

INTRODUCTION

Scope of the Water Management Program Template

Water Management Programs (WMPs) are now an industry standard for many buildings in the United States to minimize the risk for *Legionella* and other opportunistic pathogens associated with the building water systems and devices.

This purpose of this document is to serve as a template for facilities when developing a WMP. The template is based on the framework outlined in ANSI/ASHRAE Standard 188 *Legionellosis: Risk Management for Building Water Systems* and should be used as a guide. The template will need to be adapted to the unique characteristics of each individual facility.

The written WMP is meant to be designed as living document and maintained by the Facility's WMP Team. The Facility's WMP Team is responsible for the development, implementation, and maintenance of the WMP. Recommendations provided by the New Jersey Department of Health (NJDOH) are minimum requirements for risk management, merely considered examples, and are not meant to be considered exhaustive.



Disclaimer: This resource focuses on primary prevention. Guidance for responding to cases of legionellosis are not within the scope of this document. NJDOH welcomes feedback regarding this template (PreventLD@doh.nj.gov).

Target Audience

This template is intended for use by owners and managers of human-occupied buildings and those involved in the design, construction, installation, commissioning, operation, maintenance, and service of centralized building water systems and components.

This Template does not require special training or certification in hazard analysis, risk assessment, or risk management methodologies. The WMP Team should have knowledge of the building water system design and water management as it relates to *Legionella* bacteria and other opportunistic premise plumbing pathogens. Knowledge related to legionellosis can be obtained through peer-reviewed informative documents such as CDC's Toolkit for Controlling *Legionella* in Common Sources of Exposure.

FACILITY SURVEY

Survey Purpose

ASHRAE Standard 188 requires each facility to be surveyed to determine if the facility contains any devices or characteristics which could increase risk for legionellosis. ASHRAE Standard 188 requires this survey to be conducted at least annually and any time renovations, additions, or modifications are made to the building.

Survey Questions

Does the facility have one or more of the following devices?	Yes	No
Open- and closed-circuit cooling towers or evaporative condensers for air-conditioning, refrigeration, industrial use, or for any other purpose		
Whirlpools or spas, either in the building or on the site		
Ornamental fountains, misters, atomizers, air washes, humidifiers, or other water systems or devices that release water aerosols in the building or on the site		
If you answered yes to any of the above questions, then you need a Water Management Program for that specific device.		

Does the facility have one or more of the following characteristics?	Yes	No
Multiple housing units with one or more centralized hot water system		
Primarily houses occupants over the age of 65 years		
More than ten (10) stories high (including any levels that are below grade)		
Healthcare facility where patient stays exceed 24 hours		
Contains one or more areas for the purpose of housing or treating occupants receiving treatment for burns, chemotherapy for cancer, or solid organ transplantation or bone marrow transplantation		
Contains one or more areas for the purpose of housing or treating occupants that are immunocompromised, at-risk, are taking drugs that weaken the immune system, have renal disease, have diabetes, or have chronic lung disease		
If you answered yes to any of the above questions, then you need a Water Management Program for your building water system.		

Water Management Program Template

Facility Name:

Address:

Phone Number:

Email:

Plan Preparer Name:

Plan Preparer Organization:

Phone Number:

Email:

Effective Date:

Last Revised Date:

Last Revised By (Name):

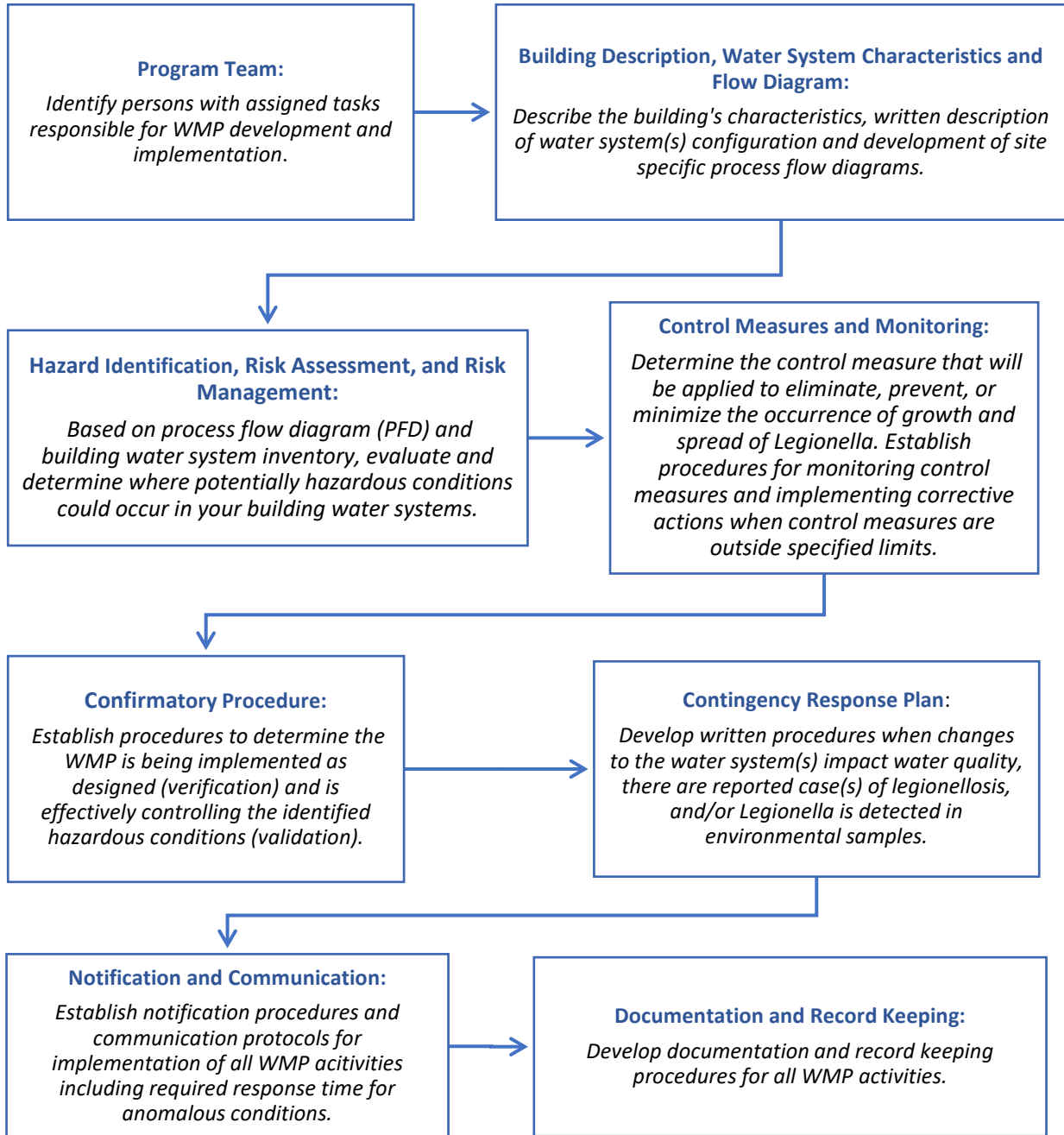
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Water Management Program Development

When a facility survey determines the presence of devices or facility characteristics which could increase risk for legionellosis, then the development and implementation of a Water Management Program (WMP) in accordance with ASHRAE Standard 188 is required to manage risk of legionellosis for those identified devices or facility characteristics. A summary of the steps required for the development and effective implementation of the WMP is described below.

