and cleaned during flushing procedure, if possible;
- **Water filtration / treatment systems:** should be removed or by-passed during flushing; Filtration systems should be cleaned and/or replaced if necessary;
- **Showerheads:** should be removed from showers prior to flushing; Due to potential growth of *Legionella* bacteria, showerheads should be cleaned and disinfected before recommissioning;
- **Automatic taps:** de-activate electronic function of automatic taps during flushing



“Other” considerations during flushing (continued)

- **Water features** (eg. cascades, decorative fountains): should be shutdown, cleaned and disinfected prior to recommissioning;
- **HVAC related water systems (eg. cooling towers)**: should be serviced and disinfected as per guidance documents and/or manufacturer’s specifications;
- **Hot water systems** should be serviced/maintained/flushed as per guidance documents; Hot water systems must achieve proper temperatures to minimize risk of *Legionella* bacteria (eg. 60 °C in water tank, and 55 °C at point of use);





Check-list*

**CWWA: Canadian
Water & Wastewater
Association*

CHECKLIST

Re-Opening Buildings - Building Owners/Operators

- **Before you start - Map or sketch your entire water system**
 - Identify zones and include all treatment equipment, pumps, valves, tanks, etc.
 - list all outlets/fixtures such as taps, fountains, showers, etc.
 - be sure to include any connected food units like ice or coffee makers
- **Flush your entire system**
 - start where the water enters the building and work from closest to furthest, closest zone to furthest zone, closest outlet to furthest outlet
 - flushing requirements vary but run the water until the water maintains a constant cold temperature and the disinfectant (like chlorine) is detected
 - this should be a rigorous flush so you want to open taps fully (remove the aerator filter or shower head) but be aware this could cause greater spray and aerosols
 - staff should wear appropriate PPE such as gloves, mask (N95 is recommended), and eye cover while flushing
- **Hot Water**
 - Flush your cold water system first then your hot water system
 - Hot water tanks should be kept above 60°C to ensure a temperature over 50°C throughout the system. Be sure to flush the tank fully to replace all of its water. You may consider draining the tank, but be cautious as this could stir up sedimentation or cause syphoning concerns
 - Then flush the hot water system from closest to furthest from the tank
- **Cleaning**
 - If possible, clean, disinfect and rinse all outlets, screens etc.
- **Shocking your system**
 - Shock chlorination may only need to be considered if you have a large system with remote branches, storage tanks, or you still detect issues after flushing, if you serve vulnerable populations or have a history of pathogen problems
 - Such system shocking should be conducted by a water treatment professional
- **Testing**
 - For smaller buildings, after flushing, you should be able to feel a consistent cold temperature and even detect disinfectant (such as chlorine by smell)
 - For larger buildings and any building serving vulnerable populations, professional testing is highly recommended
 - Testing for disinfectant residual - simple equipment and/or testing services are available from local water treatment companies, plumbers and pool professionals
 - Testing for microbial pathogens – for complex systems, buildings serving vulnerable populations, or any with a history of contaminations (like Legionella) – these issues are often related to water in HVAC systems. Your local health unit should be contacted for assistance.

THIS IS A SIMPLE CHECKLIST – REFER TO THE RESOURCE LINKS FOR DETAILED GUIDANCE

Guidance documents (with links)

- Canadian Water & Wastewater Association FACT SHEET and CHECK LIST: <https://cwwa.ca/covid-19-and-the-re-opening-of-buildings/>
- Environmental Science & Policy Research Institute (J.Clancy et al): <https://esprinstitute.org/BuildingWaterAndCovid.html> and PDF: https://esprinstitute.org/wp-content/uploads/2020/05/FINAL_Reducing-Risk-to-Staff-Flushing-Buildings-20200501.pdf
- Quebec government guidance for return to service of water in buildings: <https://www.rbq.gouv.qc.ca/fileadmin/medias/pdf/Publications/anglais/ang-recommandations-remise-en-service-eau-batiments-inoccupes.pdf>
- American Water Works Association: <https://www.awwa.org/Resources-Tools/Resource-Topics/Coronavirus#10681543-shutoffs-and-return-to-service-guidance>



Questions ?

AIDE-MÉMOIRE

Réouverture des immeubles — propriétaires et exploitants d'immeubles

- ❑ **Avant de commencer - Élaborez un plan ou une esquisse de l'ensemble de votre système**
 - ❑ Indiquez les zones comprenant tous les équipements de traitement, les pompes, les valves, les réservoirs, etc.
 - ❑ Énumérez toutes les prises et les accessoires comme les robinets, les fontaines, les douches, etc.
 - ❑ N'oubliez pas d'inclure tous les petits appareils électroménagers comme les machines à glace et les cafetières
- ❑ **Rinçage de l'ensemble de votre système**
 - ❑ Commencez par l'entrée d'eau de l'immeuble et procédez du point le plus près au plus éloigné, de la zone la plus proche à la plus éloignée, de la prise la plus proche à la plus éloignée
 - ❑ Les besoins de rinçage peuvent varier, mais laissez couler l'eau jusqu'à ce qu'elle maintienne une température froide constante et que le désinfectant (comme le chlore) soit détecté
 - ❑ Cela devrait être un rinçage vigoureux avec l'ouverture complète du robinet (retirez les aérateurs ou le pommeau de douche) mais sachez que cela pourrait provoquer une plus grande pulvérisation et aérosols.
 - ❑ Le personnel doit porter l'EPP comme des gants, un masque (N95 est recommandé) protection pour les yeux pendant le rinçage
- ❑ **Eau chaude**
 - ❑ Rincez d'abord votre système d'eau froide, puis votre système d'eau chaude
 - ❑ Les réservoirs d'eau chaude devraient être à une température au-dessus de 60°C pour assurer que l'eau chaude est au-dessus de 50 °C dans tout le système. Assurez-vous de rincer le réservoir à fond pour remplacer toute son eau. Vous pouvez envisager de vider le réservoir mais soyez prudent car cela pourrait attiser la sédimentation ou causer des problèmes de siphonage.
 - ❑ Puis rincez le système en partant du point le plus près du réservoir, en allant vers le plus éloigné
- ❑ **Nettoyage**
 - ❑ Si possible nettoyez, désinfectez et rincez toutes les prises d'eau, les filtres, etc.
- ❑ **Chloration-choc de votre système**
 - ❑ Envisagez la chloration-choc seulement dans le cas d'un grand système avec des branchements isolés, des réservoirs de stockage ou si vous décelez des problèmes après le rinçage, ceci si vous servez des populations vulnérables ou avez des antécédents de problèmes de pathogènes.
 - ❑ Un tel traitement choc du système doit uniquement être effectué par un professionnel de l'eau
- ❑ **Vérification**
 - ❑ Dans les plus petits immeubles, après le rinçage, vous devez pouvoir sentir une température froide homogène et même déceler le désinfectant (comme la senteur du chlore)
 - ❑ Dans les plus grands immeubles et tous ceux qui desservent des populations vulnérables, une vérification professionnelle est fortement recommandée
 - ❑ La vérification de désinfectant résiduel pour un équipement simple ou des services de vérification sont offerts par des entreprises locales de traitement de l'eau, des plombiers et des spécialistes des piscines
 - ❑ Les tests de dépistage de pathogènes microbiens sont recommandés pour les systèmes complexes, les immeubles desservant des populations vulnérables ou ayant un historique de contamination (comme la *Legionella*), problèmes souvent liés à l'eau des systèmes de CVAC. Pour obtenir de l'aide consultez votre bureau de santé publique.

Ceci est un Aide-Mémoire simple – pour des renseignements détaillés veuillez consulter les Ressources.

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