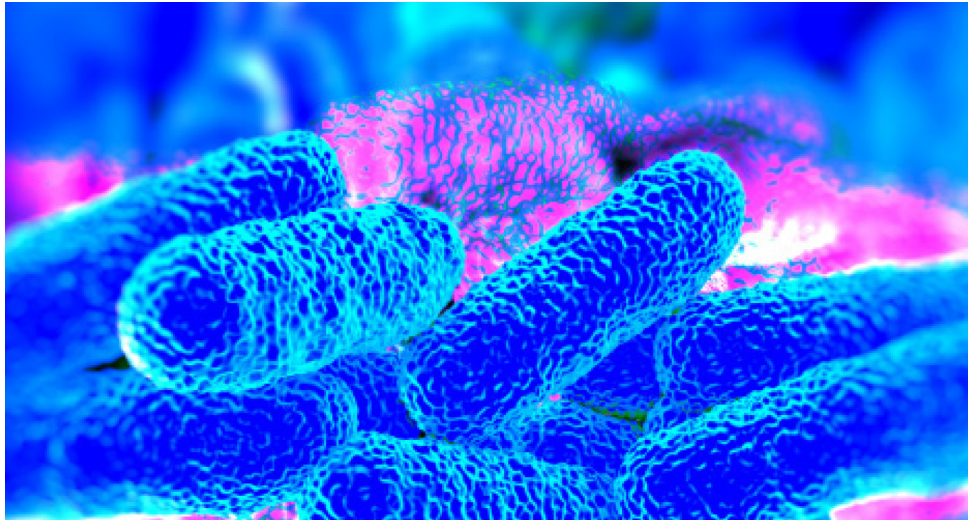


# COOLING TOWERS



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- Reducing the Risk of *Legionella* Growth

## Learning from Legionnaires' Disease Outbreak Investigations

### Dead Legs, Biofilm and Sediment Contribute to *Legionella* Bacteria Growth

In 2018, two people died and more than 50 became sick from Legionnaires' disease linked to a building's cooling tower system in lower Washington Heights. The New York City Health Department's investigation showed that not all parts of the system had been properly maintained.

Proper ongoing maintenance of a cooling tower system is critical to preventing the growth of *Legionella* bacteria, which, if inhaled, can cause Legionnaires' disease, a serious type of pneumonia that can sometimes be fatal, especially in people with underlying medical conditions.

Cooling towers are complex: In addition to the cooling towers and evaporative condensers, there may be basins, heat exchangers, chillers, valves, filtration systems, circulation pumps, equalization lines and pipes.

All components of a cooling tower system must be cleaned and treated because *Legionella* can grow on any wet surface within the system. Investigations have found that building owners and contractors hired to clean towers should pay special attention to:

**Dead legs:** a section of cooling tower systems with no flow or low circulation, or a section of pipe in which the length is greater than six times the inner diameter with low circulation. Dead legs cause water to stagnate, which creates the perfect environment for *Legionella* to grow. Dead legs must be removed or disinfected.

**Biofilm and sediment:** biofilm is a slime-like material that forms on wet surfaces. Sediment is made up of bits of mineral build-up from pipes or decaying natural matter. Biofilm and sediment can develop and settle inside

pipes and other cooling tower system components. *Legionella* bacteria need food and shelter to grow, and biofilm and sediment provide both. When biofilm and sediment are present, it becomes difficult for chemical disinfectants to kill *Legionella*.

To address biofilm and sediment, and prevent them from recurring, building owners and contractors must inspect and treat all cooling tower system components where biofilm and sediment may exist, which includes all wet surfaces. A vendor may need to dismantle some components to examine them properly. Always follow the manufacturer's recommendations.

For more information, visit [Cooling Tower Registration and Maintenance](#).



## The Power of Collaboration

### Maintaining a Cooling Tower Requires Teamwork

A strong team is needed to maintain a cooling tower system and prevent the growth of *Legionella* bacteria. Team members need to communicate clearly and understand their roles and responsibilities.

New York City's cooling tower regulations ([Chapter 8 in Title 24 of the Rules of the City of New York](#)) require, at a minimum, the following team members:

**Building owner:** the person who assigns the responsibilities for operating and maintaining the cooling tower system, understands the health risks of *Legionella* and is ultimately financially responsible should summonses be issued.

**Qualified person:** an expert in water-quality management, planning and operations who may be a New York State-licensed professional engineer, a certified industrial hygienist, a certified water technologist, or a certified environmental consultant with two years of experience in water-quality

management. This person creates the maintenance program and plan (MPP), conducts risk assessments of water systems and checks to make sure that the system water treatment is working well.

