EPA United States Environmental Protection Agency

Maintaining and Restoring Water Quality in Buildings During the COVID-19 Response

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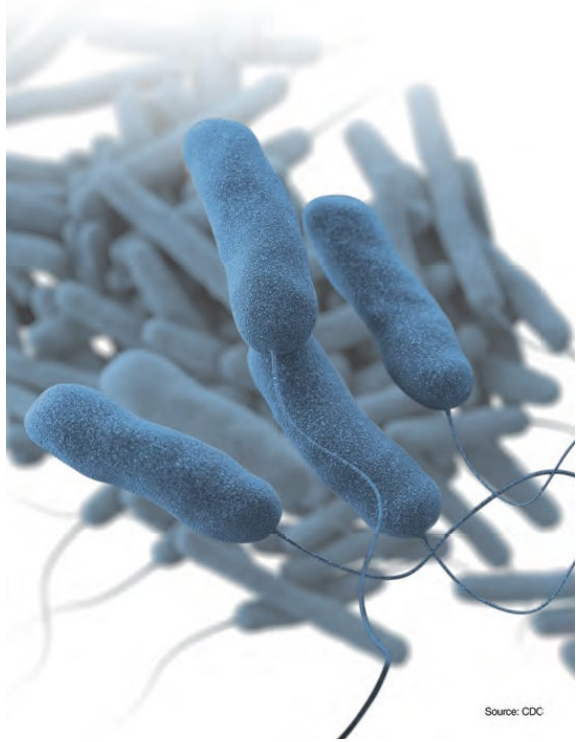
Overview

Low/No Water Use

- Building and business closures for weeks or months reduce water usage, potentially leading to stagnant water inside building plumbing.
- This water can become unsafe to drink or otherwise use for domestic or commercial purposes.
  - *Legionella* and other pathogens
  - Water Chemistry
    - Leaching of metals (lead)
    - Formation of disinfectant by-products

Potential Risks in Building Water Systems

- Opportunistic pathogens can grow under favorable conditions, which may be present in some building plumbing systems under certain circumstances.
  - Typically affect people with underlying health conditions or those from other sensitive groups
  - Exposures are typically from inhalation of aerosols (e.g., showering, cooling towers)
  - They include:
    - Legionella bacteria – cause of legionellosis – Legionnaires' Disease (severe pneumonia) and Pontiac Fever (milder, flu-like)
    - Pseudomonas – pneumonia and dermal infections
    - Mycobacterium avium complex – pneumonia



Potential Risks in Building Water Systems

- Contaminant concentrations can increase in building water systems under certain circumstances:
  - Disinfection byproducts
    - Concentrations can increase in pipes due to reactions between carbon-based substances and some disinfectants
    - Affected by water age, temperature, pH and other factors
  - Lead and other metals (copper, iron)
    - Lead can enter drinking water when plumbing materials that contain lead corrode. Lead can affect almost every organ and system in your body. Children are most susceptible to the effects of lead

Potential Risks in Building Water Systems

- Buildings that have seen low/no water usage for weeks or months could have:
  - Depleted or exhausted residuals
  - Formation of disinfection byproducts
  - Growth of biofilms and disease-causing microbes in pipes, faucets, and appliances
  - Corrosion of lead and/or copper, and leaching of other contaminants
  - Taste and odor concerns

Utility Supply

- Conditions in the municipal supply provide protection to building water systems. These include:
  - Residuals (chlorine/chloramine) are used to inactivate microbes that may contaminate distribution systems, indicate issues with the distribution system, and control biofilm growth.
  - Corrosion control provided by public water supplies also protects the water quality in buildings

