

This Risk Alert provides facility managers tasked with reopening public buildings practical solutions for addressing potential Legionella, sewer odor and mold concerns.



Public buildings which have been unoccupied for extended periods may experience degradation due to factors including poor ventilation, corrosion, pests and vandalism. If not addressed prior to reoccupancy, some of these factors can lead to indoor air quality challenges when employees return to the workspace. This risk alert discusses three potential issues of concern and offers facility managers practical mitigation and abatement strategies.

Legionella

Certain bacteria can proliferate in stagnant or standing potable water plumbing systems. The most notable of these, Legionella, is capable of causing serious health concerns among individuals with certain health risk factors. Legionella has a particular affinity for warm water (77-108°F) with low or undetectable levels of disinfectant, such as chlorine. There are other bacteria which can also cause illness; however, steps to control Legionella should minimize the risks posed by these other pathogens as well.

The CDC has issued guidelines for controlling Legionella in building water systems. The guidelines have been summarized below:

1. Protect yourself. Out of an abundance of caution, it is recommended that building maintenance staff engaging in Legionella control activities don at least an N95-rated, reusable or disposable half-face respirator when performing aerosol generating activities. These include plumbing system flushing and/or cooling tower cleaning. Staff should ensure the use of the respirator conforms to the employer's respiratory protection program with respect to medical clearance, training, fit testing, user seal checks, etc.
2. Ensure building water heaters are properly maintained and the temperature is set to at least 120°F. While higher temperatures can further reduce the risk of Legionella growth, such temperatures also pose a scalding risk. Determine if the manufacturer recommends draining the water heater after a prolonged period of disuse. Carry out maintenance according to the manufacturer's instructions or hire a professional.
3. Flush hot and cold water through all points of use (e.g., showers, sink faucets, drinking fountains, etc.). The purpose of this flushing is to replace all stagnant water inside building piping with fresh water. Flush until the hot water reaches its maximum temperature. Exercise care to minimize splashing and aerosol generation during flushing. Other water-using devices, such as ice machines, may require additional cleaning steps, such as discarding old ice. Follow the manufacturers' instructions for the equipment.

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(cont.)

4. Clean all decorative water features, such as fountains. Follow any recommended manufacturer guidelines for cleaning. Ensure that decorative water features are free of visible slime or biofilm. After the water feature has been re-filled, measure disinfectant levels to ensure that the water is safe. (Tip: If sodium hypochlorite will be used to treat the water, pool test strips can be used to confirm residual chlorine levels.)
5. Ensure cooling towers are clean and well-maintained per manufacturer's guidelines and industry best practices. Ensure that the tower and basin are free of visible slime, debris, and biofilm before use. After confirming the tower appears to be well-maintained, perform an online disinfection procedure.
6. Ensure safety equipment including fire sprinkler systems, eye wash stations and safety showers are clean and well-maintained. Regularly flush, clean, and disinfect these systems according to manufacturers' specifications.

Sewer Odors

Modern sanitary plumbing systems incorporate water seals (aka plumbing traps or interceptors) to prevent sewer gases and odors from entering occupied spaces. When the liquid is not replenished such as when a building is unoccupied for an extended period, the trap/interceptor can dry out creating an opening for gases and odors to pass.

An easy solution for remedying a dry trap/interceptor is to operate the plumbing fixture. Turn on each faucet and flush each toilet. This will allow water to enter the drain, refill the trap/interceptor and reestablish the water seal. In cases when a building will remain unoccupied for extended periods, clean mineral oil can be poured into plumbing fixtures and floor drains. Approximately a cup should be enough for most plumbing fixture drains. The low vapor pressure of the mineral oil will resist drying out and maintain the integrity of the seal for long periods.

In some cases, the seal may become compromised if the trap/interceptor develops cracks or is otherwise damaged. The remedy for this is to replace the damaged plumbing component.

Mold

Mold and its reproductive structures, spores, are normal features of natural environments. Under most circumstances, these organisms pose little danger to healthy human beings. Under certain conditions such as high humidity (above 50%), mold may begin to grow on organic surfaces such as paper products, dry wall and ceiling tiles. Since it is difficult to completely eliminate mold from the environment, the key to controlling mold growth is to limit moisture in occupied spaces. For this reason, it is important to periodically monitor unoccupied buildings for water leaks and expedite repairs. It is also recommended that air conditioning or dehumidification equipment continue to operate in unoccupied buildings to maintain humidity levels below 50%.

To minimize the potential for mold growth in buildings that have been idle for an extended period, consider the following:

1. Conduct a walkthrough of the space to be reoccupied. While confirming the integrity of the space, remain alert for visible mold growth. Abate all mold growth visible to the human eye.

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The U.S. Environmental Protection Agency has developed practical techniques for abating mold in indoor spaces (see: <https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide>). Small infestations (less than 10 square feet) can be safely abated by custodial staff using minimum personal protective equipment and basic cleaning and disinfection techniques. Larger colonies may require professional abatement to reduce the risk of spreading contamination. If possible, seal off the supply and return air ducts in areas requiring mold abatement to reduce the risk of spreading mold to other areas of the building.

2. Reestablish normal heating, ventilation and air conditioning (HVAC) service to the building. If the HVAC system has been idle, consider having a competent individual perform a visual inspection of the air handling equipment including air filters to confirm system integrity prior to start up. If the filters are compromised, replace them before starting the fans back up. The CDC recommends operating the HVAC system for a “flush out” period of at least 48 to 72 hours before allowing occupants back into the space. During this period, adjust outdoor air dampers to the maximum settings. It is typically not necessary to clean the supply and return air ductwork prior to reoccupying idled buildings.
3. Conduct a thorough cleaning of the occupied space as ambient dust will likely have accumulated on surfaces. The CDC advises that provided no one has been in the space for the past seven days, disinfection is not necessary with respect to the COVID-19 virus. As a prudent hygiene precaution, however, it is recommended that all high contact surfaces (e.g., door knobs, faucet handles, copier controls, elevator buttons, etc.) be cleaned and disinfected per CDC COVID-19 guidelines prior to allowing employees back into the space.



For questions regarding this Risk Alert, please contact the Trust’s Risk Control Department at 215-706-0101.

Sources:

U.S. Centers for Disease Control and Prevention. “Guidance for Reopening Buildings After Prolonged Shutdown or Reduced Operation.” *U.S. Department of Health and Human Services*, 7 May 2020, www.cdc.gov/coronavirus/2019-ncov/php/building-water-system.html.

U.S. Centers for Disease Control and Prevention. “What Owners and Managers of Buildings and Healthcare Facilities Need to Know about the Growth and Spread of Legionella.” *U.S. Department of Health and Human Services*, 30 April 2018, www.cdc.gov/legionella/wmp/overview/growth-and-spread.html.

U.S. EPA. “Mold Remediation in Schools and Commercial Buildings Guide.” U.S. EPA, September 2008, www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide.