Environmental Assessment of Water Systems

Assessor’s Name: _________________________________ Facility Name: ____________________________
Assessor’s Title: __________________________________ Facility Address:  ____________________________
Assessor’s Organization: ___________________________           ____________________________
Assessor’s Address: _______________________________   ____________________________
Assessor’s Telephone Number: ______________________   ____________________________
Date of assessment: _______________________________ Type of Assessment: (Circle one)
Time of assessment: _______________________________   On-site assessment
Time needed to complete assessment: _________________   Telephone assessment

Note to Assessor:

This environmental assessment instrument may be used where a thorough understanding of a facility’s water system is needed to assist facility management in minimizing the risk of legionellosis either in the presence or absence of disease transmission. It should be completed in as much detail as possible. Not all the information specified may be available for or applicable to every facility. For very large, complex facilities, completion of the form may take several hours. Please keep in mind that this initial investment of time is important. If reassessment is needed in subsequent months or years, the information contained in this document will be very valuable. Do not leave sections blank. If a question does not apply, write “N/A”. If a question cannot be answered, explain why. Where applicable, specify the units of measurement being used (e.g., ppm). It is recommended that if the form is being completed electronically, a different font and/or italics should be used. This will make the information much easier to read if additional information is added in the future.

A. Facility Characteristics

1. Type of facility (Circle one):
   a. Healthcare facility
      • Hospital with bone marrow or solid organ transplant patients
      • Hospital without bone marrow or solid organ transplant patients
      • Outpatient facility with bone marrow or solid organ transplant patients
      • Outpatient facility without bone marrow or solid organ transplant patients
      • Long-term care facility
      • Outpatient surgical center
   b. Hotel, motel
   c. Residential building (e.g., apartment, condominium)
   d. Office building
   e. Manufacturing facility
   f. Restaurant
   g. Recreational facility (e.g., health club, water park)
   h. Other ________________________________

2. Total number of buildings in facility ___________
3. Total number of rooms that can be occupied overnight (e.g., patient rooms, occupant rooms, hotel rooms): ______

4. Total overnight occupant capacity: ______

5. Average occupancy over previous 12 months as a percentage of total capacity: ______

6. If occupancy varies throughout the year, indicate seasons with highest occupancy (circle all that apply):
   - Spring
   - Summer
   - Winter
   - Fall

7. Are any occupant rooms taken out of service during specific parts of the year, e.g., low season? If yes, indicate which rooms
   ____________________________________________________________

8. Average length of stay for occupants (Circle one):
   a. 1 night
   b. 2-3 nights
   c. 4-7 nights
   d. >7 nights

9. Owner of facility is (Circle one):
   - Private individual(s)
   - Corporation
   - Other ____________________
10. Description of each building that shares water or air systems with the facility (and including the main facility):

<table>
<thead>
<tr>
<th>Building Name</th>
<th>Original Construction</th>
<th>Later Construction (renovation, expansion)</th>
<th>Stories</th>
<th>Sq. feet</th>
<th>Occupant rooms*</th>
<th>Census (yr. avg.)</th>
<th>Use</th>
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</thead>
<tbody>
<tr>
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<td>Year Completed</td>
<td>From/To or N/A</td>
<td>#</td>
<td># or NA</td>
<td>#/day or NA</td>
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<td>e.g., occupant rooms, utilities, heating/AC plant, potable water</td>
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*Occupant room is defined as a room that can be occupied overnight such as a patient room or a hotel room.
11. Can windows in any occupant rooms be opened?  Yes  No  
   a. If only some occupant rooms have windows that can be opened, what is the overall proportion of occupant rooms 
      with windows that can be opened? ___________________________  

12. Are there decorative fountains, misters, water features, or any other aerosol-generating devices anywhere on the facility premises?  Yes  No  
   If yes, please describe and indicate their location and operation_________________________________________________________  
   ____________________________________________________________  
   ____________________________________________________________  

13. Has this facility been associated with a previous legionellosis cluster or outbreak?  Yes  No  
   If yes, please describe (e.g., number of cases, dates):  
   If yes, please describe (e.g., number of cases, dates):  
   If yes, please describe (e.g., number of cases, dates):  

14. Does the facility have a Legionella prevention or monitoring program?  Yes  No  
   If yes, please describe______________________________________________________________________________________  
   ____________________________________________________________  
   ____________________________________________________________  

