



Alliance to Prevent Legionnaires' Disease

Alliance to Prevent Legionnaires' Disease, Inc.
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preventlegionnaires.org | 1-202-434-8757

April 29, 2020

To: Water Utility Managers, Facility Operators, Maintenance Engineers, and Concerned Citizens:

Subject: Potential Increased Exposure Risk to *Legionella* Bacteria and Other Opportunistic Pathogens in Re-Opening Shuttered Facilities & Idled Buildings after Covid-19 Shutdowns

The Alliance to Prevent Legionnaires' Disease is a non-profit organization dedicated to *reducing the occurrence of Legionnaires' disease by promoting public research and education on the disease, and best practices and policy for its prevention.*

As the nation grapples with the adjustment to a new way of living and working during the Covid-19 pandemic, it is important to be mindful that actions taken to address Covid-19 could have the unintended consequence of increasing the incidence of other pathogens. The reduction and changes in water usage across community water systems and facilities caused by government-ordered shutdowns has increased risks of waterborne illness due to water age, stagnation, dissipation of disinfectants, and other factors.

This creates a favorable environment for waterborne bacteria and other pathogens to proliferate throughout water distribution systems, buildings, and residences. Of particular concern has been the re-opening of hotels, hospitals, and other buildings to serve as makeshift hospitals or other support systems in order to increase capacity and resources needed to treat Covid-19 patients.

As facilities are re-opened it is imperative that water utilities and facility managers take steps to minimize exposure to opportunistic pathogens including *legionella*, *pseudomonas aeruginosa* and *non-tuberculosis mycobacteria* that live in the biofilm of stagnant water throughout our water distribution systems, water storage tanks, buildings and residences. Further, once federal and state governments declare it safe for individuals to return to workplaces, which have been closed for multiple months, special care should be taken to prevent exposure to these pathogens during this process.

The Centers for Disease Control (CDC) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) have developed standards and guidelines that facility managers can follow to develop water management plans to reduce the risk of exposure to these pathogens in their buildings. The most recognized standard is ASHRAE Standard 188-2018 *Legionellosis: Risk Management for Building Water Systems* and includes language for building water system start-up from idled drained conditions or stagnant water conditions. The CDC's Toolkit is largely based on this standard. If these idled water systems are turned on



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without following recommended start-up practices, which include having a water management program in place to minimize risk of exposure, Covid-19 patients, healthcare workers and support personnel in these buildings could be exposed to waterborne pathogens, which would worsen an already difficult situation.

Recently, the CDC and other respected institutions and experts have released additional guidance specific to re-opening after prolonged shutdowns. We have included these recommendations in this document for water utilities, facility managers and those who want to learn more. Moreover, the Alliance believes that we must continue to raise general awareness of the public about waterborne pathogens like *legionella* bacteria in order to inform individuals of the signs and symptoms of exposure, especially those who are most susceptible, so they can seek medical care immediately. The final section of this guide includes basic information about *legionella* bacteria and Legionnaires' disease to educate and empower the public and reduce their risk of exposure.

This resource guide is divided into three sections:

1. [Water Utilities: Actions to Take](#)
2. [Facility Owners/Managers: Recommissioning Shuttered Buildings](#)
3. [Legionnaires' Disease: Understanding the Basics](#)

We hope you will find this to be a valuable resource guide to assist with our shared mission to reduce risks to the public of *legionella* and other waterborne pathogens. For more information on the Alliance and our work, please visit our website at www.preventlegionnaires.org

Best wishes and stay healthy!

Daryn S. Cline

Director, Technology and Science

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[Disclaimer](#)

The Alliance to Prevent Legionnaires' Disease has endeavored to assemble a useful and balanced collection of resource information to facilitate understanding about the sources and control of *Legionella* in idled or recently opened shuttered buildings. This effort identifies the work product of third parties as to which the Alliance to Prevent Legionnaires' Disease makes no warranty of any kind, expressed or implied, with regard to the content, quality, performance, transmission, or any other aspect of the information referenced. The Alliance to Prevent Legionnaires' Disease shall not be liable for any damages, including consequential damages, in connection with, or arising in any manner out of, the providing of the information offered therein.