Key Elements of a Water Management Program



Water Management Program Team Roles and Responsibilities

Water Management Program Team

Identify the persons on the WMP Team responsible for developing and implementing the WMP and the team members' tasks. Consider who might be a part of your multidisciplinary WMP Team that may include the building owner, manager/administrator, maintenance or engineering, infection preventionist, clinician, risk management, industrial hygienist, water treatment specialist, environmental consultant, environmental microbiologist, local health department representative, and water utility representative.

Identify a primary program manager for the team and all associated team members responsible for the implementation of the WMP. Include contact information to facilitate effective communication and clearly detail the roles and responsibilities for each team member.

Program Team and Responsibilities

Name	Title	Organization	Contact Information (phone & email)	Roles and Responsibilities ¹

1. Individually describe the roles and responsibilities of each WMP Team member, including tasks they are responsible for performing, verifying, or documenting

Building Description and Water System Characteristics

The foundation of an effective Water Management Program (WMP) is a clear understanding of your building water systems. The following sub-sections will help you gather information you will need when designing your WMP. It is recommended to work with your maintenance or engineering staff, who are knowledgeable about the building water system, when completing this section. You may wish to review your facility's design, as-built, and construction drawings (which typically includes the building's plumbing riser diagram and water system distribution) as these will provide additional information.

General Building Description and Occupancy

List the buildings to be included in the WMP and the characteristics and water systems associated with each building. Add additional rows to include more buildings as needed.

Building Name	Year Built	No. of Floors	No. of occupants <i>(Including staff, residents, tenants, visitors)</i>	No. of rooms or units that can be occupied overnight	Number of Water Systems Per Building					
					Potable Water (Cold)	Potable Water (Hot)	Cooling Tower	Pool or Spa	Ornamental Water Features	Other Aerosol Generating Devices

Building Services Description

List the purpose and services provided on each floor of the buildings included in this WMP.

Building/Floor	Purpose/Services Provided
<i>Example: Basement</i>	<i>Includes mechanical room (boilers, hot water tanks), storage, laundry, and maintenance shop. Staff access only.</i>
<i>Example: Floor #1 (ground)</i>	<i>Front desk and lobby, office use, meeting space, community room, therapy room, gym, kitchen</i>
<i>Example: Floor #2 - 6</i>	<i>Apartments, residential units, guest rooms, patient rooms, Dialysis unit, maternity ward</i>

Building Water System Inventory

Complete this table for each building to be included in your Water Management Program.

[Insert Building Name Here]		Response
Incoming Cold Water	Source(s) of potable water for the building (municipal, private well, other)	
	Primary treatment process for potable water (chlorine, chloramine, UV)	
	Location where the potable water enters the building, for example first floor mechanical/water meter room If there are multiple entry points, describe each one	
	Backflow prevention assemblies/devices If yes, list the make, model, type (e.g., reduce pressure zone, double check valve assembly, etc.), and location of each backflow prevention assembly/device	
	Pressure booster pumps on the potable water entering the building (yes/no)	
	Pressure tank(s) on the potable water entering the building (yes/no)	
	Pressure reducing valves and/or zones on the potable water entering the building (yes/no)	
	Non-pressured holding tanks or cisterns (yes/no) If yes, describe model and manufacturer, water source, materials of tank, location, and total capacity (e.g., gallons)	
	Supplemental disinfection systems for potable cold water (yes/no) If yes, describe the injection location, areas served, treatment type, dose rate (if chemical), target residual at point of use (if chemical), and if operated continuously or intermittently	
Filtration and Treatments	Strainers or filters at the point where the potable water enters the building (yes/no) If yes, model and manufacturer	
	Filters at points of use (yes/no) If yes, model, manufacturer, and type (e.g., carbon, 0.2-micron microbiological)	
	Water softener/conditioner systems (yes/no)	

[Insert Building Name Here]		Response
	If yes, model and manufacturer, location and type of water (hot/cold or both) conditioner	
Plumbing	Material of plumbing pipes (copper, galvanized steel, polyvinyl chloride, PEX)	
	Pipe insulation (yes/no) If yes, describe extent (hot, cold or both pipes insulated)	
	Water hammer arrestors (yes/no) If yes, number of arrestors and locations installed	
	Number of identified dead-legs	
	Location of water heaters	
	Number of water heaters	
Potable Hot Water System	Type of water heaters (Boiler, heat exchanger, instantaneous heater, conventional water heater, solar heating)	
	Model number and manufacturer of hot water heaters	
	Installation date of water heaters	
	Set temperature of water heaters	
	Number of hot water storage tanks	
	Location of hot water storage tanks	
	Total capacity of each hot water storage tank	
	Model number and manufacturer of hot water storage tanks	
	Installation date of hot water storage tanks	
	Set temperature of hot water storage tanks	
	Expansion tanks for potable water (yes/no) If yes, number of expansion tanks, locations, installation dates, design (flow through or non-flow through), and model and manufacturer	
	Number of hot water return circulatory pumps	
	Areas served by hot water system	

[Insert Building Name Here]		Response
	If multiple hot water system within a single building, specify floors and areas served by each hot water system	
	Number of thermostatic mixing valves and location (centrally located or at points of use)	
	Set temperature of thermostatic mixing valves, if applicable	
	Maximum hot water temperature at the point of delivery permitted by state/local regulations	
	Hot water return temperature, if applicable	
	Supplemental disinfection systems for potable hot water (yes/no) If yes, describe the injection location, areas served, treatment type, dose rate (if chemical), target residual at point of use (if chemical), and if operated continuously or intermittently	
	Cogeneration system for auxiliary thermal heating of potable water system(s). If yes, provide location installed and type of water (hot supply, hot water return or cold water makeup to the hot water system)	
Domestic Water Outlets	Number of sink faucets (including all restrooms, janitors' sinks, kitchen sinks, hair salons, etc.) As applicable, describe number of aerators, point-of-use mixing valves, flow restrictors, and automatic faucets and areas located	
	Number of affixed and handheld showers (including private, semi-private and common shower rooms) As applicable, indicate if showers are equipped with point of use mixing valves	
	Number of bathtubs (including private, semi-private and common bathing rooms) As applicable, indicate if showers are equipped with point of use mixing valves	
	Number of hydrotherapy tubs	
	Number of drinking fountains	
	Number of eyewash stations (connected to domestic supply)	
	Number of emergency showers	

[Insert Building Name Here]		Response
	Number of dishwashers	
	Number of beverage machines (connected to domestic supply)	
	Number of ice machines As applicable, list the location, type of filter system, model and manufacture of each ice machine	
Other Water Systems	Emergency fire protection system type (wet/dry/other) If wet, describe if system is fed by its own main or if it branches off the same main as the potable water system Describe the type of cross-connection control(s) such as RPZ/DCVA, etc.	
	Landscape irrigation systems (yes/no) If yes, describe function and location Describe if system is fed by its own main or if it branches off the same main as the potable water system Describe the type of cross-connection control(s) such as RPZ/DCVA, etc.	
	Ornamental fountains, misters, or other water features (yes/no) Describe design, size, location, source of water, continuous or intermittent operation, filter type, chemical feed, and the presence of any heat source (e.g., incandescent lighting)	
	Cooling towers (yes/no) If yes, are drift eliminators used? (yes/no) Describe purpose (e.g., air conditioning, industrial processes), equipment, location, date of installation, if operation is seasonal or annual, manufacturer/model number of cooling tower(s) and chemical/biocide treatment <i>See appendix for supplemental cooling tower tables</i>	
	Recreational water (e.g., swimming pools, hot tubs, etc.) (yes/no) If yes, describe location, type of recreation water system, max bather load, filter type, and chemical feed for recreation water systems, as applicable <i>See appendix for supplemental hot tub tables</i>	

