Centers for Disease Control and Prevention

Legionella Environmental Assessment Form

HOW TO USE THIS FORM

This form enables public health officials to gain a thorough understanding of a facility's water systems and aerosolizing devices and assists facility management with minimizing the risk of Legionnaires' disease. It can be used along with epidemiologic information to determine whether to conduct *Legionella* environmental sampling and to develop a sampling plan. In addition, findings from this environmental assessment can be used to develop a water management program (WMP) by identifying areas at risk for *Legionella* growth and spread. The assessment should be performed on site by an epidemiologist or environmental health specialist with knowledge of the ecology of *Legionella*, building water systems, and water treatment; this includes public health professionals familiar with CDC resources such as the *Legionella* Environmental Assessment Form Marking Guide, Toolkit for Controlling *Legionella* in Common Sources of Exposure, and PreventLD.The LEAF Marking Guide walks the user through this form by providing instructions and additional considerations for the questions by adding further context and discussing relevant risk factors for *Legionella* growth and spread that users may find helpful.

Complete the form in as much detail as possible.

- The content in the "Facility Characteristics" and "Water Supply Source" sections will be applicable to every assessment.
- Do not leave questions blank; if a question does not apply, write "N/A." If a question applies but cannot be answered, explain why.
- Where applicable, specify the units of measurement being used (*e.g.*, ppm).
- Take pictures and attach them to the form to visually support the written findings. Pictures should be taken of any significant findings in implicated mechanical components and water treatment systems.
- It may take several hours to complete the form.

Complete the **device-specific appendices** that pertain to the facility being assessed after completing the relevant portions of the main form.

Keep the following **key factors** that contribute to *Legionella* growth in mind as you complete the form:

Sediment and Biofilm – Mineral buildup in a system supports *Legionella* growth and consumes disinfectant residual. Microorganisms and the slime they secrete make up biofilms that stick to and grow on any continually moist surface. Biofilms provide a stable growth surface and an environment with nutrients for many types of germs, including *Legionella*.

Temperature – *Legionella* generally grow well between 77°F and 113°F. The optimal growth range for *Legionella* is between 85°F and 108°F. Growth slows between 113°F and 120°F, and *Legionella* begin to die above 120°F. Growth also slows between 68°F and 77°F, and *Legionella* become dormant below 68°F.

Water Age – Slowly moving or stagnant water increases water age, which provides opportunities for *Legionella* growth. Higher water age also contributes to disinfectant residual loss and favorable temperatures for growth.

Disinfectant Residual – Disinfectant residuals are the amount of chemical disinfectant available in the water to inhibit *Legionella* growth. Disinfectant residual decreases as water age and temperature increase.

Refer to CDC's *Legionella* Control Toolkit for detailed guidance on evaluating the key factors for *Legionella* growth in specific water systems and devices. For additional training and information, please see CDC's resources for health departments.

SAFETY PRECAUTIONS

If the epidemiologic information available suggests a device is a potential source (*e.g.*, hot tub, cooling tower), request that the facility management turn it off (but do not drain or disinfect) to stop transmission. Persons at increased risk of developing Legionnaires' disease if exposed to *Legionella* (*e.g.*, immunocompromised individuals) should not accompany the sampling team.

Optional Personal Protective Equipment (PPE)

Gloves are useful for sampling hot tub filters or other sites that may be heavily contaminated with organic material.

Wearing a half-face air-purifying respirator equipped with an N95 filter may be appropriate in the following situations: a. when sampling cooling towers if the fans cannot be turned off, or b. in enclosed spaces with an aerosol-generating device that cannot be turned off. Respirators must be used in accordance with a comprehensive respiratory protection program, which includes fit testing, training, and medical clearance ahead of their use (see OSHA standard 29 CFR 1910.134). For more information about N95 respirators, visit the National Institute for Occupational Safety and Health (NIOSH) website.

BEFORE ARRIVING ON SITE

- Request the attendance of the lead facility manager as well as others who have a detailed knowledge of the facility's water systems, such as a facility engineer or industrial hygienist.
- Request that they have maintenance logs and facility construction as-built diagrams available for the meeting.
- Bring a plastic 500ml or 1L bottle for water parameter sampling, thermometer, pH test kit, and a colorimeter that can detect a wide range of residual disinfectant (<1 ppm for potable water and up to 10 ppm for hot tub water).