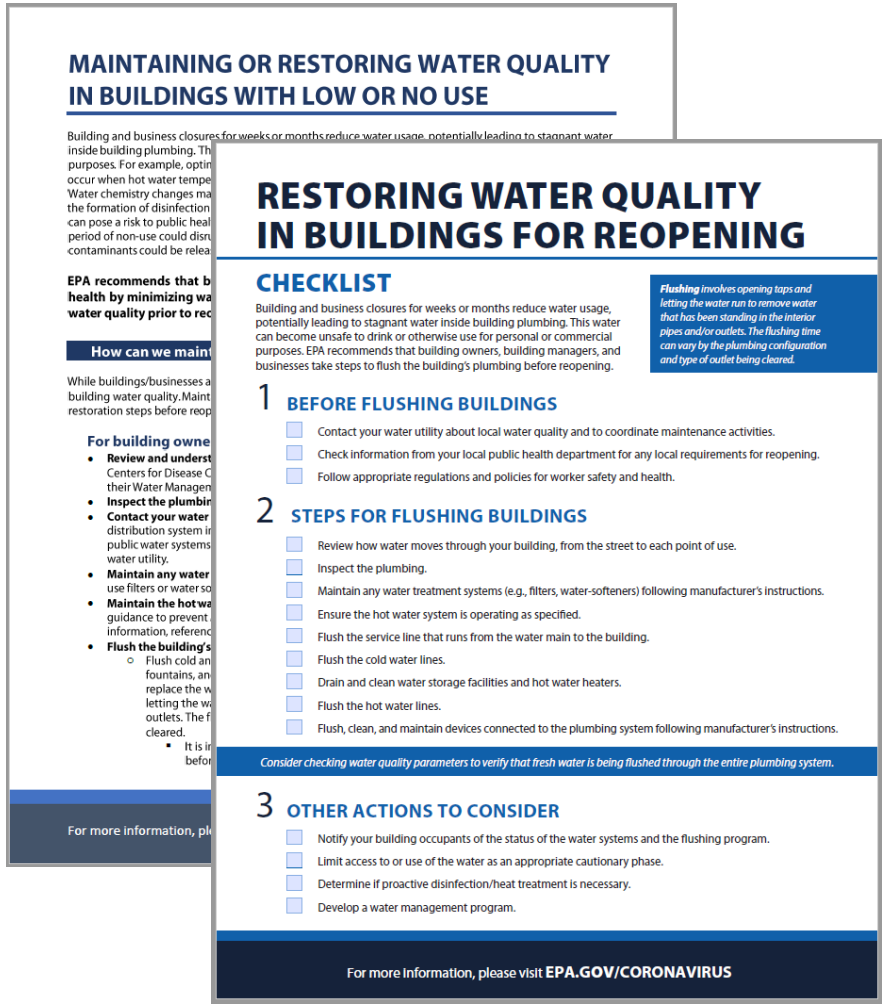
How to maintain water quality in the building

- Management of water age
- Maintenance of an adequate disinfectant residual
- Flushing of system to minimize accumulation of biofilms and sediments
- Control of water temperature
- Small buildings can often more easily control water quality than large buildings

EPA's Guidance for Buildings

- Guidance
  - Maintain water quality while closed
  - Steps for reopening buildings/businesses
  - Steps for reopening non-community water systems
- Checklist for reopening

https://www.epa.gov/coronavirus/information-maintaining-or-restoring-water-quality-buildings-low-or-no-use



MAINTAINING OR RESTORING WATER QUALITY IN BUILDINGS WITH LOW OR NO USE

RESTORING WATER QUALITY IN BUILDINGS FOR REOPENING

CHECKLIST

Building and business closures for weeks or months reduce water usage, potentially leading to stagnant water inside building plumbing. This water can become unsafe to drink or otherwise use for personal or commercial purposes. EPA recommends that building owners, building managers, and businesses take steps to flush the building's plumbing before reopening.

Flushing involves opening taps and letting the water run to remove water that has been standing in the interior pipes and/or outlets. The flushing time can vary by the plumbing configuration and type of outlet being cleared.

1 BEFORE FLUSHING BUILDINGS

- Contact your water utility about local water quality and to coordinate maintenance activities.
- Check information from your local public health department for any local requirements for reopening.
- Follow appropriate regulations and policies for worker safety and health.

