

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: _____

Date of environmental assessment: _____

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) <i>e.g.</i> , 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 (check 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 (check 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 <i>(e.g., instantaneous heater, water heater with a storage tank, solar heating)</i>	Name of System <i>(e.g., Boiler #1, Loop #1)</i>	Areas Served <i>(e.g., floor, rooms)</i>	Date of Installation	Total Capacity <i>(gallons)</i>	Usual Temperature Setting <i>(°F)</i>	Distal Outlet Temperature <i>(°F)</i>
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 (Month/Date/Year) ____/____/____

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 (Month/Date/Year) ____/____/____

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 (<i>e.g.</i> , chlorine, monochloramine, chlorine dioxide, copper-silver)	Date Installed	Serves Hot, Cold, or Both	Maintenance Personnel and Contact Information (in-house or consultant)

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 Copy from table for Question 19	Name of System <i>(e.g., incoming water, boiler #1, loop #1)</i> Copy from table for Question 19	Part of System <i>(Central heater/boiler=C Proximal occupant room=P Distal occupant room=D)</i>	Sampling Site <i>(e.g., heater #1, hot water tap in room #436)</i>	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)

Comments/notes: _____

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				
Max. bather load				
Filter type S = sand DE = diatomaceous earth C = cartridge				
Date filter was last changed				
Frequency of filter/filter media replacement				
Date of last filter backwash				
Frequency of filter backwash				
Compensation tank present				
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)				

Hot Tub Questions	Hot Tub 1	Hot Tub 2	Hot Tub 3	Hot Tub 4
Date last drained and scrubbed				
Water replacement frequency (<i>e.g.</i> , complete drain and refill)				
Was there a recent (<i>e.g.</i>, past 2 weeks) disinfectant “shock” treatment? If YES, describe reason and procedures. Provide SOP if available.				
Operating as designed and in good repair If NO, describe issues.				

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 (<i>e.g.</i> , lobby fountain, cabana misters)				
Is the device equipped with a filter? If YES, record type.				
Indoor or outdoor?				
Source of water				
Operates continuously (C) or intermittently (I)				
Presence of a heat source? (<i>e.g.</i> , incandescent lighting)				
Current water temperature				
Type of disinfectant used Include chemical name, formulation, and amount used.				
Current measured disinfectant level (<i>e.g.</i> , free chlorine, bromine) (ppm)				
Current measured pH				

Water Feature Questions	Location #1	Location #2	Location #3	Location #4
Is there a maintenance protocol?				
Date last cleaned and/or flushed				
Operating as designed and in good repair? If NO, describe issues.				

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 Independent = I Extension of existing system = E	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

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

Comments/notes: _____