LEGIONELLA ENVIRONMENTAL ASSESSMENT FORM

Person(s) completing the assessment:

Name: _____ Job Title: _____

Organization: _____

Telephone: _____ E-mail: _____

Name: _____ Job Title: _____

Organization: _____

Telephone: _____ E-mail: _____

Assessment details:

Facility Name: _____

Date of Assessment: _____

Facility Address:

Street: _____ City: _____

State: _____ Zip: _____

Person(s) interviewed during the assessment:

Name: _____ Job Title: _____

Organization: _____

Telephone: _____ E-mail: _____

Name: _____ Job Title: _____

Organization: _____

Telephone: _____ E-mail: _____

Name: _____ Job Title: _____

Organization: _____

Telephone: _____ E-mail: _____

Facility Characteristics

1. Is this a healthcare facility or facility with skilled nursing care (*e.g.*, hospital, long term care/rehab/skilled nursing facility, clinic), or an assisted or senior living facility?

   ○ YES ***(If YES, skip to Question 2 and also complete Appendix A.)***

   ○ NO

   If NO, indicate type of facility (check all that apply):

   ☐ Other residential building (*e.g.*, apartment, condominium)

   ☐ Hotel, motel, or resort

   ☐ Vacation rental property (e.g., Airbnb, VRBO, Vacasa)

   ☐ Recreational facility (*e.g.*, health club, water park)

   ☐ Office building

   ☐ Manufacturing facility

   ☐ Restaurant

   ☐ Other: _____

2. Total number of buildings on the premises:_____ Total number of buildings being assessed: _____

3. Total number of rooms that can be occupied overnight (*e.g.*, patient rooms, hotel rooms): _____

4. Does occupancy vary throughout the year?
   - ○ YES
   - ○ NO

   If YES, seasons with lowest occupancy (check all that apply):
   - ☐ Winter
   - ☐ Spring
   - ☐ Summer
   - ☐ Fall

5. Are any occupant rooms taken out of service (*e.g.*, annually for low season, routinely for inventory, permanently for reuse as storage or administrative purposes)?
   - ○ YES
   - ○ NO

   If YES, which rooms?_____

6. Did the facility recently experience (*i.e.*, last 12 months) a period of prolonged, reduced occupancy, or a building closure?
   - ○ YES
   - ○ NO

   If YES, which rooms/buildings? _____

7. Describe any interventions taken as a result of building occupancy changes or occupant rooms taken out of service (*e.g.*, flushing, hyperchlorination):

   _____

8. Average length of stay for occupants (check one):
   - ○ 1 night
   - ○ 2–3 nights
   - ○ 4–7 nights
   - ○ >7 nights

9. Does the facility have emergency water systems (*e.g.*, fire sprinklers, safety showers, eye wash stations)?
   - ○ YES
   - ○ NO

   If YES, are these systems regularly tested (*i.e.*, sprinkler head flow tests)?
   - ○ YES
   - ○ NO

   If YES, how often and when was the last test? _____

10. Are there any cooling towers or evaporative condensers on the facility premises?
    - ○ YES ***(If YES, also complete Appendix B.)***
    - ○ NO

11. Are there any hot tubs, whirlpool spas, or hydrotherapy spas on the facility premises?
    - ○ YES ***(If YES, also complete Appendix C.)***
    - ○ NO

12. Are there any decorative fountains, misters, water features, etc. on the facility premises?
    - ◯ YES ***(If YES, also complete Appendix D.)***
    - ◯ NO

13. Does the facility have centralized humidification (*e.g.*, on air-handling units) or any room humidifiers?
    - ◯ YES
    - ◯ NO

    If YES, describe their location and operation:

14. Does the facility have ice machines?
    - ◯ YES
    - ◯ NO

    If YES, list manufacturer and model or catalog number:_____

15. Does the facility have a landscape irrigation or sprinkler system?
    - ◯ YES
    - ◯ NO

    If YES, describe their location and operation:

16. Has there been any recent (last 6–12 months) or ongoing major construction on or around the facility premises?
    - ◯ YES ***(If YES, also complete Appendix E.)***
    - ◯ NO

17. Has this facility been associated with a previous legionellosis cluster or outbreak?
    - ◯ YES
    - ◯ NO

    If YES, please describe number of cases, dates, potential sources (if identified), and any interventions (immediate and long-term) to prevent recurrence:

18. Does the facility have a water management program (WMP)?
    - ◯ YES
    - ◯ NO

    If YES, does the facility ever test for *Legionella* in water samples?
    - ◯ YES ***(If YES, obtain copies of results or summaries going back at least one year)***
    - ◯ NO

    If YES, please describe the program briefly here (does it include clinical disease surveillance and/or environmental *Legionella* surveillance?) and **obtain a written copy** of the program policy:

19. Describe each building that shares water systems (or air systems with centralized humidification), including the main facility.

Building Name (List main facility building first)	**Original Construction** Year completed	**Later Construction** (renovation, expansion) From/To or "N/A"	**Stories or Levels** #	**Occupancy Rate** (%)* Rate (%) or "N/A"	**Daily Census** (yr. avg.) #/day or "N/A"	**Use** (List all types of uses) *e.g.*, occupant rooms, utilities, heating/AC plant For healthcare, specify: Outpatient = O Inpatient (acute) = I Chronic = C Intensive care = ICU Transplant = Tx
1.				High period:_____ Low period: _____		
2.				High period:_____ Low period: _____		
3.				High period:_____ Low period: _____		
4.				High period:_____ Low period: _____		
5.				High period:_____ Low period: _____		

*[occupancy rate = (# of rooms occupied overnight / total # of rooms) X 100]

Comments/notes:

Water Supply Source

20. What is the source of the water used by the facility (check all that apply)?

☐ **Public water system**

If YES, name of supplier: _____

How is the municipal water disinfected (select one)?

○ Chlorine
○ Monochloramine
○ Other: _____

Has treatment of municipal water changed in the past year?

○ YES
○ NO

If YES, specify: _____

☐ **Private well**

If YES, how is the well water disinfected (select one)?

○ Chlorine
○ Other: _____
○ Not disinfected

Is the water filtered on site?

○ YES
○ NO

☐ **Other**: _____

21. Have there been any pressure drops, boil water advisories, or water disruptions (*e.g.*, water main break) impacting the facility in the past 6 months (whether in the public water system before the point-of-entry and/or on facility property)?

○ YES
○ NO

If YES, describe what happened and which buildings or parts of buildings were affected:

22. Does the facility monitor incoming water parameters (*e.g.*, residual disinfectant, temperature, pH)?

○ YES ***(If YES, obtain copies of the logs)***
○ NO

If YES, what is the range of disinfectant residual, temperature, and pH entering the facility on the day of the assessment?

Premise Plumbing System

Note: It is important to gain an understanding of where and how water flows, starting where it enters the facility and including its distribution to and through buildings to the points of use. Understand water processes, including but not limited to: heating, storage, filtration, UV irradiation, and addition of supplemental disinfectants. Refer to a facility map and blueprints, obtain copies of these and/or draw a diagram, and include with the completed assessment. For additional recommendations specific to potable water systems, see: https://www.cdc.gov/legionella/wmp/control-toolkit/potable-water-systems.html.

23. Are cisterns and/or water storage holding tanks used to store potable water before it's heated?
    - ◯ YES
    - ◯ NO

24. Are water softeners used on incoming water?
    - ◯ YES
    - ◯ NO

    If YES, are they installed on the hot, cold, or both water systems: _____

25. Are water filters used?
    - ◯ YES
    - ◯ NO

    If YES, are they installed on the water system centrally (whole system filtration) or at points of use?

    _____

    Filter type (*e.g.*, purpose) and manufacturer/model:

    _____

26. Is there a recirculation system (a system in which water flows continuously through the piping to ensure constant hot water to all endpoints) for the hot water?
    - ◯ YES
    - ◯ NO

    If YES, please describe where it runs and delivery/return temperatures if they are measured:

27. Are thermostatic mixing valves used?
    - ◯ YES
    - ◯ NO

    If YES, describe where they are located:

    Temperature set point(s):

    _____

28. How is the hot water system configured to deliver hot water to each building?

Building Name	Type of System (*e.g.*, instantaneous heater, water heater with a storage tank, solar heating)	Name of System (*e.g.*, Boiler #1, Loop #1)	Areas Served (*e.g.*, floor, rooms)	Date of Installation	Total Capacity (gallons)	Usual Temperature Setting (°F)	Distal Outlet Temperature (°F)
1.							
2.							
3.							
4.							
5.							
6.							
7.							

