

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 assist 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 or spread. The assessment should be performed on-site by an epidemiologist and/or an environmental health specialist with knowledge of the ecology of *Legionella*, building water systems, and water treatment.

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. Germs 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 Toolkit for Controlling *Legionella* in Common Sources of Exposure for detailed guidance on evaluating the key factors for *Legionella* growth in specific water systems and devices (<https://www.cdc.gov/legionella/wmp/control-toolkit/index.html>). For additional training and information, please visit CDC's legionellosis resources webpage at: <https://www.cdc.gov/legionella/outbreak-toolkit/>.

SAFETY PRECAUTIONS

The facility should be notified in advance to turn off (but do not drain or disinfect) any aerosol-generating devices to minimize the risk to the sampling team. Persons at an 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 whirlpool spa 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, 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.

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 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 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. Did the facility recently experience (last 12 months) a period of prolonged, reduced occupancy, or a building closure?
 YES NO
 If YES, which rooms/buildings? _____
8. Describe any interventions taken as a result (e.g., flushing, hyperchlorination):

9. Average length of stay for occupants (check one):
 1 night 2–3 nights 4–7 nights >7 nights
10. 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? _____
11. Are there any cooling towers or evaporative condensers on the facility premises?
 YES → If yes, also complete Appendix B.
 NO
12. Are there any hot tubs, whirlpool spas, or hydrotherapy spas on the facility premises?
 YES → If yes, also complete Appendix C.
 NO
13. Are there any decorative fountains, misters, water features, etc. on the facility premises?
 YES → If yes, also complete Section D.
 NO
14. 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: _____

15. Does the facility have ice machines?
 YES NO
 If YES, list manufacturer and model: _____
16. Does the facility have a landscape irrigation or sprinkler system?
 YES NO
 If YES, describe their location and operation: _____

17. 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

18. 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: _____

19. 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: _____

20. Describe each building that shares water or air systems, 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:		
6.				High period: Low period:		
7.				High period: Low period:		

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

† List all types of uses e.g., occupant rooms, utilities, heating/AC plant.

Water Supply Source

21. 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 onsite? YES NO

Other _____

22. 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 (in public water system off premise and/or on facility property)? YES NO

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

23. 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 secondary disinfectants. Refer to a facility map and blueprints; *obtain copies of these and/or draw a diagram* and include with the completed assessment. Find additional recommendations specific to Potable Water Systems, see: <https://www.cdc.gov/legionella/wmp/control-toolkit/potable-water-systems.html>.

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

YES NO

25. Are water softeners used on incoming water?

YES NO

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

26. 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: _____

27. 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: _____

28. Are thermostatic mixing valves used?

YES NO

If YES, describe where they are located (ideally, mixing valves are close to the point of use): _____

Temperature set point: _____

29. 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: _____

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

31. 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

32. 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

33. 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

34. 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:

Buildings with supplemental disinfection	Type of system (e.g., chlorine, chlorine dioxide, copper-silver)	Date installed	Maintenance Personnel and Contact Information (in-house or consultant)

Comments/notes: _____

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

36. 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* amplification—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):

- a. Note: Total chlorine should be measured instead of free chlorine if the method of disinfection is not chlorine (e.g., monochloramine).
- b. 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. Repeat for the cold water after letting the tap run for 30 seconds.

Building name Copy from table for question 23 (p. 6)	Name of system (e.g., incoming water, Boiler #1, Loop #1) Copy from table for question 23 (p. 6)	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 min temp (°F)	Time to reach max temp (min)

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. Does this facility use respiratory therapy equipment (e.g., CPAP, bronchoscopes, heater-cooler units)?

YES NO

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

5. Has this facility experienced previous Legionnaires' disease cases that were "possibly" or "presumptively" facility-acquired?
Note: "Possible" healthcare-acquired disease is defined as a case that 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. "Presumptive" healthcare-acquired disease is defined as a case with greater than or equal to 10 days of continuous stay at a healthcare facility during the 14 days before onset of symptoms.

YES NO

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

HOW TO USE THIS GUIDE

This guide 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 plan needs to be modified. Information produced using this guide 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.

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 attached them to the report to visually support the written findings.