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Water Utilities: Actions to Take

Purdue University worked with other research teams to develop and release guidance on April 7, 2020 which includes recommendations for water utilities for *Restoring Water to Medical, Residential, and Commercial Buildings, Shutdowns, Unsafe Water*.

The below is an excerpt of short and longer-term actions that the Purdue guidance recommends for utility managers as urban centers, facilities, and buildings are re-opening.

SHORT-TERM

1. Develop communication materials to distribute to building owners to inform them how COVID-19 may impact water quality in the distribution system.
2. Communicate to owners of large buildings about the need to maintain fresh water in plumbing.
3. Consider flushing water mains that serve commercial districts where buildings currently have low occupancy or are not being used.
4. Consider analyzing distribution system disinfectant residual data to identify portions of the system that are under-used to help target flushing. Temporarily expanding monitoring locations may better inform actions.
5. Ask building owners to report low or no water pressure to you immediately.

LONGER-TERM

1. Prioritize restoring water service to buildings for decommissioned health facilities, clinics, and long-term care facilities, and buildings serving vulnerable populations such as early childhood education facilities.
2. Consider continuing to flush water mains that serve commercial districts where buildings currently have low occupancy or are not being used.
3. Consider analyzing distribution system disinfectant residual data to identify portions of the system that are under-used to help target flushing. Temporarily expanding monitoring locations may better inform actions.
4. Coordinate building recommissioning so low pressure and depressurization do not occur when buildings become reoccupied.
5. Ask building owners to report low or no water pressure to you immediately.

The complete guidance can be viewed at:

<https://engineering.purdue.edu/PlumbingSafety/covid19/fag-building-water-safety>

For more detailed flushing guidance for water utility managers, visit Integrated Resource Management's [Guidance for Community Water Systems Regarding Stagnant Water](#).



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Facility Owners/Managers: Recommissioning Shuttered Buildings

Buildings that have been shuttered for extended periods could be a breeding ground for opportunistic pathogens, which could lead to human exposure once the plumbing systems are recommissioned. One example of concern has been the conversion of shuttered buildings into makeshift hospitals for additional healthcare capacity to serve highly susceptible populations.

Often when a building is closed, water becomes stagnant throughout the building's system. These areas of stagnant water, as well as biofilm coating the inside of pipes, provide the perfect environment for waterborne pathogens to grow.

Facility managers need to be aware that these dangerous pathogens could be present in their buildings and that this could lead to infections if the system is not properly flushed and disinfected. The incoming potable water supply should also be tested and brought into full compliance with federal and state water quality standards.

Some examples of potential exposure points to contaminated water include, but are not limited to:

- Meter screens and backflow prevention devices
- Faucets, toilets, showers, equipment and appliance screens and reservoirs
- Whirlpools and spas
- Hot water heaters, water storage tanks and water hammer arrestors
- Point-of-Entry and Point-of Use water filters, aerators, and flow restrictors
- Humidifiers, misters
- Hoses, eyewash stations and drinking water fountains
- All HVAC equipment including air handlers, adiabatic systems, heat rejection equipment
- Decorative Fountains, Irrigation Systems

As noted above, the key is that the facility manager develops and implements a water management plan consistent with ASHRAE Standard 188, CDC "Guidance for Building Water Systems" and the "Legionella Toolkit" that considers these potential hazards and takes steps to minimize the potential for infection from waterborne pathogens.



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Maintaining and Recommissioning Temporarily Idled Buildings

The same philosophy of building water risk management for opening buildings that have been shut down for years applies to buildings that have been shut down for weeks or months, and that will be recommissioned once the pandemic is contained. Managers for these facilities also need to develop and implement water management plans consistent with ASHRAE Standard 188, CDC "Guidance for Building Water Systems" and the "Legionella Toolkit" before they recommission water systems and recommission buildings.

If it is anticipated that a building will be closed only temporarily, facility managers should perform certain maintenance tasks to decrease the chances that waterborne pathogens will propagate in the building during the time it is operating at reduced capacity. These tasks include but are not limited to running water systems on a weekly basis, including:

- Hot water heaters
- Faucets, toilets, and showers
- All kitchen water using devices and appliances
- HVAC systems that use water
- Irrigation systems

Before the building is recommissioned and receives its occupancy permit, disinfectant and other water chemistry parameters need to be checked. All water using devices should be tested for pathogens before it is occupied. The system may need secondary disinfection added and flushed prior to use.