Comments/notes:

29. What is the maximum **hot** water temperature at the point of delivery permitted by state and local regulations?

_____ °F or _____ °C

30. Are **hot** water temperatures ever measured by the facility at the points of use?

○ YES ***(If YES, obtain copies of the temperature logs)***

If YES, what is the **lowest** documented **hot** water temperature measured at any point within the facility?

_____ °F or _____ °C documented on (mm/dd/yyyy): _____

○ NO

31. Are **cold** water temperatures ever measured by the facility at the points of use?

○ YES (If YES, obtain copies of the temperature logs)

If YES, what is the **highest** documented **cold** water temperature measured at any point within the facility?

_____ °F or _____ °C documented on (mm/dd/yyyy): _____

AND, what is the typical **cold** water temperature measured within the facility in the **summer**?

_____ °F or _____ °C

○ NO

32. Are the potable water disinfectant levels (*e.g.*, chlorine) ever measured by the facility at the points of use?

○ YES ***(If YES, obtain copies of the logs)***

If YES, how often are they measured? _____

If YES, list the range of disinfectant residuals

Summer: _____ Winter: _____

○ NO

33. Does the facility have a supplemental disinfection system for long-term control of *Legionella* or other microorganisms?

○ YES

○ NO

If YES, obtain standard operating procedures (SOPs) for routine use and maintenance as well as maintenance logs and records of disinfection levels, and complete the table:

Buildings With Supplemental Disinfection	**Type of System** (*e.g.*, chlorine, monochloramine, chlorine dioxide, copper-silver)	**Date Installed**	**Serves Hot, Cold, or Both**	**Maintenance Personnel and Contact Information** (in-house or consultant)
			○ Hot ○ Cold ○ Both	
			○ Hot ○ Cold ○ Both	
			○ Hot ○ Cold ○ Both	

Comments/notes:

34. Please describe any maintenance activities (either routine or emergency) carried out on the potable water system in the past year. Obtain records/SOPs if available.

35. Measured Water System Parameters
It is very important to measure and document the current physical and chemical characteristics of the potable water, as this can help determine whether conditions are likely to support *Legionella* growth—think sediment, temperature, water age, and disinfectant residual.

STEP 1: Plan a sampling strategy that incorporates all central water heaters/boilers, storage tanks, and various points along each loop of the potable water system. For example, if the facility has one loop serving all occupant rooms, an occupant room near (proximal) the central hot water heater and another at the farthest point (distal) of the loop should be sampled, at a minimum.

STEP 2: For each sampling point (*e.g.*, tap in an occupant room), turn on the hot water tap and allow the hot water tap to run until it is as hot as it will get. Collect at least 50 ml and measure the temperature. Document the temperature and the time it took to reach the maximum temperature. Measure the disinfectant level and pH. (Note: Measure free chlorine if the disinfectant is chlorine. Measure total chlorine if another disinfectant [*e.g.*, monochloramine] is used.) Repeat for the cold water after letting the tap run for 30 seconds.

Building Name	Name of System (*e.g.*, incoming water, boiler #1, loop #1)	Part of System (Central heater/boiler=C Proximal occupant room=P Distal occupant room=D)	Sampling Site (*e.g.*, heater #1, hot water tap in room #436)	Free Chlorine (ppm)	Monochloramine or Other (ppm)	pH	Hot Temp Max, Cold Temp Min (°F)	Time to Reach Max Temp (min)

Comments/notes:

APPENDIX A. HEALTHCARE, ASSISTED LIVING, AND SENIOR LIVING FACILITIES

Complete for all facilities, including but not limited to hospitals, long-term care/rehab/skilled nursing facilities, assisted or senior living facilities, or clinics.