BEFORE ARRIVING ON-SITE

- Review CDC's summary of ASHRAE Guideline 12-2020 on Controlling *Legionella* in Cooling Towers: <https://www.cdc.gov/legionella/wmp/control-toolkit/cooling-towers.html>
- Request the attendance of the lead facility manager as well as others who have a detailed knowledge of the facility's water systems. Cooling towers are frequently 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 6- to 12-month time period.

WHAT IF THE COOLING TOWER LOCATION IS NOT KNOWN?

In legionellosis cluster investigations and other scenarios, the location of the cooling tower(s) may not be initially known. Investigation of community outbreaks requires fast and accurate identification of potential exposure sources, such as cooling towers. CDC has developed and tested one method to identify cooling towers, which can be found at the following location: <https://www.cdc.gov/legionella/health-depts/environmental-inv-resources/id-cooling-towers.html>.

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:

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 or industrial process)

General Cooling Tower Disinfection, Operation and Maintenance Characteristics

1. Disinfectant used in cooling tower(s) YES NO
2. If yes, what type of disinfectant is used? **Oxidizing** YES NO **Non-oxidizing** YES NO
3. List name(s) of disinfectant used (e.g., chlorine, bromine) _____
4. Target range in which the disinfectant is regularly maintained: _____
5. Type of disinfectant dosing system. **Hand fed?** YES NO
 Automatic dosing by chemical controllers? YES NO
6. Schedule of adding disinfectant (e.g., daily, weekly, as needed): _____
7. Are disinfectant levels monitored? YES NO
 How often and by whom? _____
 Are chemical metering pumps properly maintained and in good condition? YES NO
8. Scale and/or corrosion inhibitors used? YES NO
 Schedule of adding scale and corrosion inhibitors (e.g., daily, weekly, as needed): _____
9. Describe the scale/corrosion inhibitor dosing system. **Hand fed?** YES NO
 Automatic dosing by chemical controllers? YES NO
10. Is there an adequate supply (at least 30 days) of chemicals on-hand? YES NO
 Is *Legionella* testing ever performed on the cooling tower? YES NO
 How often and by whom? _____
11. Is the cooling tower turned off at any time? YES NO
 If yes include schedule: _____
12. Are there start-up and shut-down procedures for the cooling tower? YES NO
 Describe: _____

Specific Cooling Tower Disinfection, Operation and Maintenance Characteristics

Tower ID	Observed Disinfectant Level	Observed Water Temperature	Observed Water pH

13. 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: _____

14. When was the cooling tower last cleaned? _____

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

Visual Inspection of Cooling Towers

15. Is pitting or other evidence of corrosion visible on internal metal surfaces? YES NO

Tower ID(s): _____

16. 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: _____

17. Biofilm build-up observed on cooling tower fill? YES NO

Tower ID(s): _____

Notes: _____

18. Poor water clarity observed in cooling tower basin (e.g., green color, extreme foam)? YES NO

Tower ID(s): _____

Notes: _____

Record Keeping Review

19. 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, hot tubs are publicly 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, as well as have access to a pool sampling kit. Request copies of the last inspection report as well as routine maintenance logs, if applicable. For additional information related to controlling *Legionella* in hot tubs, see: <https://www.cdc.gov/legionella/wmp/control-toolkit/hot-tubs.html>.

- Who operates and maintains the hot tub (e.g., on-site facilities management, name of outside contractor)? Describe their role and frequency of maintenance: _____
- 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)				
Date last drained and scrubbed				
Water replacement frequency (e.g., complete drain and refill)				

Hot Tub Questions	Hot Tub 1	Hot Tub 2	Hot Tub 3	Hot Tub 4
<p>Was there a recent (e.g., past two weeks) disinfectant “shock” treatment? If yes, describe reason and procedures. Provide SOP if available.</p>				
<p>Operating as designed and in good repair? If no, describe issues.</p>				

Additional notes/comments:

APPENDIX D. OTHER WATER DEVICES

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. For additional information related to controlling Legionella in other water features, see: <https://www.cdc.gov/legionella/wmp/control-toolkit/other-devices.html>.

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 so, record type.				
Indoor or outdoor?				
Source of water				
Operates continuously (C) or intermittently (I)				
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				

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.				

Additional notes/comments:

APPENDIX E. RECENT* OR ONGOING MAJOR CONSTRUCTION

*Previous 6–12 months.

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? _____

Complete table on next page.

8. 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 Ft ²)	Uses (e.g., 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.