The concerns relating to stagnant water in idle buildings is being recognized across a range of industries. For more information please utilize the resources at the below links:

https://engineering.purdue.edu/PlumbingSafety/covid19/index_html

<https://www.ashrae.org/technical-resources/resources>

<https://www.cdc.gov/coronavirus/2019-ncov/php/building-water-system.html>

https://www.cdc.gov/legionella/wmp/toolkit/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Flegionella%2Fmaintenance%2Fwmp-toolkit.html

<https://www.bakerdonelson.com/coronavirus-impact-on-water-treatment>



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Legionnaires' disease: Understanding the Basics

Legionella bacteria is a waterborne pathogen that is commonly found in nature and source water such as lakes, rivers, and streams. There are numerous species and serogroups of *legionella*, and all can cause Legionnaires' disease in a susceptible person, but the most common disease-causing strain is *legionella pneumophila serogroup 1*.

Legionnaires' disease is a bacterial pneumonia, which can cause flu-like symptoms and lung inflammation. It is not contagious. It is contracted by bringing *legionella* bacteria deeply into the lungs by inhalation of water droplets or aspiration when drinking water (you have heard of water going down the wrong pipe).

Single/sporadic Cases of Legionnaires' disease account for 96% of all cases, according to the CDC despite the fact that outbreaks garner much of the press attention.

Many factors contribute to the growth of legionella including:

- Inadequate disinfectant levels in water distribution systems and/or a lack of water filtration at treatment plants.
- Stagnant water.
- Water temperature: *legionella* thrives in water between 68- and 122-degrees Fahrenheit. *Legionella* cannot survive at 158-degrees Fahrenheit or higher.
- Disruption to the water distribution system can lead to *legionella* bacteria entering homes and buildings from water main breaks, construction, flooding, and water source changes.

There are multiple points of possible exposure to legionella for humans outside and inside our homes and buildings including:

- Public water fountains
- Sprinklers, hoses, water misters
- Fire hydrants, swimming pools, hot tubs, water parks
- Water-cooled air-conditioning systems
- Showers, faucets, baths, CPAP machines, toilets, ice machines



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Risk Factors which make individuals more susceptible to contracting Legionnaires' disease include:

- Age, those 50 and older
- Current or former smokers
- Individuals with asthma, chronic lung disease, comorbidities, or other conditions like cancer which causes a suppressed immune system

Note, that exposure to *legionella* bacteria does not mean an individual will always contract Legionnaires' disease. Likewise, those who do not have any of these risk factors may also contract the disease. The above factors increase risks.

There are Several Symptoms of Legionnaires' Disease including:

- Flu-Like Symptoms
- Cough
- Fever
- Chills
- Aches
- Shortness of Breath
- Diarrhea

Note, with our country in the midst of the COVID-19 pandemic, many of the above-listed symptoms for Legionnaires' disease are symptoms of COVID-19. Seek medical attention immediately if you experience any of these and do not be afraid to ask your doctor about the possibility that your symptoms could be Legionnaires' disease so they can evaluate whether a test would make sense. Early diagnosis and treatment is key. Legionnaires' disease can be treated with antibiotics.

What You Can Do to Protect Yourself:

- Continue to raise your awareness about Legionnaires' disease
- Be sure to get regular check ups
- If you experience any of the above symptoms, contact your doctor



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- Determine whether you or your loved ones may be at “increased risk” based on the risk factors listed above
- If you smoke, quit
- Understand your exposure to water in your home and take extra precautions during system disruptions
- During long vacancies including but not limited to your home, an apartment, dormitory or second residence closed due to the COVID-19 pandemic or as a result of seasonality or lack of use, let hot water run for 2-3 minutes before use and leave the room while the water is running.¹
- If you notice a change in water quality, color, and taste, discontinue use and file a complaint with your water utility provider or facility manager if you are a tenant.

***For more information on Legionnaires' disease, please visit our website at:
www.preventlegionnaires.org***

Rev. A

¹ Freije, Matt, *Protect Yourself From Legionnaires' Disease*, <https://hcinform.com/publications/protect-yourself/>