A1. Type of healthcare facility (check all that apply):

- ☐ Acute care hospital
  - If YES, does the facility have a solid organ or bone marrow transplant program?
  - ○ YES
  - ○ NO
- ☐ Long-term care facility (*i.e.*, nursing home, long term acute care)
- ☐ Rehabilitation facility or other skilled nursing care
- ☐ Assisted living facility
- ☐ Senior living facility
- ☐ Outpatient surgical center
- ☐ Other outpatient clinic (describe): _____
- ☐ Other facility (describe): _____

A2. Number of beds: _____

A3. Are ice machines used to provide ice for patient consumption or processing medical equipment?

- ○ YES
- ○ NO

If YES, list manufacturer and model or catalog number: _____

A4. Do patients or residents at this facility use respiratory therapy equipment (*e.g.*, CPAP, bronchoscopes)?

- ○ YES
- ○ NO

If YES, describe (*e.g.*, source of water used in devices, source of water used to clean devices, and cleaning and drying procedures):

A5. Has this facility experienced previous Legionnaires' disease cases that were "presumptively" or "possibly" facility-associated?
Note: *"Presumptive" healthcare-associated disease is defined as a case in which the person spent greater than or equal to 10 days of continuous stay at a healthcare facility during the 14 days before onset of symptoms. "Possible" healthcare-associated disease is defined as a case in which the person spent a portion of the 14 days before date of symptom onset in one or more healthcare facilities, but does not meet the criteria for presumptive healthcare-associated Legionnaires' disease.*

- ○ YES
- ○ NO

If YES, describe (*e.g.*, number of cases, dates):

APPENDIX B. COOLING TOWERS AND EVAPORATIVE CONDENSERS

This form enables public health officials to gain a thorough understanding of cooling towers/evaporative condensers and how to minimize the risk of Legionnaires' disease through good water management practices. It can be used along with epidemiologic information to determine if a water management program needs to be modified. Information produced using this form may also be used to determine the need for increased or modified environmental sampling, including *Legionella* sampling. The assessment should be performed on site by a person with knowledge of cooling tower mechanics, water treatment, and *Legionella* ecology such as the cooling tower content in the *Legionella* Control Toolkit and the LEAF Marking Guide.

Complete the form in as much detail as possible. Do not leave sections blank; if a question does not apply, write "N/A." If a question applies but cannot be answered, explain why. Where applicable, specify the units of measurement being used (*e.g.*, ppm). Remember to take pictures and attach them to the report to visually support the written findings.

BEFORE ARRIVING ON SITE

- Review CDC's *Legionella* Environmental Assessment Form Marking Guide.
- Review CDC's *Legionella* Control Toolkit: Controlling *Legionella* in Cooling Towers.
- Request the attendance of the lead facility manager as well as others who have a detailed knowledge of the facility's cooling towers. Cooling towers are commonly maintained by an outside contractor, and they may need to be contacted if facility management does not have an in-depth knowledge of these systems.
- Bring a plastic bottle, thermometer, pH test kit, chlorine test kit, and necessary safety items.
- Request copies of maintenance logs, chemical test results, and sampling results for the previous 12-month period.

Please fill out the following information for each individual tower associated with an investigation. List all cooling towers and evaporative condensers on the facility premises:

Cooling Tower ID (*e.g.*, CT1)	**Operational** (Y/N)	**Manufacturer**	**Date of Installation**	**Location of Device**	**Number of Cells**	**Drift Eliminators Used?** (Y/N)	**Purpose of Towers** (*e.g.*, heating/cooling, industrial process)
	◯ Yes ◯ No					◯ Yes ◯ No	
	◯ Yes ◯ No					◯ Yes ◯ No	
	◯ Yes ◯ No					◯ Yes ◯ No	
	◯ Yes ◯ No					◯ Yes ◯ No	
	◯ Yes ◯ No					◯ Yes ◯ No	

Comments/notes:

General Cooling Tower Disinfection, Operation and Maintenance Characteristics

B1. Disinfectant used in cooling tower(s)?

- ○ YES
- ○ NO

B2. If YES, what type of disinfectant is used?

Oxidizing

- ○ YES
- ○ NO

Non-oxidizing

- ○ YES
- ○ NO

B3. List name(s) of disinfectant used (*e.g.*, chlorine, bromine): _____

B4. Target range in which the disinfectant is regularly maintained: _____

B5. Type of disinfectant dosing system:

Hand fed?