B. Outside water supply  
   1. What is the source of the water used by the facility?  
      [Check all that apply]  
      ___ Municipal water  
      ___ Well  
      ___ Other _______________  
      If facility is served by municipal water, please answer the remaining questions, otherwise skip to section C.  
   2. Name of supplier ____________________________________________  
   3. How is municipal water disinfected? (Circle one)  
      Chlorine  Monochloramine  No residual disinfectant  Other _______________  
   4. Has treatment of municipal water changed in the last six months?  Yes  No  
      If yes, specify ____________________________________________________________  
      ____________________________________________________________  
      ____________________________________________________________  
C. Design of the existing potable water system(s) [Note: A schematic diagram on a separate page and facility blueprints are useful for demonstrating the design]:

1. What type of heating system is used for the potable hot water system?
   [Check all that apply]
   ___ Instantaneous heaters without storage of hot water
   ___ Heaters with hot water storage tanks
   ___ Other [Please describe] ___________________________________________

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

<table>
<thead>
<tr>
<th>Building name</th>
<th>Type of system (I=Instant H=Heater/boiler)</th>
<th>Name of system (e.g., Boiler #1, Loop #1)</th>
<th>Date of installation</th>
<th>Total capacity (gallons)</th>
<th>Usual temperature setting (°F/°C)</th>
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</table>

3. 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 (including delivery and return temperatures):
   __________________________________________________________________________
   __________________________________________________________________________

4. What is the maximum hot water temperature at the point of delivery permitted by state / local regulations?
   ______ °F or ______ °C

5. What are the lowest documented hot water temperatures measured at any point within the facility?
   ______ °F or ______ °C
   When were these measurements made (Month/Date/Year)? ______/_____/______
6. What are the **highest** documented **cold** water temperatures measured at any point within the facility?
   
   _____ °F  or  _____ °C

   When were these measurements made (Month/Date/Year)? _____/_____/_____

7. Are thermostatic mixing valves used anywhere in occupant areas?  Yes  No
   
   If yes, where? Please describe____________________________________________________________________________
   
   _______________________________________________________________________________________________________

8. Does the facility have a water softener on site?  Yes  No
   
   If yes, please describe (including routine service)
   
   _______________________________________________________________________________________________________
   
   _______________________________________________________________________________________________________

9. Are the potable water chlorine levels measured?  Yes  No
   
   If yes, how often? ______________________________________________________________________________________
   
   If yes, what is the range of residuals in each system __________________________________________________________

   Please describe any regularly scheduled maintenance carried out on the hot water system.

   _______________________________________________________________________________________________________
   
   _______________________________________________________________________________________________________

10.Measured parameters:

    The following page includes a table for documenting the physical/chemical characteristics of the potable water system. Before performing these measurements, it is useful to 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 system and another at the farthest point (distal) of the loop should be sampled. Also, if there are aerosol-generating devices (e.g., misters, decorative fountains) that are not located in occupant rooms, these should also be assessed. Because Legionella amplifies in warm (25-42°C), stagnant water, it is useful to document temperatures, chlorine residuals, and pH in hot potable water.

    **Recommended procedure for measuring physical/chemical characteristics**

    For each sampling point (e.g., tap in an occupant room):
    a. Turn on the hot water tap. Collect the first 50cc from the tap. Measure the temperature, pH, and chlorine residual. Document the findings in the table on the following page.
    b. Allow the hot water tap to run for 2-3 minutes. Collect 50cc and measure the temperature, pH, and chlorine residual. Document the findings in the table on the following page.
<table>
<thead>
<tr>
<th>Building name</th>
<th>Name of system (e.g., Boiler #1, Loop #1)</th>
<th>Area of system (Central heater/boiler=C; proximal occupant room=P; distal occupant room=D)</th>
<th>Sampling site (e.g., heater #1, tap in occupant room #436)</th>
<th>Type of sample (First, 2-minute)</th>
<th>Temperature (°F/°C)</th>
<th>Chlorine residual (ppm)</th>
<th>pH</th>
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</table>
D. Whirlpool spas & hot tubs

1. How many total spas and/or hot tubs are located on the premises? _______

2. Spa features

<table>
<thead>
<tr>
<th>Spa number</th>
<th>1</th>
<th>2</th>
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<tbody>
<tr>
<td>Location</td>
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<td>Max. bather load</td>
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<td>Filter maintenance routine</td>
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<tr>
<td>Type of disinfectant used (include chemical name, formulation, and amount used)</td>
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<td>Method used for adding disinfectant</td>
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<td>Date last drained and scrubbed</td>
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3. Have any of the spas been “shocked” recently? If so, when and why? ____________________________________________
D. Cooling towers and evaporative condensers.