[Insert Building Name Here]	Response
On-site water reuse system(s) (e.g., rainwater harvesting, stormwater runoff, gray water, steam condensate, irrigation process water, etc.) (yes/no) If yes, describe type of reuse system(s), usage, treatment application, as applicable	
Steam/sauna rooms (yes/no)	
Water spray grounds (yes/no)	
<i>Add other systems as applicable to the facility</i>	

Building Water System Description

Provide a written description of the potable and nonpotable water systems. This description should include details but not limited to the following:

- The location where the main incoming water supply is received
- The locations of water processing equipment and components
- How hot and cold-water is processed, conditioned, stored, heated, cooled, recirculated, distributed throughout the building both vertically (up and down between floors or stories) and horizontally (across floors).
- Total number of hot and cold-water supply and return risers with designation of each endpoint outlets or fixture served by each riser stack.
- Locations of endpoint uses of potable and nonpotable water systems

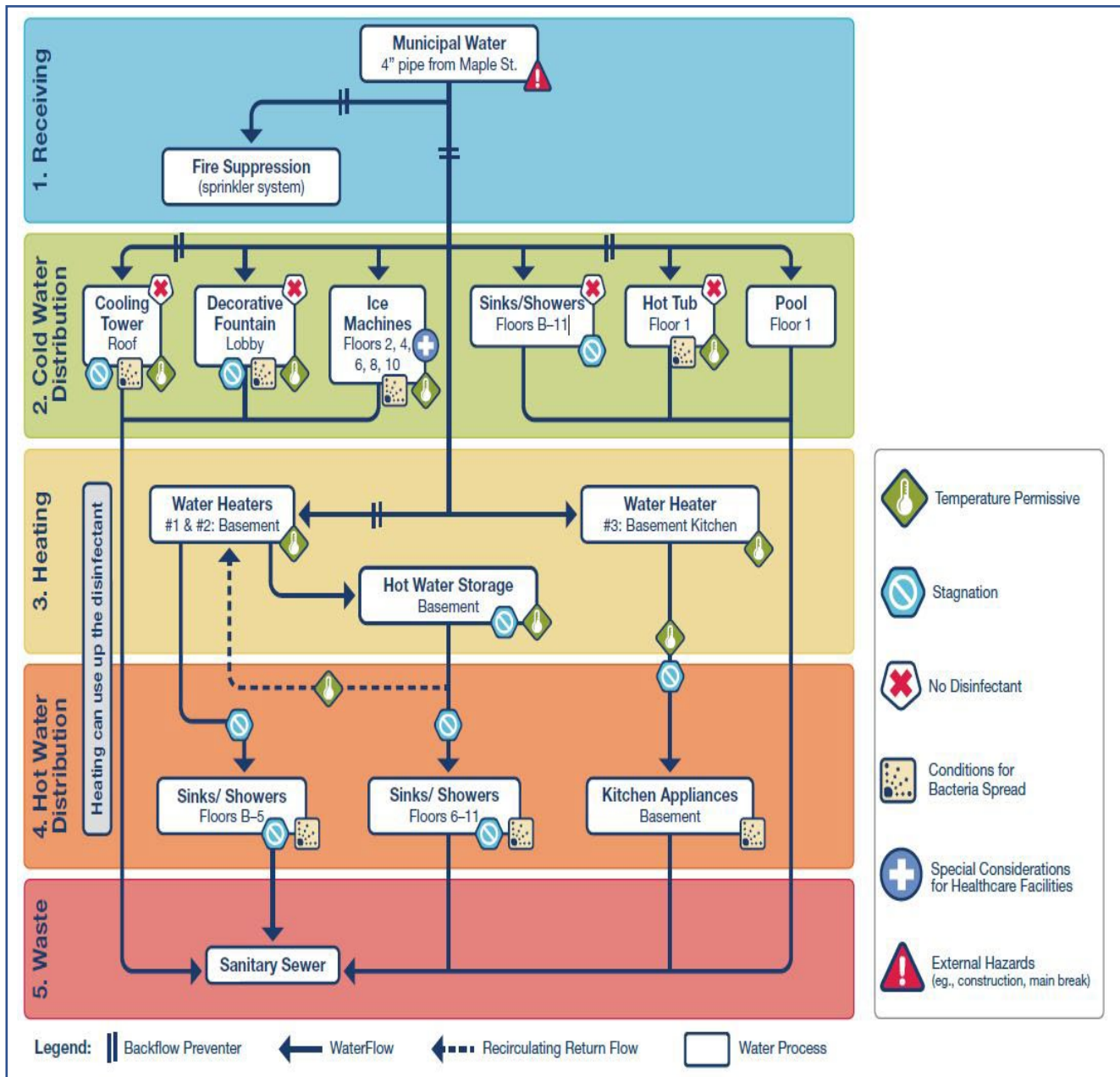
Healthcare facilities should be sure to include descriptions of:

- Medical procedures or devices that may expose patients to water droplets, such as hydrotherapy tubs, respiratory therapy equipment, humidification devices and dental unit water lines,
- Clinical support areas (including dietary and central supply) which could contribute to spread by aspiration Include all components and devices that can contribute to Legionella growth and spread,
- Areas with patients more vulnerable to infection (e.g., bone marrow transplant units, oncology floors, or intensive care units).

You should also develop an ongoing dialogue with your drinking water provider so that you are aware of changes that may affect your building's water supply.

Building Water System Process Diagram

Provide a simple schematic that shows how hot and cold-water flows throughout the building and include locations of the major water processes and components with details that enables the identification, analysis, and management of risk associated with Legionella growth and spread in the building water systems. The Program Team must ensure that process flow diagrams are representative of the systems as-built and are facility specific. An example is provided below.



Hazard Identification, Risk Assessment, and Risk Management

This section of the Water Management Program (WMP) identifies areas of your building water system where potentially hazardous conditions could result in the growth and spread of Legionella. Common hazards that must be considered include permissive water temperatures, water stagnation, and low or no disinfectant residual.

Analysis of the Building Water Systems

Utilizing your process flow diagram (PFD) in conjunction with the building water system inventory, conduct a comprehensive assessment to identify potentially hazardous conditions within your building water systems. To address each of the identified hazardous conditions, you will need to determine what control measures (physical, chemical and operational activities such as temperature control, supplemental disinfectant, filtration, flushing, cleaning, and maintenance) will be applied to eliminate, prevent, or minimize the occurrence of growth and spread of Legionella.

Healthcare facilities should include all areas where hazardous conditions may contribute to Legionella growth and spread:

- *Patient care areas (such as patient rooms and ICUs, but don't forget other places like dialysis, respiratory therapy, and hydrotherapy)*
- *Clinical support areas (including dietary and central supply) which could contribute to spread by aspiration*

Consider all potential points where patients can be exposed to contaminated water, including critical areas like ice machines, heater-cooler units, and respiratory therapy equipment.

