

A close-up photograph of a vibrant green leaf with several clear water droplets resting on its surface. The background is a soft, out-of-focus green.

# EnviroScope

ENVIRONMENTAL WHITE PAPER FOR ALLIED WORLD POLICYHOLDERS

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## **Developing a Legionella Water Management Program**

Developing a Legionella Water Management Program allows property owners to demonstrate a defensible, proactive approach toward managing environmental and toxic tort liability arising from a building's water supply, distribution and cooling systems. Since the introduction of the ASHRAE 188 Standard in 2015, there have been recommended guidelines in place for identifying steps to be taken to formulate and develop such a plan. An earlier 2015 EnviroScope white paper on "Risk and Liability Minimization for Building Water Quality and Legionella Issues," presented before the finalization of ASHRAE 188, introduced the history, epidemiology, proximal sources and causes of legionella bacteria in building water systems. In continuation of this subject matter, this white paper summarizes the requisite next steps as specified in the ASHRAE 188 Standard intended to assist property owners who are subject to the standard and have not already taken appropriate steps to prepare a Water Management Plan to begin doing so.

### **Background**

The ASHRAE 188 – 2015 Standard: Legionellosis: Risk Management for Building Water Systems was designed as code-ready tool for adoption by local and state regulations. The standard describes methods to identify environmental conditions that promote the growth of legionella and provides recommended best management practices for monitoring and controlling sources of legionella bacteria in building water. Within ASHRAE 188, a separate Annex A has been incorporated to address minimum risk management requirements specific to healthcare facilities. Since its initial release, the standard has been periodically updated to include Addendums A-E pertaining to building water system design and risk management plan certification requirements. Related publications and guidelines released by the Center for

Disease Control (CDC), U.S. Department of Health & Human Services, Centers for Medicaid and Medicare Services (CMS) and the City of New York (NYC) have also referenced ASHRAE 188 Standard, in part or whole, as the basis for ensuring building water systems meet best in class water quality risk management practices. While adoption of the ASHRAE standard remains voluntary for most, CMS has mandated adherence to the standard for healthcare facilities as a condition for maintaining accreditation status, and the New York requirements are also mandatory for buildings falling within the purview of ASHRAE 188. Furthermore, some local jurisdictions such as Clark County, Nevada, Dade County, Florida and others have regulations which must be complied with even more stringent than ASHRAE requirements.

### **Water Management Plan**

The most significant component of achieving conformance to the ASHRAE 188 Standard is the performance of a risk assessment and development of a Hazard Control Plan which form the basis for the Water Management Plan (WMP) specific to each type of building and any associated features deemed applicable under the ASHRAE 188 Standard, including:

- Multiple housing units with one or more centralized potable water heater systems,
- Buildings more than 10 stories high (including any levels that are below grade),
- Healthcare facilities where patient stays exceed 24 hours,
- Buildings housing or treating occupants receiving treatment for burns, chemotherapy for cancer, solid organ or bone marrow transplantation,
- Buildings housing or treating occupants that are immunocompromised, taking drugs that weaken the immune system, have renal disease, have diabetes or have chronic lung disease, or
- Buildings identified by the owner or designee as being for the purpose of housing occupants over the age of 65 years,
- Buildings with open and closed-circuit cooling towers or evaporative condensers that provide cooling and/or refrigeration for the HVAC&R system or other HVAC systems or devices in the building,
- Presence of whirlpools or spas either in the building or on the site, or
- Ornamental fountains, misters, atomizers, air washes, humidifiers or other devices that release water aerosols in the building or on the site.

### **Establish Program Team**

For those buildings subject to the ASHRAE 188 Standard, the first step in developing the Water Management Plan is the designation of a qualified multi-disciplinary Program Team including building owners and managers, engineering, environmental, administrative, infection prevention (healthcare), legal, and risk management personnel along with outside

contractors/consultants including water systems design, treatment, and testing professionals. Ideally, this team should be readily available and meet on a regular basis to address issues such as any building renovations impact to water systems, maintenance reports, and disinfection verification/validation procedures if control parameters under the WMP have been exceeded during the prior testing period.

### **Document Water Distribution Network**

Once the Program Team is assembled, they shall collaboratively identify and describe potable and non-potable water systems within the building, including:

- The locations of incoming and end point potable and non-potable water systems,
- The location of water processing equipment and device(s) receiving water which is being conditioned, stored, heated, cooled, recirculated and delivered to end point users.

For newer buildings, as-built drawings that are accurate and reflective of current conditions can be relied upon for depicting the water supply and distribution system network. For older buildings, mapping the buildings water supply will entail locating known (visible) plumbing distribution lines and risers leading from the point where water first enters the building, supplemented by actual or inferred plumbing distribution services which have been encountered during repairs, upgrades or additions to the buildings plumbing system. Since older buildings typically undergo improvements and renovations, the Program Team should secure available as-built plumbing configuration details documenting changes to plumbing systems which are known to have been made following initial construction. If any areas of uncertainty exist, these should be identified so that they can be subsequently inspected and verified.