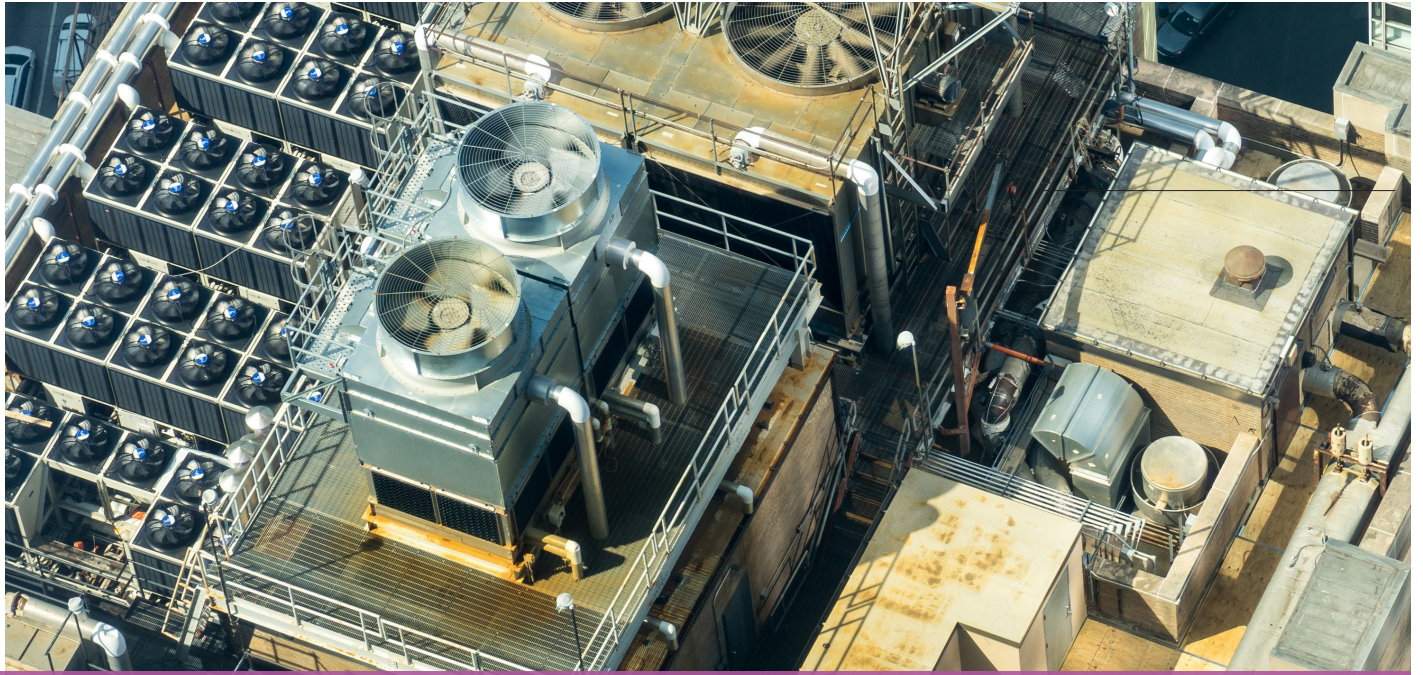
**Responsible person:** the person who performs day-to-day monitoring, maintenance and operational tasks, including reporting any out-of-the-ordinary system conditions to the qualified person. All responsible persons must be trained by the qualified person.

**Biocide applicator:** a commercial pesticide applicator or technician who has been certified as a Category 7G applicator by the [New York State Department of Environmental Conservation](#).

**Laboratory:** a laboratory certified by the New York State Department of Health Environmental Laboratory Approval Program (ELAP) to perform *Legionella* culture testing.

The building owner can also hire third-party vendors – consultants, service companies or management companies – to join the team. The owner must make sure that these vendors are identified in the MPP, understand their roles and responsibilities and communicate clearly with other team members.

For more information, read [Building Your Cooling Tower System's Management and Maintenance Team](#) and complete the [Responsibilities and Resource Checklist](#) to determine who makes up your team. To find these materials in Spanish, Simplified Chinese, Traditional Chinese and Vietnamese, visit [Cooling Towers: Maintenance Program and Plan](#) and scroll down to **Additional Resources**.



## Reducing the Risk of *Legionella* Growth

To reduce the risk of *Legionella* and other types of bacteria from growing in a cooling tower system, the owner and qualified person must:

- Ensure water treatment is being done, including maintaining a chemical residual for bacteria control.
- Double-check automatic controls for water treatment in person.
- Regularly review and update the management plan and operational records.

In addition, the owner or qualified person must make sure that the individuals conducting the cleaning and disinfection:

- Follow the manufacturer's recommendations for cleaning each piece of equipment to be sure all parts are cleaned. Some system components may need to be dismantled for proper cleaning.

- Check that all wet surfaces of the entire cooling tower system are maintained and treated.
- Visually check and address any signs of fouling, rusting and debris in all components of the cooling tower system, including:
  - Cooling tower and evaporative condenser
  - Basins
  - Heat exchangers
  - Chillers
  - Valves
  - Filtration systems
  - Circulation pumps
  - Equalization lines
  - System piping
  - Seasonal bypass lines
  - Dead legs (areas with low or no water flows)



To protect against *Legionella* growth, you must fully monitor, maintain, clean and disinfect the entire cooling tower system, not just the cooling tower. For more information about reducing the risk of *Legionella*, read our [Cooling Tower Compliance Guidance](#).