- ○ YES
- ○ NO

Dosing by automated chemical controllers?

- ○ YES
- ○ NO

B6. Schedule of adding disinfectant (*e.g.*, daily, weekly, as needed): _____

B7. Are disinfectant levels monitored?

- ○ YES
- ○ NO

If YES, how often and by whom? _____

Are chemical metering pumps properly maintained and in good condition?

- ○ YES
- ○ NO

B8. Scale and/or corrosion inhibitors used?

- ○ YES
- ○ NO

If YES, what is the schedule for adding scale and corrosion inhibitors (*e.g.*, daily, weekly, as needed):

_____

B9. Type of scale/corrosion inhibitor dosing system:

Hand fed?

- ◯ YES
- ◯ NO

Dosing by automated chemical controllers?

- ◯ YES
- ◯ NO

B10. Is there an adequate supply (at least 30 days) of chemicals on hand?

- ◯ YES
- ◯ NO

B11. Is *Legionella* testing ever performed on the cooling tower?

- ◯ YES
- ◯ NO

If YES, how often and by whom? _____

If YES, describe the testing method, frequency, and responsible party:

_____

If YES, request copies of recent (e.g., 6-12 months) test results.

B12. Is the cooling tower turned off at any time?

- ◯ YES
- ◯ NO

If YES, include schedule: _____

B13. Are there start-up and shut-down procedures for the cooling tower?

- ◯ YES
- ◯ NO

If YES, describe:

Specific Cooling Tower Disinfection, Operation and Maintenance Characteristics

Cooling Tower ID	Current Disinfectant Level	Current Water Temperature	Current Water pH

B14. Were there any recent (last 6 months) special (non-routine) treatments, maintenance or repairs to the cooling tower(s)?

- ○ YES
- ○ NO

Specify tower ID(s), date, and actions taken:

B15. When was an offline cleaning last performed on the cooling tower(s)?

_____

At what frequency are the scheduled cleanings and what do they include?

Visual Inspection of Cooling Towers

B16. Is pitting or other evidence of corrosion visible on internal metal surfaces?

- ○ YES
- ○ NO

Tower ID(s): _____

B17. How much scale, sediment, and debris are visible in the basin and on drift eliminators? Describe in the notes and include pictures in the report:

B18. Is biofilm build-up observed on cooling tower fill?

- ○ YES
- ○ NO

Tower ID(s): _____

Notes: _____

B19. Is poor water clarity observed in cooling tower basin (*e.g.*, green color, extreme foam)?

- ○ YES
- ○ NO

Tower ID(s): _____

Notes: _____

Record Keeping Review

B20. Are records available regarding cooling tower operation and maintenance?

- ○ YES
- ○ NO

Tower ID(s): _____

Notes: _____

APPENDIX C. HOT TUBS, WHIRLPOOL SPAS, AND HYDROTHERAPY SPAS

In many jurisdictions, public hot tubs are permitted and inspected by the local health authority. An environmental health specialist with expertise in pool and hot tub inspection should participate in assessment of hot tubs and will be aware of local regulations and enforcement powers. They should also have access to a pool sampling kit. Request copies of the last inspection report and routine maintenance logs, if applicable. For additional information related to controlling *Legionella* in hot tubs, see the hot tub module of the Legionella Control Toolkit.

C1. Who operates and maintains the hot tub (*e.g.*, name of on-site facilities management, name and affiliation of outside contractor)? Describe their role and frequency of maintenance:

C2. Describe each hot tub and how it is disinfected:

Hot Tub Questions	Hot Tub 1	Hot Tub 2	Hot Tub 3	Hot Tub 4
Hot Tub Descriptor/Location (*e.g.*, main, private room #)				
Indoor or outdoor	◯ Indoor ◯ Outdoor	◯ Indoor ◯ Outdoor	◯ Indoor ◯ Outdoor	◯ Indoor ◯ Outdoor
Max. bather load				
Filter type	◯ sand ◯ diatomaceous earth ◯ cartridge	◯ sand ◯ diatomaceous earth ◯ cartridge	◯ sand ◯ diatomaceous earth ◯ cartridge	◯ sand ◯ diatomaceous earth ◯ cartridge
Date filter was last changed				
Frequency of filter/filter media replacement				
Date of last filter backwash				
Frequency of filter backwash				
Compensation tank present	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No
Type of disinfectant used Include chemical name, formulation, and amount used.				
Current measured disinfectant level (*e.g.*, free chlorine, bromine) (ppm)				
Current measured pH				
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)				
Date last drained and scrubbed				