This information will then be consolidated and graphically described in a generalized step-by-step process flow diagram that provides sufficient detail to depict features where hazardous conditions may exist in the building water systems. The flow diagrams should include the following:

- Identification/location of water system components/devices (i.e. cooling towers, water heaters, boilers, fountains, ice machines, whirlpools, etc.),
- Backflow preventers, water softeners, heat exchangers, storage/expansion tanks, central mixing valves,
- Waste water disposal locations,
- Inactive lines (dead legs) or other areas where poorly circulated water may reside,
- Areas where key points of risk and quality control monitoring devices (i.e. temperature, chemistry, flow, biofilms, etc.) are or can be installed.

External building factors such as construction, water main breaks, municipal water quality including sedimentation should also be taken into consideration as should the potential for occupant exposure. The flow diagram may need to be periodically amended when any changes occur that can impact key areas of control.

### **Establish and Monitor Control Points**

Based upon the preceding findings, the Program Team shall develop a Hazard Control Plan to identify readily accessible locations in the building water system where control points can be established and monitored to manage potentially hazardous system conditions within the building water systems. Control measures are then prescribed for each control point identifying a minimum value, maximum value, or range of values to which a chemical (i.e., residual disinfection) or physical (i.e., temperature) parameter must be maintained within the established control limits. For water processing equipment such as cooling towers, the control measure may also include establishing a pre-determined inspection and maintenance frequency documented in a system maintenance program consistent with the ASHRAE 188 Standard. The WMP shall include the means, methods and frequency for monitoring activities and all monitoring results shall be documented in the plan for verification of its effectiveness, and include steps to be taken in instances where variations in control measures are identified which require corrective action.

### **Implement Corrective Action**

Attempts to correct control measure variances outside the established minimum and maximum ranges should first be made through readily available means, either through physical methods such as increasing and monitoring the hot water temperature, or by chemical methods such as maintaining residual disinfection within the affected riser, device or distribution line of the water supply system. Where these initial methods fail to restore the desired control measure, it may be necessary to consider supplemental methods of corrective action using point of use filters or engaging a water treatment professional to assist in designing and implementing additional control measures or alternative methods of disinfection. In these instances, the WMP should be revised where necessary to reflect the additional control measures being employed to achieve compliance at the control points. In non-healthcare/long term care facilities, where the effectiveness of the corrective action is required to be validated or remains uncertain, the collection and analysis of water samples using ISO Method 11731:1998 should be performed by individuals with experience in this type of sample collection and analysis. Under CMS 17-30, healthcare facilities are required to perform environmental sampling to maintain CMS status even in the absence of disease and the State of New York also has requirements for environmental water sampling which must be complied with.

## Available Online Resources

There are a number of online resources available to individuals responsible for developing a Legionella Water Management Plan. These include:

ASHRAE/ANSI – The ASHRAE 188 – 2015 Standard: Legionellosis: Risk Management for Building Water Systems is available for purchase and immediate download online at:

[http://www.techstreet.com/standards/ashrae-188-2015?utm\\_campaign=tracker&utm\\_medium=email&utm\\_source=internal&utm\\_term=ASHRAE%20188-2015&product\\_id=1897561](http://www.techstreet.com/standards/ashrae-188-2015?utm_campaign=tracker&utm_medium=email&utm_source=internal&utm_term=ASHRAE%20188-2015&product_id=1897561)

The ASHRAE 188 amendments/errata Addendums A- E are also available for complimentary download to registered users.

Center for Disease Control (CDC) – The CDC provides a number of available online resources at: <https://www.cdc.gov/legionella/index.html> including the Toolkit for Developing a Legionella Water Management Plan, educational materials such as Environmental Aspects of Investigating Legionellosis Outbreaks, and Fact Sheets about Legionella and Hot Tubs

(<https://www.cdc.gov/healthywater/swimming/swimmers/rwi/respiratory-infections.html>)

U.S. Department of Health & Human Services, Centers for Medicaid and Medicare Services (CMS) – The CMS released a new mandate in June 2017 requiring healthcare facilities to adopt, implement and adhere to risk management programs using Water Management Plans for the control of Legionellosis: <https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-17-30.pdf>

New York City (NYC) Building Department– Adopted under the NYC Health Code following a 2015 outbreak traced back to improperly maintained cooling towers, New York City is the first major metropolitan city in the country to require owners of buildings with cooling towers to register and annually certify compliance with maintenance requirements, outlining the specific requirements at: <https://www1.nyc.gov/site/buildings/safety/cooling-tower-registration.page>

<http://www1.nyc.gov/site/doh/health/health-topics/cooling-towers.page>

Depending on the coverage terms available under the various environmental insurance programs, existing Allied World insured's may also be eligible to receive Water Management Plan templates and technical consultation services offered through presentation of this white paper by contacting AWAC Services Risk Management Department at Risk Management for Allied World Policyholders

[RiskManagement@awacservices.com](mailto:RiskManagement@awacservices.com).

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