

# Legionella and Supplemental Disinfection Systems



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Legionnaires' disease is a severe type of pneumonia caused by *Legionella* bacteria. People can become sick when exposed to aerosolized water (water droplets in the air) that contains *Legionella*. *Legionella* are naturally occurring in fresh water environments, but become a health concern when the bacteria enter and grow in human-made water systems that are not properly maintained.

Outbreaks of Legionnaires' disease are often associated with large or complex potable water systems. Public health officials require an investigation into your facility if they suspect it may be the source of a Legionnaires' disease outbreak. As part of the investigation, health officials will assess the building for conditions that can promote *Legionella* growth (permissive water temperature, presence of dead-legs, low or diminishing disinfectant residual levels) and recommend control measures including the need for having a Water Management Program (WMP) in place. WMPs are an industry standard for many buildings to properly maintain the water system. **The Centers for Disease Control and Prevention (CDC) says that 9 out of 10 Legionnaires' disease outbreaks were caused by problems preventable with more effective water management.**<sup>1</sup>

Under certain circumstances, facilities choose to install a supplemental disinfection system to help maintain a disinfectant residual throughout the potable water system as part of their water management practices. Common types of disinfectant include chlorine, chlorine dioxide, monochloramine, and copper-silver ionization. The determination of whether and what type of a supplemental system is needed is a complex subject. Inappropriate selection or improper application of disinfectants may be ineffective, harmful to building occupants, damage the building water system, and could cause unintended growth of other harmful bacteria.

It is recommended that facilities consult with a water engineer with *Legionella* control experience to assess corrosion, scaling, biofilm, pH, temperature, and other physical parameters that may affect the performance of the supplemental disinfection system. A supplemental disinfection system may not be recommended or warranted for every building. If your facility decides to install a supplemental disinfection system you will need to contact NJ Department of Environmental Protection and understand the impact supplemental disinfection will have on the water quality and potential health impacts to building occupants.

**Before Installing a Supplemental Disinfection System, You *MUST* Contact NJ Department of Environmental Protection at [watersupply@dep.nj.gov](mailto:watersupply@dep.nj.gov)**

At the discretion of each state, the addition of a supplemental disinfection system may result in a facility becoming a regulated public water system, and subject to the Safe Drinking Water Act. Requirements may include training or hiring a licensed operator and performing water quality monitoring and reporting. Facilities planning on installing a supplemental disinfection system must contact [watersupply@dep.nj.gov](mailto:watersupply@dep.nj.gov) to determine current requirements.

## Health Effects Considerations

Human health risks and aesthetic effects may occur if recommended levels of disinfectants and other contaminants are exceeded. **Your facility should regularly monitor disinfection residuals and other compounds to ensure they do not exceed drinking water standards.**

- Chlorine and chlorine dioxide have Maximum Residual Disinfectant Levels (MRDLs) – the highest level of a disinfectant allowed in drinking water. The MRDL for chlorine is 4 mg/L and 0.8 mg/L for chlorine dioxide.
- Copper has an Action Level (AL), an enforceable procedure to control the level of the contaminant in water, of 1.3 mg/L. Silver has a secondary standard, a non-enforceable guideline for compounds that may cause taste, odor, or color effects, of 0.10 mg/L.
- Total Trihalomethanes and Total Haloacetic Acids, collectively known as disinfectant byproducts (DBPs), have Maximum Contaminant Levels of 80 ug/L and 60 ug/L respectively.
- Excessive DBPs can lead to increased corrosivity which can increase risk of lead leaching from plumbing materials which contain lead.

1. Centers for Disease Control and Prevention (CDC). Legionnaires' disease: use water management programs in buildings to help prevent outbreaks. Available from: <https://www.cdc.gov/vitalsigns/legionnaires/index.html>