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 assist facility management with minimizing the risk of legionellosis. It can be used along with epidemiologic information to determine whether to conduct Legionella environmental sampling and to develop a sampling plan. The assessment should be performed on-site by an epidemiologist and an environmental health specialist with knowledge of the ecology of Legionella. Keep in mind that conditions promoting Legionella amplification include water stagnation, warm temperatures (77–108°F or 25–42°C), availability of organic matter, and lack of residual disinfectant such as chlorine. For training and information, please visit CDC’s legionellosis resources webpage at: https://www.cdc.gov/legionella/outbreak-toolkit/.

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). Completion of the form may take several hours.

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 blueprints available for the meeting.
- Bring a plastic bottle, thermometer, pH test kit, and a chlorine test kit that can detect a wide range of residual disinfectant (<1 ppm for potable water and up to 10 ppm for whirlpool spas).
- If the epidemiologic information available suggests a particular source (e.g., whirlpool spa, cooling tower), request that they shut it down (but do not drain or disinfect) in order to stop transmission.

INSTRUCTIONS FOR MEASURING WATER PARAMETERS IN THE PREMISE PLUMBING (TABLE P. 8)

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 amplification.

**STEP 1:** Plan a sampling strategy that incorporates all central hot water heaters/boilers 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.

**STEP 2:** For each sampling point (e.g., tap in an occupant room):

- **a.** Turn on the hot water tap. Collect the first 50 ml from the tap. Measure the free chlorine residual and pH. Document the findings in the table on p. 8. Note: If there is no residual chlorine in the hot water, measure it in the cold water. Note: Total chlorine should be measured instead of free chlorine if the method of disinfection is not chlorine (e.g., monochloramine).
- **b.** Allow the hot water tap to run until it is as hot as it will get. Collect 50 ml and measure the temperature. Document the temperature and the time it took to reach the maximum temperature.
LESIONELLA 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 assessment:
Name: ___________________________  Job Title: ___________________
Name: ___________________________  Job Title: ___________________
Name: ___________________________  Job Title: ___________________

Facility Characteristics
1. Is this a healthcare facility or senior living facility with skilled nursing care (e.g., hospital, long term care/rehab/assisted living/skilled nursing facility, or clinic)?
   ☐ YES  ➔ If yes, skip to Q.3 & also complete Appendix A.
   ☐ NO

2. If NO, indicate type of facility (check all that apply):
   ☐ Senior living facility (e.g., retirement home without skilled nursing care)
   ☐ Other residential building (e.g., apartment, condominium)
   ☐ Hotel, motel, or resort
   ☐ Recreational facility (e.g., health club, water park)
   ☐ Office building
   ☐ Manufacturing facility
   ☐ Restaurant
   ☐ Other ________________________________________________________

3. Total number of buildings on campus: __________  Total number of buildings being assessed: __________

4. Total number of rooms that can be occupied overnight (e.g., patient rooms, hotel rooms): __________

5. Does occupancy vary throughout the year?  ☐ YES  ☐ NO
   If YES, seasons with lowest occupancy (check all that apply):
   ☐ Winter  ☐ Spring  ☐ Summer  ☐ Fall

6. Are any occupant rooms taken out of service during specific parts of the year, e.g., low season?
   ☐ YES  ☐ NO
   If YES, which rooms? ________________________________________________________
7. Average length of stay for occupants (check one):
   ❑ 1 night  ❑ 2–3 nights  ❑ 4–7 nights  ❑ >7 nights

8. 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? ________________________________

9. Are there any cooling towers or evaporative condensers on the facility premises?
   ❑ YES ➔ If yes, also complete Appendix B.
   ❑ NO

10. Are there any whirlpool spas, hot tubs, or hydrotherapy spas on the facility premises?
    ❑ YES ➔ If yes, also complete Appendix C.
    ❑ NO

11. Are there any decorative fountains, misters, water features, etc. on the facility premises?
    ❑ YES ➔ If yes, also complete Section D.
    ❑ NO

12. 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:
                  __________________________________________________________
                  __________________________________________________________

13. Has there been any recent (last 6 months) or ongoing major construction on or around the facility premises?
    ❑ YES ➔ If yes, also complete Appendix E.
    ❑ NO

14. Has this facility been associated with a previous legionellosis cluster or outbreak?
    ❑ YES  ❑ NO
    If YES, please describe number of cases, dates, source if found, and any interventions (immediate and long-term) to prevent recurrence:
                  __________________________________________________________
                  __________________________________________________________
                  __________________________________________________________

15. Does the facility have a water safety plan or Legionella prevention program?
    ❑ YES  ❑ NO
    If YES, does the facility ever test for Legionella in water samples?
    ❑ YES ➔ If yes, obtain copies of results  ❑ NO
    If YES, please describe the plan briefly here (does it include clinical disease surveillance and/or environmental Legionella surveillance?) and obtain a written copy of the program policy:
                  __________________________________________________________
                  __________________________________________________________
                  __________________________________________________________

16. Describe each building that shares water or air systems, including the main facility

<table>
<thead>
<tr>
<th>Building Name (List main facility building first)</th>
<th>Original Construction Year Completed</th>
<th>Later Construction (renovation, expansion) From/To or “N/A”</th>
<th>Stories or Levels #</th>
<th>Occupancy rate (%)* Rate (%) or “N/A”</th>
<th>Daily Census (yr. avg.) #/day or “N/A”</th>
<th>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</th>
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*occupancy rate = (# of rooms occupied overnight / total # of rooms) X 100
17. What is the source of the water used by the facility? (Check all that apply)

- **Municipal water** 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 ____________________________

- **Non-municipal well** if YES:
  - How is the well water disinfected? (Check one)  
    - ☐ Chlorine
    - ☐ Other ________
    - ☐ Not disinfected
  - Is the water filtered onsite?  
    - ☐ YES  
    - ☐ NO

- **Other** ____________________________________________

18. Have there been any pressure drops, boil water advisories, or water disruptions (e.g., water main break) to the facility in the past 6 months?  
- ☐ YES  
- ☐ NO

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

19. 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? ____________________________
________________________________________________________________________
________________________________________________________________________

20. Are cisterns and/or water storage holding tanks used to store potable water before it’s heated?

- ☐ YES  
- ☐ NO

21. 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: ____________________________
________________________________________________________________________
________________________________________________________________________

22. Are thermostatic mixing valves used?

- ☐ YES  
- ☐ NO

If YES, describe where they are located (ideally, mixing valves are close to the point of use): ____________________________
________________________________________________________________________
________________________________________________________________________
23. How is the hot water system configured to deliver hot water to each building?

<table>
<thead>
<tr>
<th>Building Name</th>
<th>Type of system (e.g., instantaneous heater, hot water heater with a storage tank, solar heating)</th>
<th>Name of system (e.g., Boiler #1, Loop #1)</th>
<th>Areas served (e.g., floor, rooms)</th>
<th>Date of installation</th>
<th>Total capacity (gallons)</th>
<th>Usual temperature setting (°F)</th>
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</table>

Comments/notes:___________________________________________________________________________________________________________________________________________
__________________________________________________________________________________________________________________________________________
__________________________________________________________________________________________________________________________________________
24. What is the maximum hot water temperature at the point of delivery permitted by state / local regulations? 
   _______ °F or _______ °C

25. 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

26. 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) ______/_____/______
   ❑ NO

27. 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 ________________________________
   ❑ NO

28. Does the facility have a supplemental disinfection system for long term control of Legionella or other microorganisms?
   ❑ YES ❑ NO
   If YES, obtain SOPs for routine use and maintenance as well as maintenance logs and records of disinfection levels, and complete the table:

<table>
<thead>
<tr>
<th>Buildings with supplemental disinfection</th>
<th>Type of system (e.g., chlorine, chlorine dioxide, copper-silver)</th>
<th>Date installed</th>
<th>Describe any maintenance in the past year (include routine and emergency)</th>
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   Comments/Notes: ________________________________________________________________
   ________________________________________________________________
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29. Please describe any maintenance (either routine or emergency) carried out on the potable water system in the past year. Obtain records/SOPs if available. ________________________________________________________________
    ________________________________________________________________
    ________________________________________________________________
    ________________________________________________________________
30. Measured Water System Parameters (see instructions on p. 1)