Hot Tub Questions	Hot Tub 1	Hot Tub 2	Hot Tub 3	Hot Tub 4
Water replacement frequency (*e.g.*, complete drain and refill)				
Was there a recent (*e.g.*, past 2 weeks) disinfectant "shock" treatment? If YES, describe reason and procedures in comments field below. Provide SOP if available	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No
Operating as designed and in good repair If NO, describe issues in comments field below.	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No

Comments/notes:

APPENDIX D. OTHER WATER DEVICES

Complete for decorative fountains, water walls, recreational misters, etc. This can also be modified for industrial-use water. If SOPs and maintenance logs exist, request copies. For additional information related to controlling *Legionella* in other water features, see the modules for decorative fountains and other water devices in the *Legionella* Control Toolkit.

Water Feature Questions	Location #1	Location #2	Location #3	Location #4
Descriptor/Location (*e.g.*, lobby fountain, cabana misters)				
Is the device equipped with a filter? If YES, record type in comments field below.	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No
Indoor or outdoor?	◯ Indoor ◯ Outdoor	◯ Indoor ◯ Outdoor	◯ Indoor ◯ Outdoor	◯ Indoor ◯ Outdoor
Source of water				
Operates continuously or intermittently	◯ Continuously ◯ Intermittently	◯ Continuously ◯ Intermittently	◯ Continuously ◯ Intermittently	◯ Continuously ◯ Intermittently
Presence of a heat source? (*e.g.*, incandescent lighting)				
Current water temperature				
Type of disinfectant used Include chemical name, formulation, and amount used.				
Current measured disinfectant level (*e.g.*, free chlorine, bromine) (ppm)				
Current measured pH				
Is there a maintenance protocol?	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No
Date last cleaned and/or flushed				
Operating as designed and in good repair? If NO, describe issues in comments field below.	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No	◯ Yes ◯ No

Comments/notes:

APPENDIX E. RECENT* OR ONGOING MAJOR CONSTRUCTION

*Previous 6–12 months.

E1. Describe in general the extent of the construction:

E2. Was temporary water service provided to the new construction area (*i.e.*, separate meter)?

- ○ YES
- ○ NO

If YES, describe:

E3. Has jackhammering or pile-driving been used during the construction process?

- ○ YES
- ○ NO

If YES, list dates and locations:

E4. Have there been disruptions or changes to the existing potable water system during the construction?

- ○ YES
- ○ NO

If YES, describe:

E5. Has the potable water changed in terms of taste, odor, or color during the construction process?

- ○ YES
- ○ NO

If YES, describe the changes including when they started and ended:

E6. Is there an SOP for shutting down, isolating, and refilling/flushing for water service areas that have been subjected to repair and/or construction interruptions?

- ○ YES
- ○ NO

If YES, briefly describe the steps used in the SOP (attach a copy if possible):

E7. Was the potable water system flushed before occupying the new building space?

- ○ YES
- ○ NO

If YES, what period of time passed between flushing and when the building was occupied?

Complete table on next page.

E8. Complete the table below:

New Building/Wing Name or Remodeled Area	Date Construction Began	Estimated Date of Completion	Date Water Service Began or Restarted*	Relationship to Existing Potable Water System	Stories and Square Feet Involved (# and sq ft)	Uses (*e.g.*, hotel guest rooms, dining, recreation, utilities) For healthcare: Inpatient = I Outpatient = O Both = B Intensive Care = ICU Transplant = Tx	Date Occupants Began Occupying New or Remodeled Building	Floors Currently Occupied
				◯ Independent ◯ Extension				
				◯ Independent ◯ Extension				
				◯ Independent ◯ Extension				

*If remodeling of existing structure, include water shut-down date and re-start date.

Comments/notes: