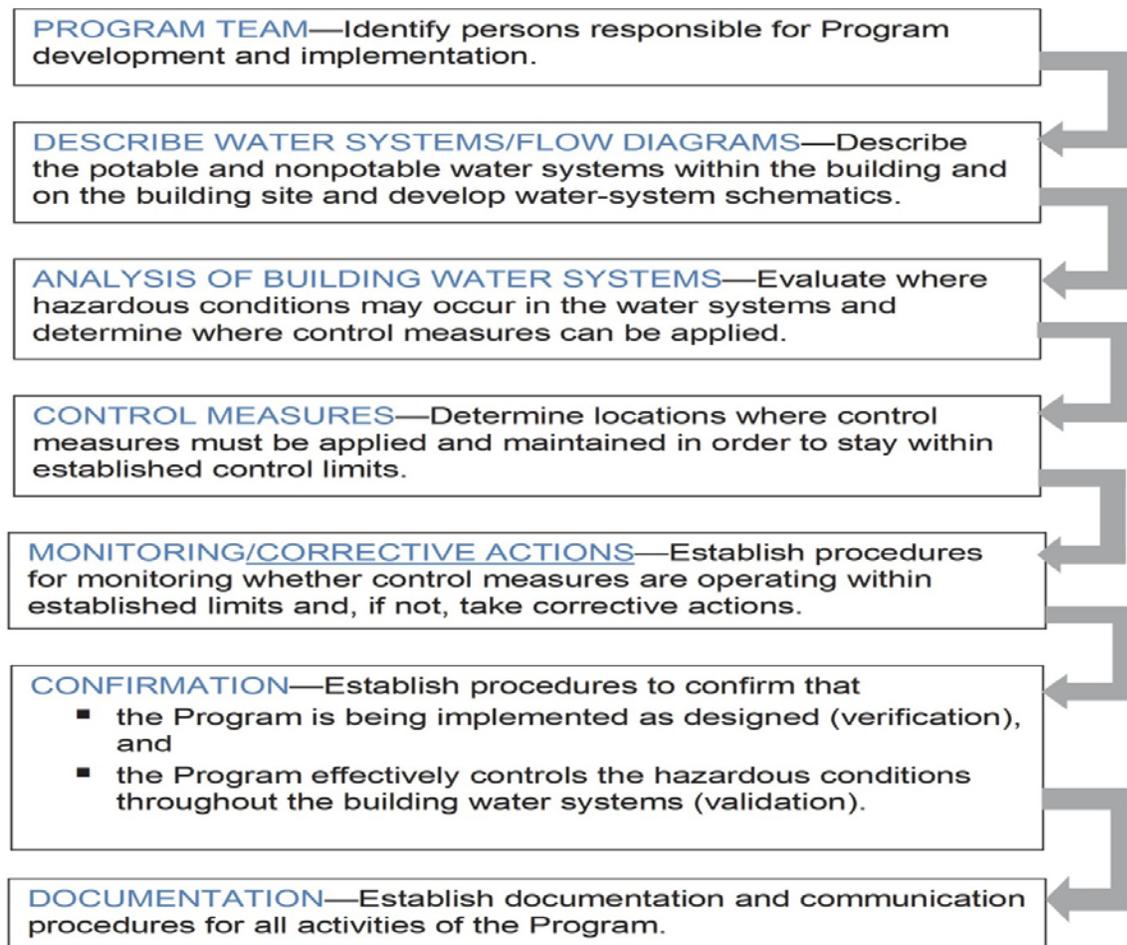


FAQ's Regarding ANSI/ASHRAE Standard 188-2015 for Control of Legionellosis Associated with Building Water systems

For the past several years the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) has been working to develop a standard protocol for control of legionella in commercial building water systems. The standard, entitled *Legionellosis: Risk Management for Building Water Systems*, or (ASHRAE 188-2015), was finalized in July, 2015. This voluntary program will help define the standard of care to be used by building owners and managers in assessing the risks associated with waterborne pathogens. The basic elements of the standard are as follows:



The complete and finalized standard is available at <http://www.ashrae.org> (ASHRAE). While there are several consultants available to assist in developing a program that conforms to the new standard, there is no requirement to engage a third-party and many facilities will be able to complete the task without outside assistance.