<table>
<thead>
<tr>
<th>Building name</th>
<th>Name of system</th>
<th>Part of system</th>
<th>Sampling site</th>
<th>Free chlorine</th>
<th>pH</th>
<th>Maximum measured temperature</th>
<th>Time to reach max temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy from table for question 23 (p. 6)</td>
<td>Copy from table for question 23 (p. 6)</td>
<td>(Central heater/boiler=C)</td>
<td>(e.g., heater #1, hot water tap in room #436)</td>
<td>(ppm)</td>
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<td>(°F)</td>
<td>(min)</td>
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<td>Proximal occupant room=P</td>
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<td>Distal occupant room=D</td>
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APPENDIX A. HEALTHCARE FACILITIES

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

1. 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
   - [ ] Outpatient surgical center
   - [ ] Other outpatient clinic (describe): __________________________________________________________
   - [ ] Other healthcare facility (describe): __________________________________________________________

2. Number of beds: ____________

3. 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: ______________________________________________

4. Has this facility experienced previous Legionnaires' disease cases that were “possibly” or “definitely” facility-acquired?
   - [ ] YES  [ ] NO
   - If YES, describe (e.g., number of cases, dates): ____________________________________________________
     ____________________________________________________
     ____________________________________________________
     ____________________________________________________
Note: It is important to gain an understanding of where the cooling towers are located, how they work, and how they are maintained. Cooling towers are frequently maintained by an outside contractor, and you may need to contact them directly if facility management does not have an in-depth knowledge of these systems. Request copies of the maintenance logs.

1. List all cooling towers and evaporative condensers on the facility premises:

<table>
<thead>
<tr>
<th>Name of device (e.g., CT1)</th>
<th>Date Installed</th>
<th>Manufacturer</th>
<th>Location of device</th>
<th>Distance to nearest air intake*/location of the air intake/passive or forced</th>
<th>Drift eliminators used? (Y/N)</th>
<th>Party responsible for maintenance</th>
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*Intakes to air handling units (AHUs)

2. List details of how each cooling tower is chemically disinfected:

<table>
<thead>
<tr>
<th>Name of device from Table 1 (e.g., CT1)</th>
<th>List type/name of bactericide(s) used</th>
<th>Range in which the bactericide(s) is regularly maintained (e.g., 5–10 ppm)</th>
<th>Schedule and method of adding bactericide (e.g., daily, weekly, as needed, automatic, by hand)</th>
<th>Are cooling towers turned off at any time? (e.g., seasonally) (Y/N) If yes, include schedule</th>
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</table>
3. List recent (last 6 months) special (non-routine) treatments, maintenance, or repairs to cooling devices:

<table>
<thead>
<tr>
<th>Name of device from Table 1 (e.g., CT1)</th>
<th>Action taken</th>
<th>Date</th>
<th>Comments</th>
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4. Does the cooling tower water come from a branch of the potable water system inside the facility?
   - YES  - NO
   If YES, are backflow prevention devices in place to ensure cooling tower water is not introduced into the potable water system?
   - YES  - NO
   If NO, what is the source of water for the cooling towers and evaporative condensers?  
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

5. Can any windows in any occupant rooms or common areas be opened?  
   - YES  - NO
   If YES, describe which rooms or which buildings have windows that can be opened:  
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
APPENDIX C. WHIRLPOOL SPAS, HOT TUBS, AND HYDROTHERAPY SPAS

Note: Do NOT complete Appendix C for Jacuzzis or whirlpool baths that are filled from the tap and drained after each use. In many jurisdictions, whirlpool spas are publicly permitted and inspected by the local health authority. An environmental health specialist with expertise in pool and spa inspection should participate in assessment of spas and will be aware of local regulations and enforcement powers, as well as have access to a pool sampling kit. Request copies of the last inspection report as well as routine maintenance logs.