1. Use the following table to list all cooling towers and evaporative condensers on the facility premises:

<table>
<thead>
<tr>
<th>Name of device (e.g., CT1, EC2)</th>
<th>Manufacturer</th>
<th>Water capacity (gallons)</th>
<th>Tonnage</th>
<th>Type of disinfects / chemicals used &amp; frequency (continuous, daily, weekly, irregular/intermittent)</th>
<th>Drift eliminators used (Y/N)</th>
<th>Location of device</th>
<th>Distance to nearest air intake* / location of the air intake</th>
<th>Are cooling towers turned off at any time (Y/N)? If yes, include schedule</th>
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</table>

*intakes to air handling units (AHUs)
2. Recent (last 6 months) special (non-routine) treatments, maintenance or repairs to cooling devices:

<table>
<thead>
<tr>
<th>Location</th>
<th>Name of device (e.g., CT1, EC2)</th>
<th>Action taken</th>
<th>Date</th>
<th>Comments</th>
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3. What is the source of water for the cooling towers and evaporative condensers?
   [Please specify] ________________________________________________
   ________________________________________________

4. Does the cooling tower water come from a branch of the potable water system inside the facility? **Yes** **No**
E. For recent (last 6 months) or ongoing construction (Summarize the construction activities in the following table):

<table>
<thead>
<tr>
<th>New Building Name</th>
<th>Date construction began</th>
<th>Relationship to existing potable water system</th>
<th>Date water service began</th>
<th>Estimated date of completion</th>
<th>Stories</th>
<th>Sq. ft</th>
<th>Used by occupants?</th>
<th>Uses</th>
<th>Date occupants began occupying building</th>
<th>Floors currently occupied by occupants</th>
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<tr>
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<td>Independent=I; Extension of existing system=E</td>
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1. Was temporary water service provided to the new construction area (i.e., separate meter)?
   - Yes
   - No
   - If so, describe: ____________________________________________________________________________________________________________

2. Has jack-hammering or pile-driving been used during the construction process?
   - Yes
   - No
   - If so, describe (dates, location): __________________________________________________________________________________________

3. If the new building construction includes an extension of the existing potable water system, what part of the new building does the existing potable water system serve? ____________________________________________
4. If the new building construction includes an extension of the existing potable water system, have disruptions/changes to existing potable water system during the construction been reported?
   Yes  No
   If so, describe:

5. Do you have 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 (attached a copy if possible):

   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

6. Has the potable water changed in terms of taste or color during the construction process?
   Yes  No
   If so, describe the changes including when the potable water change started and ended:

   __________________________________________________________
   __________________________________________________________

7. Have there been any water main breaks, interruptions, or potable water malfunctions in the past 6 months?
   Yes  No
   a. If “Yes”, describe (which buildings were affected, beginning and end dates, etc.):

       __________________________________________________________
       __________________________________________________________
       __________________________________________________________

e. If “Yes”, was any soil material introduced into the pipe(s) during these times?
   Yes  No

c. If “Yes”, please describe any steps taken to remediate the water.

       __________________________________________________________
       __________________________________________________________
       __________________________________________________________
8. Before occupying the new building space, was a commissioning process undertaken?
   Yes       No
   a. If “Yes”, describe (who performed the commissioning, when was it completed, etc.):
      __________________________________________________________
      __________________________________________________________
      __________________________________________________________
   b. Is a commissioning report available for review?
      Yes       No

9. Does the facility regularly test the fire protection system (i.e. sprinkler head flow tests)?
   a. If so, how often? _________________________
   b. What precautions are taken to protect staff and patrons from aerosols during testing of sprinkler heads?
      __________________________________________________________

10. Additional Comments:
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________
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Please return to front page and indicate time needed to complete assessment.