Identify specific control locations where physical, mechanical, operational, or chemical control measures can be applied. For each control measure, establish precise control limits for which the control measure must be maintained. Control limits define the acceptable range of physical or chemical parameters that must be consistently maintained to prevent hazardous conditions. Control measures must be routinely monitored to ensure they are within the established control limits. Develop a monitoring schedule for each control location. Corrective actions should be developed, which can be implemented when control measures exceed their established control limits. These actions should be designed to promptly address deviations and restore compliance with the WMP. By implementing and adhering to this structured approach, facilities can effectively manage and mitigate risks associated with potential exposure to contaminated water.

Examples of control measures are provided in the section, "[Control Measures for Potable Water Systems](#)" and examples of corrective actions are provided in the section, "[Corrective Action Procedures](#)."



Disclaimer: Examples of control measures are not meant to be exhaustive or applicable to every facility. These examples are not meant to supersede manufacturer instructions or local codes/regulations. You must adhere to manufacturer instructions for the operation and maintenance of devices and water system components in your facility. **Replace examples within the table with manufacturer specifications, or as specified by local regulations and codes.**

Example of Control Measures for Potable Water Systems

Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations (See next section)
				Means and Methods	Frequency		
Incoming Water Main	Disinfectant residual (monitoring)	≥ 0.5 ppm free chlorine	Regularly monitoring disinfectant residual levels of the incoming water supply is an important step to ensure the quality of the water. Water with low or no disinfectant residual can increase the risk of <i>Legionella</i> growth. Knowing these values will aid in determining whether or not to install a supplemental disinfection system.	-Use a calibrated colorimeter to measure incoming free chlorine	Weekly monitoring of incoming free chlorine	Engineering Staff (Name)	[Insert Procedure Number]
Backflow Preventer	Maintenance	Cleaning of backflow preventer per manufacturer's instructions.	The function of a backflow preventer is to prevent the backflow of water from one system to another. Device failure may allow contaminated water to backflow into potable water.	-Disassemble and thoroughly clean all serviceable parts -Test unit after reassembly for proper operation	Annual cleaning of backflow preventer	Mechanical contractor/vendor (Name)	[Insert Procedure Number]
Point of Entry Filter	Maintenance	Cleaning of point of entry filter	Point of entry filters remove particulate matter from the incoming water to improve water quality; however, they can deplete disinfectant levels and harbor growth of <i>Legionella</i> .	-Clean filter housing with a bleach solution then rinse thoroughly -Replace filter cartridge	Biannual (every 6 months) cleaning and replacement of filter cartridge	Mechanical contractor/vendor (Name)	[Insert Procedure Number]
Water Softener	Maintenance	Cleaning of filter housing and	Water softeners are installed to treat hard water by removing minerals; however, they can deplete disinfectant	-Cleaning filter housing with warm soapy water then rinse thoroughly	Biannual (every 6 months) cleaning and replacement of	Mechanical contractor/vendor (Name)	[Insert Procedure Number]

Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations (See next section)
				Means and Methods	Frequency		
		replacement of filter	levels and harbor growth of <i>Legionella</i> .	-Remove visible iron, dirt, or scale -Replace filter	water softener filter		
Plate Type Heat Exchanger	Maintenance	Cleaning of heat exchanger per manufacturer's instructions	Heater exchangers may be installed on potable water systems for energy conservation efforts; however, they can harbor growth of <i>Legionella</i> .	-Recirculate cleaning solution on highest flow setting for no less than 30 minutes then rinse thoroughly with water for no less than 10 minutes - Disassemble heat exchanger and mechanical clean individual plates, valves, and pipes	Annual cleaning of heat exchanger or more frequently as needed based on performance	Mechanical contractor/vendor (Name)	[Insert Procedure Number]
Water Heater	Maintenance	Cleaning of hot water heater per manufacturer's instructions	There are several types of hot water heaters (boiler, instantaneous heater, conventional hot water heater, solar heating, etc.). Water heaters can deplete disinfectant levels and harbor growth of <i>Legionella</i> .	-Clean strainers of debris -Inspect internal surfaces for scale buildup (tubing, plates, coils, etc.)	Annual cleaning and inspection of hot water heater	Mechanical contractor/vendor	[Insert Procedure Number]
Hot Water Storage Tanks	Flushing and maintenance	Flushing and cleaning of hot water tank	Storage tanks provide an opportunity for sediment accumulation, adding to the potential for <i>Legionella</i> growth.	-Open the drain valve and flush water from the bottom until it runs clear to purge sediment buildup -Inspect all components and surfaced for scale buildup; descale as needed	Monthly flushing of the hot water storage tank Quarterly inspection of the hot water storage tank for scale buildup	Mechanical contractor/vendor (Name)	[Insert Procedure Number]

Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations (See next section)
				Means and Methods	Frequency		
Hot Water Storage Tanks	Temperature	≥ 140°F	<i>Legionella</i> can proliferate in hot water systems if sufficient temperatures are not maintained. Hot water tanks can be prone to temperature stratification.	-Collect 300 mL of water from the drain valve at the bottom of the tank and measure temperature with a thermometer probe	Weekly monitoring of water temperature of the hot water storage tank	Engineering Staff (Name)	[Insert Procedure Number]
Thermostatic Mixing Valves	Maintenance & Calibration	Cleaning and inspection of thermostatic mixing valves	Thermostatic mixing valves are used to blend hot and cold water to prevent scalding; however, they can harbor growth of <i>Legionella</i> .	-Clean strainers of debris -Check for leaks to ensure integrity -Test cold water/hot water shut-off operation -Inspect and adjust hot water supply setpoints	Annual cleaning and inspection of thermostatic mixing valves or as needed per manufacturer's instructions	Mechanical contractor/vendor or Engineering Staff (Name)	[Insert Procedure Number]
Hot Water Distribution System	Temperature	> 120°F <i>(Note: Maximum allowable temperature at point of use outlets may require additional controls or adjustment to prevent scalding)</i>	<i>Legionella</i> can proliferate in hot water systems if sufficient hot water temperatures are not maintained.	-Run hot water until it is as hot as it will get and measure temperature with a thermometer probe -Document areas where it takes greater than 60 seconds for water to get hot as this could indicate an issue	Weekly monitoring of hot water temperatures at points of use and return line (as applicable)	Engineering Staff (Name)	[Insert Procedure Number]
Cold Water Distribution System	Temperature	< 77°F <i>(Note: Legionella may grow at temperatures</i>	<i>Legionella</i> can proliferate in cold water systems if sufficient cold water temperatures are not maintained.	-Run cold water until it is as cold as it will get and measure	Weekly monitoring of cold-water temperatures at	Engineering Staff (Name)	[Insert Procedure Number]

Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations (See next section)
				Means and Methods	Frequency		
		as low as 68°F)		temperature with a thermometer probe	points of use outlets		
Hot Water Distribution System	Disinfectant residual	≥ 0.2 ppm free available chlorine	<i>Legionella</i> can proliferate in hot water systems if disinfectant residuals are too low or zero.	Use a calibrated colorimeter to measure free chlorine	Weekly monitoring of cold-water disinfectant residual point of use outlets	Engineering Staff (Name)	[Insert Procedure Number]
Cold Water Distribution System	Disinfectant residual	≥ 0.2 ppm free available chlorine	<i>Legionella</i> can proliferate in cold water systems if disinfectant residuals are too low or zero.	Use a calibrated colorimeter to measure free chlorine	Weekly monitoring of cold-water disinfectant residual point of use outlets	Engineering Staff (Name)	[Insert Procedure Number]
Point of Use Outlets	Flushing	Flushing	Fixtures that are not commonly used or that experience low flow experience increased water age. Increased water age is associated with permissive water temperatures, depletes disinfectant residuals, and buildup of sediment/biofilm.	-Flush cold water using a disinfectant residual level or time-based method (typically flushing durations can range from 10-30 minutes for each fixture but can be longer for large buildings) -Flush hot water until it reaches its maximum temperature at each fixture	Weekly flushing at points of use (healthcare facilities and other buildings with vulnerable populations should flush twice per week)	Engineering Staff (Name)	[Insert Procedure Number]
Point of Use Filters	Maintenance	Replacement	Unmaintained filters can deplete disinfectant residual and harbor growth of <i>Legionella</i> .	-Replace filters - Inspected fixture/outlet housing for leaks and disrepair	Replacement frequency as specified by the original manufacturer	Engineering Staff (Name)	[Insert Procedure Number]

Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations (See next section)
				Means and Methods	Frequency		
Electronic faucets	Cleaning	Cleaning	Electronic faucets are mechanically complex and are more commonly contaminated with <i>Legionella</i> .	-Disassemble, inspect, and clean all components including any inlet screens	Quarterly cleaning of electronic faucets	Engineering Staff (Name)	[Insert Procedure Number]
Aerators, Shower Heads, and Other Attachments	Cleaning and maintenance	Cleaning	Unmaintained devices can deplete disinfectant residual and harbor growth of <i>Legionella</i> .	-Disassemble, inspect, and clean all components including any inlet screens for shower heads, aerators and attachment hoses -Soak or spray showerheads, aerators and hoses attachment with a solution of equal parts of water and distilled vinegar. -Inspect and replace any part or component in disrepair	Monthly cleaning of shower heads, aerators and other attachments.	Engineering Staff (Name)	[Insert Procedure Number]
Dead legs	Flushing	Not to exceed 7 days verified by record review	A dead leg is a section of piping that is no longer, or rarely used. This includes isolated branch lines, pipe sections with closed valves, and pipes with one end capped. Dead legs experience little to no flow and increase risk of <i>Legionella</i> growth.	-Flush weekly -For capped pipes, install a drain valve at the end to facilitate flushing -If possible eliminate all identifiable dead legs permanently	Weekly flushing of dead legs	Engineering Staff (Name)	[Insert Procedure Number]
Side-stream plumbing equipment (e.g., expansion	Flushing and maintenance	Not to exceed 7 days verified	Devices such as expansion tanks and water hammer arrestors	-Attach a hose to the drain valve on the bottom of the	Weekly flushing of the expansion	Engineering Staff (Name)	[Insert Procedure Number]

Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations (See next section)
				Means and Methods	Frequency		
tanks, hammer arrestors, by-pass lines)		by record review	are designed to protect the building water system from excessive pressure or shock; however, often have low flow and promote water stagnation. In addition, the materials inside may promote the formation of biofilm.	expansion tank and thoroughly flush water -Open by-pass valve and let water flow	tank and by-pass valve		
Ice Machines	Cleaning and maintenance	Cleaning and maintenance of ice machines per manufacturer's instructions.	Ice machines have been identified as the source of exposure to <i>Legionella</i> in multiple outbreaks. Ice machines often have carbon filters, which eliminate any disinfectant residual in the water supply. It is common for the compressor to generate heat, resulting in temperatures favorable for <i>Legionella</i> growth in the water lines.	-Thoroughly clean components with water and detergent and replace feeder lines as needed -Sanitize machine by circulating 50-100ppm solution of sodium hypochlorite for 2-4 hours then thoroughly flush with water or sanitize methods as specified by manufacturer (insert instructions)	Quarterly sanitation of ice machine	Mechanical Contractor/ Vendor (Name)	[Insert Procedure Number]
Hot Water Distribution Continuous Chlorine Supplemental Disinfection System	Disinfectant residual	0.2 – 2 ppm free available chlorine	<i>Legionella</i> can proliferate in hot water systems if disinfectant residuals are too low or zero.	Use a calibrated colorimeter to measure free chlorine	Weekly monitoring at injection point post thermostatic mixing valve	Engineering Staff and/or Water Treatment Vendor (Name)	[Insert Procedure Number]
Main Cold Water Point of Entry Continuous Copper Silver Ionization System	Ion Concentration	0.2 – 0.8 ppm Copper 20 to 80 ppb Silver	<i>Legionella</i> can proliferate in cold and hot water systems if ions concentration is below the control limits.	Inductive coupled plasma mass spectrometry (ICP) laboratory analysis sampling	Monthly monitoring at point of use outlets	Engineering Staff and/or Water Treatment Vendor (Name)	[Insert Procedure Number]

Example of Corrective Action Procedures

Corrective Action Procedure Number	Control Location	Control Measure Outside of the Established Control Limit	Corrective Action Procedures
[Insert Procedure Number]	Hot water storage tank	Stored hot water out of appropriate temperature range	<ol style="list-style-type: none"> 1. Ensure that the hot water system is functioning properly, including heating mechanism and recirculation pumps. 2. Contact a licensed plumber to inspect the device and perform preventive maintenance if needed. 3. Evaluate the hot water temperature setting and adjust if necessary. 4. Repeat the temperature reading of water from the drain valve at the bottom of the tank in 24 hours to confirm effectiveness. 5. Record all actions taken and submit a report to the Program Team.
[Insert Procedure Number]	Hot water distal outlet	Hot water out of appropriate temperature range	<ol style="list-style-type: none"> 1. Inspect the outlet for any signs of a localized issue. <ol style="list-style-type: none"> a. Low water pressure or flow rate b. Leaking fixture or faulty mixing valve c. Possible cross-connections near by 2. Collect temperatures at adjacent areas (upstream and downstream) to determine the extent of the issue. 3. Evaluate and adjust mixing valve set points if present. 4. Evaluate the hot water heater temperature setting and adjust if necessary. 5. Inspect or install pipe insulation if needed. 6. Repeat temperature reading of water at the outlet in 24 hours to confirm effectiveness. 7. Record all actions taken and submit a report to the Program Team. 8. Evaluate findings with the Program Team and develop a mitigation plan if appropriate hot water temperatures cannot be maintained.
			Insert additional rows for your building that correspond to the Water Management Program's control limit violation

Confirmatory Procedures

Verification Procedures

You must establish procedures to confirm both, initially and on a continuous basis that you are implementing the Program as designed. For example, if you said you were going to flush water at infrequently used water outlets on a weekly basis, have you been doing that? It is important to document all Program activities including flushing, cleaning, maintenance, inspections, water quality monitoring, and corrective actions and to review this operational documentation regularly. This is referred to as verification.

Consider conducting routine Water Management Program Team meetings at least quarterly. The meetings can be used to review, at a minimum, any results from water testing for Legionella, whether any control measures were not within specific limits and why that may have occurred, and whether any corrective actions were taken. These discussions can be facilitated by visual representation (e.g., graphing) of validation data.

Validation Procedures

In addition to your verification procedures, you must establish procedures to confirm both, initially and on a continuous basis that the Program implemented as designed is effectively controlling hazardous conditions throughout the building water system. This is the process of reviewing your control measures and ensuring they are meeting their specified control limit. For example, are your hot water temperatures at point of use always within your specified target range? This is referred to as validation.

Monitoring logs

Monitoring logs can be used to ensure that the implementation of each control measure is being routinely monitored (verification) and that the control measures are within acceptable ranges (validation). Examples logs are provided on page within this template. You may adapt these logs to include all control measures that are specific to your Water Management Program.

Environmental Sampling for Legionella Testing

*The Centers for Disease Control and Prevention (CDC) states that the best method for validation of a WMP for Legionella is routine testing for Legionella over time. Testing for Legionella can provide critical information to ensure a WMP is operating as intended and Legionella is well-controlled. **Because of the vulnerable population served, inpatient healthcare facilities should conduct routine testing for Legionella to validate their WMP.** Other facilities, such as those listed below, should consider conducting routine testing as a best practice.*

- *Serve individuals at an increased risk for Legionnaires' disease.*
- *Have a history of associated Legionnaires' disease cases.*
- *Have difficulty maintaining the control measures within specified control limits.*

Refer to [CDC's Routine Testing for Legionella Toolkit](#) for guidance regarding sample collection, test methods, laboratory considerations, and test results for WMP performance.

Potable Water Quality Monitoring Log

Location	Date/Time	Water Quality Parameters [insert additional parameters as needed]					Comments <i>(As applicable, specify any observation or anomalous conditions for each location such as disinfectant residual outside the limit, WMP team notified)</i>	Monitoring Performed By <i>(Staff Name)</i>
		Water Type <i>(hot or cold)</i>	Maximum (hot) or Minimum (cold) Temperature <i>(°F)</i>	Time to Reach Max/Min Temp <i>(seconds)</i>	Disinfectant Residual (mg/L or ppm) <i>(post-flush)</i>	pH <i>(post-flush)</i>		
Incoming cold water								
Hot water tank								
Water Heater #1								
Before mixing valve								
After mixing valve								
Hot water return line								
Resident room #101 – bathroom sink								
Janitor utility sink – 4 th floor								
[Insert additional rows for your building to include proximal and distal points based on riser diagram]								

Potable Water Flushing Log

Location	Fixture <i>(sink, shower or toilet, tank, water heater)</i>	Date	Time	Flushing Duration <i>(minutes)</i>		Comments <i>(As applicable, specify any observation or anomalous conditions for each location flushed such as low water pressure, water discoloration, fixture broken, and if the WMP team is notified for repairs)</i>	Flushing Performed By <i>(Staff name)</i>
				Hot Water	Cold Water		
Incoming cold water							
Hot water storage tank							
Water Heater #1							
Before mixing valve							
After mixing valve							
Hot water return line							
Resident room #101 – bathroom sink							
Janitor utility sink – 4 th floor							
[Insert additional rows for your building to include proximal and distal points based on riser diagram]							

Maintenance Log

Equipment, Device or Component Name	Location	Date of Maintenance	Maintenance Description	Maintenance Performed By <i>(Staff name)</i>	Next Maintenance Due On	Comments <i>(As applicable, list or describe any relevant findings or anomalous conditions noted during the activity)</i>
Cooling tower	10 th floor roof	1/1/24	Cleaned and drained basin, power washed fill and inlet louvers, replaced damaged/clogged nozzles, checked drift eliminators	Staff engineer, John/Jane Smith	4/1/24	Adjusted water makeup and blow down valves
Water Heater	Ground floor MER	1/1/24	Drained, flushed, and refilled the water heater; checked all connections including pressure relief valves for leakage	Staff engineer, John/Jane Smith	1/1/25	Replaced pressure relief valve due to excessive leaking

Contingency Response Plans

It is important to have written procedures in place for scheduled and unanticipated changes to both potable and non-potable water systems (e.g., scheduled maintenance, construction, renovation, water supply interruptions, and failure of system water components such as heating, chemical treatment, backflow prevention, etc.) that may impact water quality. The contingency response should include the following procedures and actions:

- a. Detailed steps to take to address the event and to monitor water quality during and after the event.*
- b. Additional response actions as determined by the team to prevent exposure to contaminated water.*

Case(s) of Legionnaires' Disease

A contingency response plan is always required when a case of Legionnaires' disease possibly associated with your building has been identified. In your written procedures, be sure to include actions such as notifying your [local health department](#), reassessing your Water Management Program control measures, and implementing immediate controls if building occupants are at increased risk for Legionnaires' disease. Healthcare facilities should ensure healthcare providers are aware when there is a case of Legionnaires' disease associated with their facility so they can test patients with healthcare-associated pneumonia for Legionella infection.

Legionella Detections in the Building Water System

A contingency response plan is always required when a WMP is unable to control Legionella growth in a building water system. In some instances, an emergency remediation of the building water system may be warranted. Be sure to include written procedures for performing emergency remediation(s) including which key personnel will be involved, which remediation strategies will be utilized, how to communicate risk to building occupants, and how to assess the efficacy of remedial actions.

Notification and Communication

Establish notification and communication procedures for implementation of all WMP activities including corrective actions for control measures outside the established limits. Identify the team members responsible for communicating, coordinating required response action, and required response time for any anomalous condition observed in the building water systems.

Documentation and Record Keeping

The WMP must include documentation and record keeping procedures. Identify key WMP team members responsible for maintaining records such as revisions to WMP, monitoring and maintenance logs, compliance activities, corrective actions, communications, emergency remediation records, and other operation records specific to your WMP. Identify a centralized location where records shall be kept and consider including web links for accessing operational manuals and records that are available electronically online. Implement at minimum an annual review of WMP or more frequently based on

changes to building water system(s), team members, adjustments to verification and validation procedures or other key elements of the WMP.

Appendix

A. Additional Considerations for Healthcare Facilities

The general principles of *Legionella* water management programs also apply to healthcare facilities. However, there are some additional considerations that healthcare facility staff should be aware of when it comes to these programs. A comprehensive Water Management Program can have additional benefits in the control of other water-related healthcare-associated infections. Water Management Programs should therefore be monitored for their efficacy in reducing risk for a variety of pathogens. These pathogens include gram-negative bacteria (e.g., *Pseudomonas*, *Burkholderia*, *Stenotrophomonas*) and nontuberculous mycobacteria.

As part of a Water Management Program, healthcare facilities can conduct a Water Infection Control Risk Assessment (WICRA) to assess water sources, mode of transmission, patient susceptibility, patient exposure, and program preparedness.

Under rare circumstances, certain *Legionella*-specific interventions may provide an environment in which these other pathogens can increase in number. For example, researchers have documented increased colonization by nontuberculous mycobacteria in building water systems following the introduction of monochloramine, an agent effective for reducing *Legionella* colonization of biofilm. In general, you can use the same principles of water management to reduce the risk of disease from these other pathogens in building water systems. A consultant with *Legionella*-specific healthcare environmental expertise may sometimes be able to provide information about specific interventions, taking other pathogens into consideration.

In June 2017, the Centers for Medicare & Medicaid Services (CMS) released a [survey and certification memo](#) stating that healthcare facilities should develop and adhere to ASHRAE-compliant water management programs. These water management programs help reduce the risk for *Legionella* and other pathogens in their water systems. The following resources may be useful for understanding the requirement.

- Healthcare water management program [frequently asked questions](#)
- CMS surveyor training [video](#)

B. Hot Tubs

Hot tubs require a device-specific Water Management Program (WMP), which can be incorporated into the building water system’s WMP or can be a standalone document. If you operate a hot tub, please ensure the following supplemental tables are included in your WMP.

Hot Tub Inventory	Hot Tub #1	Hot Tub #2
Hot tub location/description: (e.g., main, private room #)		
Dates of operation:		
Indoor or outdoor:		
Installation date:		
Max. bather load:		
Size in gallons:		
Filter type: S = sand DE = diatomaceous earth C = cartridge		
Compensation tank present? (yes/no)		
Type of disinfectant used: (Chemical name, formulation, and amount used)		
Method used for adding disinfectant: (e.g., automatic feeder, by hand)		
Method used for monitoring and maintaining disinfectant and pH levels: (e.g., automatic controllers)		

Example of Control Measures for Hot Tubs							
Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations
				Means and Methods	Frequency		
Hot tub water	Chlorine (disinfectant monitoring)	2-10 ppm free chlorine	<i>Legionella</i> can proliferate in water systems if disinfectant residuals are too low.	Color comparator designed for pool testing	Every 2 hours	Maintenance Staff	Close the hot tub and adjust the chemicals to maintain acceptable disinfection levels.
Hot tub water	Bromine (disinfectant monitoring)	2-10 ppm bromine	<i>Legionella</i> can proliferate in water systems if disinfectant residuals are too low.	Color comparator designed for pool testing	Every 2 hours	Maintenance Staff	Close the hot tub and adjust the chemicals to maintain acceptable disinfection levels.
Hot tub water	pH (monitoring)	7.2-7.8 pH	High pH can increase scale formation and reduce disinfectant efficiency.	Color comparator designed for pool testing	Every 2 hours	Maintenance Staff	Close the hot tub and adjust the chemicals to maintain an acceptable pH level. [Insert Procedure Number]
Hot tub water	Heterotrophic plate count (monitoring)	<200 CFU/mL	Counts consistently >200 CFU/mL indicate a general decrease in water quality	HPC shall be performed in accordance with DSAM procedures approved by the NJDEP	Once a week	Certified Laboratory	Notify the health authority and immediately close, drain, disinfect, refill, and resample the hot tub water. Reopen at the discretion of the health authority.

Example of Control Measures for Hot Tubs							
Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations
				Means and Methods	Frequency		
Filter Media	Maintenance	Per Manufacturer specifications	Proper filtration is needed to remove contaminants that promote the growth of bacteria and algae. Additionally, unmaintained filters can deplete disinfectant residual and harbor growth of <i>Legionella</i>	Check maintenance logs to ensure filters are maintained per manufacturer's instructions. Proper maintenance varies by filter type (e.g., sand filtration, cartridge filtration, diatomaceous earth)..	Review logs weekly	Maintenance Staff	Immediately back wash, clean, or replace filter media per manufacturer's instructions.
Circulation pump	Water circulation (inspection)	Turnover every 30 minutes	Extended periods of non-circulated water can lead to stagnation and decreased water quality.	Calculate the turnover rate= pool volume / flow rate/ (60 min/hour)	Calculate the turnover rate weekly	Maintenance Staff	Notify the CPO to determine the reason(s) for inadequate circulation.
Hot tub water	Water replacement	Water replacement frequency in days = (Spa volume in gallons/3)/average # users per day.	Water age can increase the amount of organic matter in the water, therefore inhibiting the disinfectant and acting as nutrients for bacteria and algae.	Review maintenance logs	Review maintenance logs weekly	Maintenance Staff	Drain the water, clean and disinfect the hot tub, and refill the tub.

Example of Control Measures for Hot Tubs							
Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations
				Means and Methods	Frequency		
Hot tub surfaces	Cleaning	Scrub all hot tub surfaces every time the hot tub is drained to replace the water	A buildup of sediment and biofilm can and promote <i>Legionella</i> growth	Review maintenance logs	Review maintenance logs weekly	Maintenance Staff	Drain, scrub, clean, and refill the hot tub.
Hot tub water	Biocidal shock treatment	Treat the hot tub with a biocidal shock treatment every night after service,	A hot tubs bathing load can introduce a variety of contaminants into the water, such as body oils, bacteria, and other organic materials.	Review maintenance logs	Review maintenance logs daily	Maintenance Staff	Remove from service to carry out disinfection with a higher than normal disinfectant residual. For example, a free residual of 10 mg/L or 10 times the combined chlorine level, whichever is greater, for at least one to four hours is commonly used.

C. Cooling Tower Systems

Cooling tower systems require a device-specific Water Management Program (WMP), which can be incorporated into the building water system's WMP or can be a standalone document. If you operate a cooling tower system, please ensure the following supplemental tables are included in your WMP.

Cooling Tower System Specification	Cooling Tower System #1	Cooling Tower System #2	Cooling Tower System #3	Cooling Tower System #4
Purpose (e.g., air conditioning, refrigeration industrial processes)				
Number of Cooling Tower Equipment (CTE) or Cells				
CTE Siting (indoor, outdoor)				
Physical Location of CTE (roof floor#, setback floor#)				
Installation Date (MM/DD/YY)				
Operation (e.g., seasonal, all-year round, on-demand)				
Manufacturer of CTE (e.g., Marley SPX, Evapco, BAC, Delta, etc.)				
Total Nominal Tonnage (tons)				
Total Water Volume (gallons)				
CTE Type (e.g., open circuit cooling tower, closed circuit fluid cooler or evaporative condenser)				
Equalizer Line? (Yes/No)				
Are Drift Eliminators Used? (Yes/No)				
Internal Cooling Components (e.g., chillers, heat exchangers, package units, or heat pumps)				
Water Treatment (e.g., manual or automated)				
Name of Oxidizing Biocide(s)				
Name of Non-Oxidizing Biocide(s)				
<p>Note: Cooling towers with multiple cells or equipment that have a common shared open-loop condenser water is considered a single system and all components including chillers, heat exchangers, package units, heat pumps, condensers etc., are considered part of the entire cooling tower system.</p>				

Example of Control Measures for Cooling Tower Systems							
Control Measure	Control Location	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations
				Means and Methods	Frequency		
Free available chlorine	Treatment sampling port or basin	>0.5 ppm	<i>Legionella</i> can proliferate in recirculated water if disinfectant residuals are too low or zero.	Chlorine probe	3 times a week	Engineering staff	Notify WMP team, increase biocide dosing, reassess water treatment schedule and dosing
Total available chlorine or bromine	Treatment sampling port or basin	>1 ppm	<i>Legionella</i> can proliferate in recirculated water if disinfectant residuals are too low or zero.	Total chlorine or bromine probe	3 times a week	Engineering staff	Notify WMP team, increase biocide dosing, reassess water treatment schedule and dosing
Conductivity	Automated conductivity controller, sampling port or basin	<1200 micromhos/sm	High conductivity can lead to corrosions, scaling or biological fouling due to excess concentration of impurities in the recirculated water	Automated controller or manual probe	3 times a week	Engineering staff	Notify WMP team, check bleed or blowdown automated motorized ball or solenoid valve for malfunction or increase manual bleed for non-automated systems, assess rate of bleed based on high peak load and readjust, check incoming fresh water make up controls for malfunction.
pH	Automated pH controller, treatment sampling port or basin	7 - 9	High pH can increase scale formation and reduce cooling tower system heat rejection efficiency. Most importantly, scaling provides place for biofilm to grow and minimizes effectiveness of oxidizing biocides.	Automated controller or manual probe	3 times a week	Engineering staff	Notify WMP team, increase bleed rate, reassess water treatment schedule and dosing for scale inhibitors.

Example of Control Measures for Cooling Tower Systems							
Control Measure	Control Location	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations
				Means and Methods	Frequency		
Temperature	Automated controller, sampling port or basin	Operating temperatures specific to cooling tower system design and demand	<i>Legionella</i> can proliferate in cooling tower system within water temperature range 77F to 113F	Automated controller or manual probe	3 times a week	Engineer staff	Notify WMP team, reduce system operating water temperature to the lowest practicable value, review system operation for pumps and fans cycling, adjust setpoints based on consultation with equipment supplier or mechanical service contractor
Routine physical survey	All visible components of the cooling tower system including water treatment station	Components operating per design and specification	Malfunctions of components such as broken or misaligned fill or drift eliminators may allow water splashing, excess drift loss, and/or biofilm growth, low or now chemical or biocide reserves or leaks can allow system operating without adequate biological controls.	Physical inspection based of a component review checklist	Weekly	Engineering staff	Notify WMP team immediately to correct any malfunctioning component of the cooling tower system.
Routine flushing	Equalizer piping	Interval not to exceed 5 days, verified by records review	Equalizer line may have low, or no-flow locations commonly known as dead legs. Presence of dead legs provide ideal condition for <i>Legionella</i> growth due to insufficient disinfectant and accumulation of biofilm.	Opening equalizer drain line for 5 minutes	Every 5 days	Engineering staff	If flushing interval exceed 5 days, increase biocide to minimize risk of <i>Legionella</i> growth.

D. Decorative Fountains

Decorative fountains require a device-specific Water Management Program (WMP), which can be incorporated into the building water system's WMP or can be a standalone document.

Water Feature Questions	Feature #1	Feature #2
Describe type of fountain (e.g., water wall, cabana misters)		
Describe location of decorative fountain, including if it's indoors or outdoor		
Source(s) of make-up water		
Capacity in gallons		
Does the device utilize spray nozzles? (yes/no) If yes, describe		
Is the device equipped with a filter? (yes/no) If yes, model and manufacturer		
Is there the presence of a heat source (e.g., submerged incandescent lighting, direct sunlight) (yes/no) If yes, describe		
Does the device operate continuously or intermittently? If intermittently, describe schedule		
Describe how chemicals are added to the fountain (e.g., automatic water treatment system, manual dosing)		
Describe type of disinfectant used, including chemical name, formulation, and amount used		
Operating as designed and in good repair? If no, describe issues		

Example of Control Measures for Decorative Fountains

Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations (See next section)
				Means and Methods	Frequency		
Automated controller or basin	Disinfectant residual (monitoring)	If manual dosing: 3-4 mg/L free chlorine residual for at least 1 hour/day If > 25 gallons: 0.5 mg/L free chlorine residual for at least 6 hours/day If automated dosing: ≥ 0.5 mg/L continuous	<i>Legionella</i> can proliferate in water systems if disinfectant residuals are too low.	Use a calibrated colorimeter to measure incoming free chlorine	At least weekly	[Insert Team Member]	[Insert Procedure Number]
Automated controller or basin	pH (monitoring)	<8.5 for chlorine-based biocides <9.0 for bromine-based biocides	As pH increases, the ability of the disinfectant to kill <i>Legionella</i> decreases	Automated controller or manual probe	At least weekly	[Insert Team Member]	[Insert Procedure Number]
Automated controller or basin	Water temperature (monitoring)	<77°F	<i>Legionella</i> can proliferate in cold water systems if sufficient cold water temperatures are not maintained.	Automated controller or manual probe	At least weekly	[Insert Team Member]	[Insert Procedure Number]
Basin	Heterotrophic plate count (monitoring)	<200 CFU/mL	Counts consistently >200 CFU/mL indicate a general decrease in water quality	Collect a 100 mL sample and deliver to a laboratory that performs HPC testing	At least monthly	[Insert Team Member]	[Insert Procedure Number]
All wetted surfaces	Visual inspection	No visible algae or biofilm	Biofilm is a collection of microorganisms that can include <i>Legionella</i>	Physical inspection based of a component review checklist	At least weekly	[Insert Team Member]	[Insert Procedure Number]
Filter	Cleaning and maintenance	Cleaning and maintenance	Unmaintained filters can deplete disinfectant residual and harbor growth of <i>Legionella</i> .	Backwashing, cleaning, and disinfection per	Monthly	[Insert Team Member]	[Insert Procedure Number]

Control Location	Control Measure	Control Limit	Identified Hazardous Condition and Risk Assessment	Monitoring		Responsible Party or Team Member	Corrective Action Procedure for Control Limit Violations (See next section)
				Means and Methods	Frequency		
				manufacturer's instructions			
All wetted surfaces	Cleaning and disinfection	Cleaning and disinfection	Routine cleaning is needed to remove sediment, scale, and biofilm which can promote <i>Legionella</i> growth	Draining, cleaning, and disinfecting per manufacturer's instructions	Monthly when 5-25 gals or weekly when <5 gals	[Insert Team Member]	[Insert Procedure Number]

E. Information and Resources

Standard

- American Society of Heating, Refrigerating and Air-Conditioning Engineers. [ANSI/ASHRAE Standard 188, Legionellosis: Risk Management for Building Water Systems](#).

General Guidelines

- American Society of Heating, Refrigerating and Air-Conditioning Engineers. [Guideline 12, Minimizing the Risk of Legionellosis Associated with Building Water Systems](#).
- American Water Works Association. [Responding to Water Stagnation in Buildings with Reduced or No Water Use: A Framework for Building Managers](#).
- Cooling Technology Institute, 2020. [Guideline \(GDL\) 159 – Practices to Reduce the Risk of Legionellosis from Evaporative Heat Rejection Equipment Systems](#).
- Centers for Disease Control and Prevention. [Model aquatic health code](#).
- Centers for Disease Control and Prevention. [Developing a Water Management Program to Reduce Legionella Growth and Spread in Buildings: A Practical Guide to Implementing Industry Standards](#).
- Centers for Disease Control and Prevention. [Controlling Legionella in Hot Tubs](#).
- Centers for Disease Control and Prevention. [Toolkit for Controlling Legionella in Common Sources of Exposure \(Legionella Control Toolkit\)](#).
- Council of State and Territorial Epidemiologists. [Water Management Program Template](#).
- Environmental Protection Agency. [Technologies for Legionella Control in Premise Plumbing Systems: Scientific Literature Review](#).
- American Industrial Hygiene Association: [Recognition, Evaluation, and Control of Legionella in Building Water Systems](#).
- National Academies of Sciences, Engineering, and Medicine (NASEM). [Management of Legionella in Water Systems](#).

Healthcare-Specific Guidelines and Requirements

- Department of Veterans Affairs. [Prevention of healthcare-associated Legionella disease and scald injury from water systems](#).
- Centers for Medicare & Medicaid Services. [Requirement to reduce Legionella risk in healthcare facility water systems to prevent cases and outbreaks of Legionnaires' disease](#).

- Centers for Disease Control and Prevention. [Guidelines for environmental infection control in health-care facilities: Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee.](#)