1. Who performs the spa maintenance (e.g., on-site facilities management, name of outside contractor)? ___________________

2. Describe each whirlpool spa and how it is disinfected:

<table>
<thead>
<tr>
<th>Spa Questions</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Location 3</th>
<th>Location 4</th>
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<tbody>
<tr>
<td>Spa Descriptor/Location (e.g., main, private room #)</td>
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<td>Indoor or outdoor?</td>
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<td>S = sand</td>
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<td>DE = diatomaceous earth,</td>
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<td>C = cartridge</td>
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<td>Date filter was last changed</td>
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<td>Date of last filter backwash</td>
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<td>Compensation tank present?</td>
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<td>Type of disinfectant used</td>
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<td>formulation, and amount used)</td>
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<td>Current measured disinfectant</td>
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<td>level (e.g., free chlorine, bromine) (ppm)</td>
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<td>Current measured pH</td>
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<td>Method used for adding disinfectant</td>
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<td>(e.g., automatic feeder, by hand)</td>
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<td>Method used for monitoring and</td>
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<td>maintaining disinfectant and pH</td>
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<td>levels (e.g., automatic controllers)</td>
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<td>Date last drained and scrubbed</td>
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<td>Was there a recent disinfectant</td>
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<tr>
<td>Operating as designed and in good</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>repair?</td>
<td></td>
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</tr>
<tr>
<td>If no, describe issues.</td>
<td></td>
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</tbody>
</table>
APPENDIX D. OTHER WATER FEATURES

Note: Complete for decorative fountains, water walls, recreational misters, etc. This can also be modified for industrial use water. If SOPs and/or maintenance logs exist, request copies.

<table>
<thead>
<tr>
<th>Water Feature Questions</th>
<th>Location #1</th>
<th>Location #2</th>
<th>Location #3</th>
<th>Location #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptor/Location</td>
<td></td>
<td></td>
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<tr>
<td>(e.g., lobby fountain, cabana misters)</td>
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<tr>
<td>Indoor or outdoor?</td>
<td></td>
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<tr>
<td>Source of water</td>
<td></td>
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<tr>
<td>Operates continuously (C) or intermittently (I)</td>
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<tr>
<td>Presence of a heat source?</td>
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<tr>
<td>(e.g., incandescent lighting)</td>
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<tr>
<td>Type of disinfectant used</td>
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<tr>
<td>(include chemical name, formulation, and amount used)</td>
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<tr>
<td>Current measured disinfectant level</td>
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<tr>
<td>(e.g., free chlorine, bromine) (ppm)</td>
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<tr>
<td>Current measured pH</td>
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<tr>
<td>Is there a maintenance protocol?</td>
<td></td>
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<tr>
<td>Date last cleaned</td>
<td></td>
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<tr>
<td>Operating as designed and in good repair? If no, describe issues.</td>
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</tbody>
</table>
APPENDIX E. RECENT OR ONGOING MAJOR CONSTRUCTION

1. Describe in general the extent of the construction: __________________________________________________________
                                                                 ____________________________________________
                                                                 ____________________________________________
                                                                 ____________________________________________

2. Was temporary water service provided to the new construction area (i.e., separate meter)?
   ❑ YES  ❑ NO
   If YES, describe: _____________________________________________________________________________________
                                                                 ____________________________________________

3. Has jack-hammering or pile-driving been used during the construction process?
   ❑ YES  ❑ NO
   If YES, list dates and locations: ______________________________________________________________________
                                                                 ____________________________________________

4. Have there been disruptions or changes to the existing potable water system during the construction?
   ❑ YES  ❑ NO
   If YES, describe: _____________________________________________________________________________________
                                                                 ____________________________________________

5. Has the potable water changed in terms of taste or color during the construction process?
   ❑ YES  ❑ NO
   If YES, describe the changes including when they started and ended: __________________________________________
                                                                 ____________________________________________

6. Is there a standard operating procedure (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): _______________________________
                                                                 ____________________________________________

7. 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? ______________________
                                                                 ____________________________________________

8. Complete table on next page.
8. Complete the table below:

<table>
<thead>
<tr>
<th>New Building/Wing Name or Remodeled Area</th>
<th>Date construction began</th>
<th>Estimated date of completion</th>
<th>Date water service began or restarted*</th>
<th>Relationship to existing potable water system</th>
<th>Stories and Square Feet Involved (# and Ft²)</th>
<th>Uses (e.g., rooms, dining, recreation, utilities)</th>
<th>Date occupants began occupying new or remodeled building</th>
<th>Floors currently occupied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>(e.g., rooms, dining, recreation, utilities)</td>
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<td>For healthcare: Inpatient = I Outpatient = O Both = B Intensive Care = ICU Transplant = Tx</td>
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<td></td>
</tr>
</tbody>
</table>

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