The following is a list of some of the questions I have received regarding the standard.

1) **Am I required to develop a program that complies with ASHRAE 188?**

Answer: ASHRAE 188 is a voluntary standard. Therefore, it is not a “requirement” at this time. The standard has been developed over several years by a collaborative industry and governmental panel. As such, it will certainly become a part of the “standard of care” for controlling legionella and waterborne pathogens in building water systems. From a risk-management perspective – and more importantly for the safety and health of building occupants – compliance will be increasingly important now that the standard has been released in its final form.

2) **Does ASHRAE 188 apply only to cooling water?**

Answer: No. In fact, a significant number of legionella outbreaks are associated with potable water systems, and other types of water systems such as whirlpool spas, decorative fountains, and misters. Accordingly, the program requires a risk assessment of all water systems in the building. Of course, many water systems will be assessed a low-risk factor and will require minimal control measures.

3) **What is the minimum size building to which the ASHRAE standard will apply?**

Answer: The standard excludes single-family residential buildings and is targeted at human-occupied commercial, institutional, multiunit residential, and industrial buildings. Sections 5.1 and 5.2 of the standard provide specific guidance regarding the types of systems, and risk factors that determine applicability.

4) **Are there any references that I can use to learn more about Legionellosis?**

Answer: Yes. There are many references on the subject, which may be helpful. To get started, we suggest the following:

- *Legionella Control in Health Care Facilities*
Matt Frieje, www.hcinfo.com
- *Legionella and the Prevention of Legionellosis*
World Health Organization - this is a free download at
www.who.int/water_sanitation_health/emerging/legionella.pdf
- *Prevention of Healthcare-Associated Legionella Disease and Scald Injury From Potable Water Distribution Systems*
Veterans Health Administration, VHA Directive 1061, August 13, 2014

5) **Am I required to test for legionella bacteria to comply with the program?**

Answer: There is no “requirement” to test for legionella in the standard. However, the plan requires that a risk assessment is performed, critical points are identified and validation of control be confirmed. Depending upon the level of risk, validation may be achieved in various ways. For many buildings, particularly health care facilities, and other buildings with high-risk occupants, it is likely that legionella testing on certain systems will be part of the program.

6) **If we test for legionella, how often should we do it?**

Answer: There is currently no universally accepted frequency for monitoring legionella bacteria. Dr. Janet Stout, one of the leading experts in the field of Legionellosis, has suggested that initial screening should be performed on critical systems and quarterly monitoring would be prudent to confirm control. Another reference published by the Veterans Health Administration (VHA Directive 1061, August 13, 2014) states that quarterly legionella testing must be performed on potable water systems for VHA buildings in which patients, residents, or visitors stay overnight. While there are differing opinions on the issue, there may be directives, or guidelines that apply to your particular circumstance, and we anticipate additional guidance as ASHRAE 188 is implemented and matures.

7) **How much legionella is considered “safe“ in my water?**

Answer: Legionella bacteria are commonly found in our environment. As such, it's likely that it will be present, at some level, in commercial building water systems. Also, there are certain conditions that will amplify its growth and some occupants that will be at higher risk of infection. While it would be impossible to determine a “safe” level with absolute certainty, a practical control program will establish action steps to be taken based on the number of positive samples, the level of bacteria present, and the associated risk to occupants.

Common action levels for are as follows:

Legionella (cfu per ml)	Cooling Tower	Domestic Water
Detectable but < 1	A	B
1 – 9	B	C
10 – 99	C	D
100 – 999	D	E
1,000 +	E	E

Key:
A = Low level of concern.
B = The legionella count represents little concern but indicates the system is a potential amplifier for legionella
C = Low but increased level of concern. Disinfection should be considered
D = Uncommonly high levels. Approaching levels that may cause outbreaks. Disinfect systems.
E = Very high levels. Outbreak potential. Disinfect systems immediately.

**Criteria Established by PathCon Laboratories for Interpreting Results of Samples Taken from areas Occupied only by Low-Risk Individuals.*

8) **What methods are available to test for legionella?**

Answer: At this point, the best practice for legionella testing is still a culture procedure performed by a certified laboratory, which requires incubation time. Like any other analytical procedure, proper sampling technique is important and the sample should be processed by a competent laboratory. Expect to pay in the range of \$200 for these tests, plus the cost of shipping the sample. Results are typically available in about one week. While not recommended for validation of legionella control programs, field tests are also available, which yield results in approximately 30 minutes. One example of a legionella field test can be found at www.hydrosense.biz.

Your CH₂O representative can assist you in gathering samples to be analyzed by an independent, certified laboratory.

9) **I already test for total bacteria in my cooling tower, do I still need to test for legionella?**

Answer: CH₂O recommends the use of total bacteria testing in cooling water as an overall indication of biological control. However, total bacteria counts taken on bulk water may not correlate directly with legionella levels. Therefore, each facility will want to assess risk factors, and determine if periodic legionella testing is prudent.

10) **Are all Legionella bacteria the same?**

Answer: No. There are several different serogroups/subtypes of legionella bacteria. Some of which are rarely associated with disease incidents. The vast majority of legionellosis cases are caused by *Legionella Pneumophila, Serogroup 1*.

11) **What systems are of greatest concern for legionella?**

Answer: Legionella bacteria may be present in a variety of water systems. However, it tends to multiply more effectively in the temperature range of 70-140°F, so these systems would be of higher concern than cold or hot water systems (i.e. greater than 140 degrees). Legionella bacteria also tend to thrive in bio-film or in stagnant water, so special care should be taken to avoid or correct these conditions.

12) **What is the most effective treatment for legionella bacteria?**

Answer: Under laboratory conditions legionella bacteria are relatively easy to kill and a variety of commonly used biocides are effective. However, a recent study conducted by Dr. Richard Miller of Environmental Safety Technologies, Inc. showed that up to 11% of cooling towers with a biocide treatment program in place had legionella bacteria present. The implication is that field conditions are more challenging than the laboratory when it comes to controlling legionella.

For cooling towers and storage tanks, federal OSHA guidelines recommend regularly cleaning the systems to minimize biofilm and to employ a routine biocide treatment program. Many facilities employ an oxidizing biocide alternating with a non-oxidizing biocide. Other systems will alternate two non-oxidizing biocides, and another option is to supplement the biocide program with bio-dispersants.

Potable water systems are generally treated with low-levels of an oxidizing material such as chlorine, monochloramine, or chlorine-dioxide. Copper-silver ionization, or heat sterilization may also be part of the treatment strategy for potable water. It is important to insure the materials are EPA approved for the application and levels are maintained within safe drinking water limits.

Regardless of the treatment method selected, the facility should establish validation procedures to assure adequate biological control.

13) **Are there consultants who can assist with establishing a water management program?**

Answer: There are several consultants who specialize in this area, including the following:

Matt Frieje, H.C. Information Resources, Inc.
Janet Stout, Ph.D., Special Pathogens Laboratory

14) **Can CH₂O assist in developing your legionella control program?**

Answer: Yes. CH₂O personnel are knowledgeable in treatment of water systems to assist you in controlling biological growth, and selected personnel have received training to conduct building surveys as part of developing a legionella control program. As such, they can serve as a member of your implementation team. However, it is important to note that the responsibility for developing and implementing the control program, and any legionella testing lies with the building owner/operator.

Conclusion:

The voluntary ASHRAE Standard for establishing legionella control programs in building water systems was released in its final form in July, 2015. While the standard is voluntary, it will establish a “standard of care” within the industry. Prudent building owners will review the standard, assess risks, and determine if implementation is appropriate for their situation. CH₂O personnel can assist you in sampling for legionella and conducting a survey of your facility to support you in developing a control program.

CH₂O, Inc. has provided this material as a general reference for those who are establishing a legionella control program. We make no claims that any, or all, of the suggestions will prevent Legionnaires’ disease, nor do we assume any liability for damages associated with such outbreaks.