2 STEPS FOR FLUSHING BUILDINGS

- Review how water moves through your building, from the street to each point of use.
- Inspect the plumbing.
- Maintain any water treatment systems (e.g., filters, water-softeners) following manufacturer's instructions.
- Ensure the hot water system is operating as specified.
- Flush the service line that runs from the water main to the building.
- Flush the cold water lines.
- Drain and clean water storage facilities and hot water heaters.
- Flush the hot water lines.
- Flush, clean, and maintain devices connected to the plumbing system following manufacturer's instructions.

Consider checking water quality parameters to verify that fresh water is being flushed through the entire plumbing system.

3 OTHER ACTIONS TO CONSIDER

- Notify your building occupants of the status of the water systems and the flushing program.
- Limit access to or use of the water as an appropriate cautionary phase.
- Determine if proactive disinfection/heat treatment is necessary.
- Develop a water management program.

For more information, please visit **EPA.GOV/CORONAVIRUS**

EPA's Guidance for Buildings

- Audience (owners, managers, occupants)
  - Restaurants/bars
  - Retail shops/malls
  - Office buildings
  - Entertainment venues
  - Athletic and fitness centers/gyms
  - Hospitals/healthcare facilities/dental facilities
  - Manufacturers
  - Large campuses (schools, multibuilding office complexes)

Involves close coordination between owners, managers, and occupants of the building.

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Restoring Water Quality in Buildings for Reopening

Before Flushing

- Contact your water utility
  - Local water quality and usage
  - Type and residual level of disinfectant
  - Coordinate maintenance activities
- Check information from your public health department for reopening requirements
- Follow appropriate regulations and policies for worker safety and health

Flushing Buildings

- Review how water moves through your building, from the street to each point of use
  - Plumbing configuration
  - Water usage
- Inspect the plumbing
- Maintain any water treatment systems following manufacturer's instructions
  - Point-of-entry/point-of-use filters, water softeners
- Ensure the hot water system is operating as specified
  - Maintain the temperature at or above 140°F to prevent *Legionella*

Flushing Buildings, continued

- Flush the plumbing
  - The service line that runs from the water main into the building
  - Flush the cold-water lines
    - Faucets, toilets, showers, drinking fountains
  - Drain and clean water storage facilities/hot water heaters
  - Flush the hot-water lines
  - Flush, clean, and maintain devices connected to the water system following manufacturer's instructions
    - Refrigerators, ice makers
  - Consider checking water quality parameters to verify that fresh water is being flushed through the entire plumbing system
    - Temperature, pH, and disinfectant levels

Flushing

Open taps and let the water run to replace the water in the pipes. Flush time will vary by plumbing configuration and outlet type.

Flushing Buildings, continued

- Maintain all other building water systems
  - Emergency safety devices (sprinklers, eye-wash, showers)
  - Decorative fountains, spas, hot tubs, pools, and cooling towers.
    - See CDC's Guidance for Reopening Buildings
  - Sanitary and other water drainage/collection systems
    - Fill all drain traps
  - Consider documenting all steps for future reference

Other Actions to Consider

- Notify your building occupants of the status of the water systems and the flushing program
- Limit access to or use of the water as an appropriate cautionary phase
- Determine if proactive disinfectant/heat treatment is necessary
- **Develop a water management program**

Steps for Non-Community Water Systems

- Contact your state to discuss specific requirements
- Perform a start-up procedure, if necessary
- Follow other recommendations in the guidance

Non-Community Water System

Buildings, campuses, or other entities that treat their own water and are regulated under the Safe Drinking Water Act. Examples include schools, restaurants, gas stations, churches, or recreational facilities.

Helpful Links

- EPA Guidance: Disinfecting, Cleaning and Addressing Water Quality
  - https://www.epa.gov/coronavirus/epa-guidance-disinfecting-cleaning-and-addressing-water-quality-challenges-related
- CDC's Guidance for Reopening Buildings
  - https://www.cdc.gov/coronavirus/2019-ncov/php/building-water-system.html
- CDC's Water Management Program
  - https://www.cdc.gov/legionella/wmp/
  - WMP Toolkit - https://www.cdc.gov/legionella/wmp/toolkit/index.html
  - Legionella Control Toolkit - https://www.cdc.gov/legionella/wmp/control-toolkit/index.html *NEW!*

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Thank you