# National Outbreak Reporting System (NORS)

# User Guidance – Waterborne Disease Outbreaks

Last updated 10/02/2017

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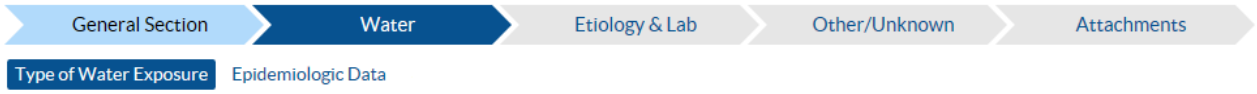
To access additional NORS resources, visit the NORS public website at www.cdc.gov/NORS.
To contact the CDC NORS Team, email NORSAdmin@cdc.gov.
For questions specific to waterborne disease outbreak reporting, email NORSWater@cdc.gov.

## 1. INTRODUCTION

This document is a reference manual for public health professionals who use the web-based National Outbreak Reporting System (NORS) to report waterborne disease outbreaks to CDC. NORS collects information on waterborne and foodborne disease outbreaks and enteric disease outbreaks transmitted by contact with environmental sources, infected persons or animals, or unknown modes of transmission. Waterborne disease outbreaks in NORS are reviewed for inclusion in the Waterborne Disease and Outbreak Surveillance System (WBDOSS). The WBDOSS, a collaboration between the Council of State and Territorial Epidemiologists (CSTE), the Centers for Disease Control and Prevention (CDC), and the Environmental Protection Agency (EPA), tracks, analyzes and describes waterborne disease outbreaks at a national level.

The guidance in this document has been organized to correspond to the sections in NORS. Sections in NORS for waterborne disease reporting include the General Section, Water section, Etiology & Lab section, the Attachments section, and one section for the type of water exposure (e.g., Drinking, Rec. Treated). In each section, there can be one or multiple tabs (e.g., Type of Water Exposure, Epidemiologic Data).




Note that only one type of water exposure section is completed for one outbreak report. A completed NORS report should contain the General Section, the Water section, the Etiology & Lab section, and one of the sections for the type of water exposure (e.g., "Drinking") implicated in the outbreak.

The CDC 52.12 form is also available online for states and territories to support internal reporting activities. The questions follow the same order as NORS. In the CDC 52.12 form, tabs have been placed at the top of each page. These tab names align closely with NORS section names. The NORS Etiology & Lab section has been broken out into two tabs on the form: Water-Etiology & Lab and Water Samples.

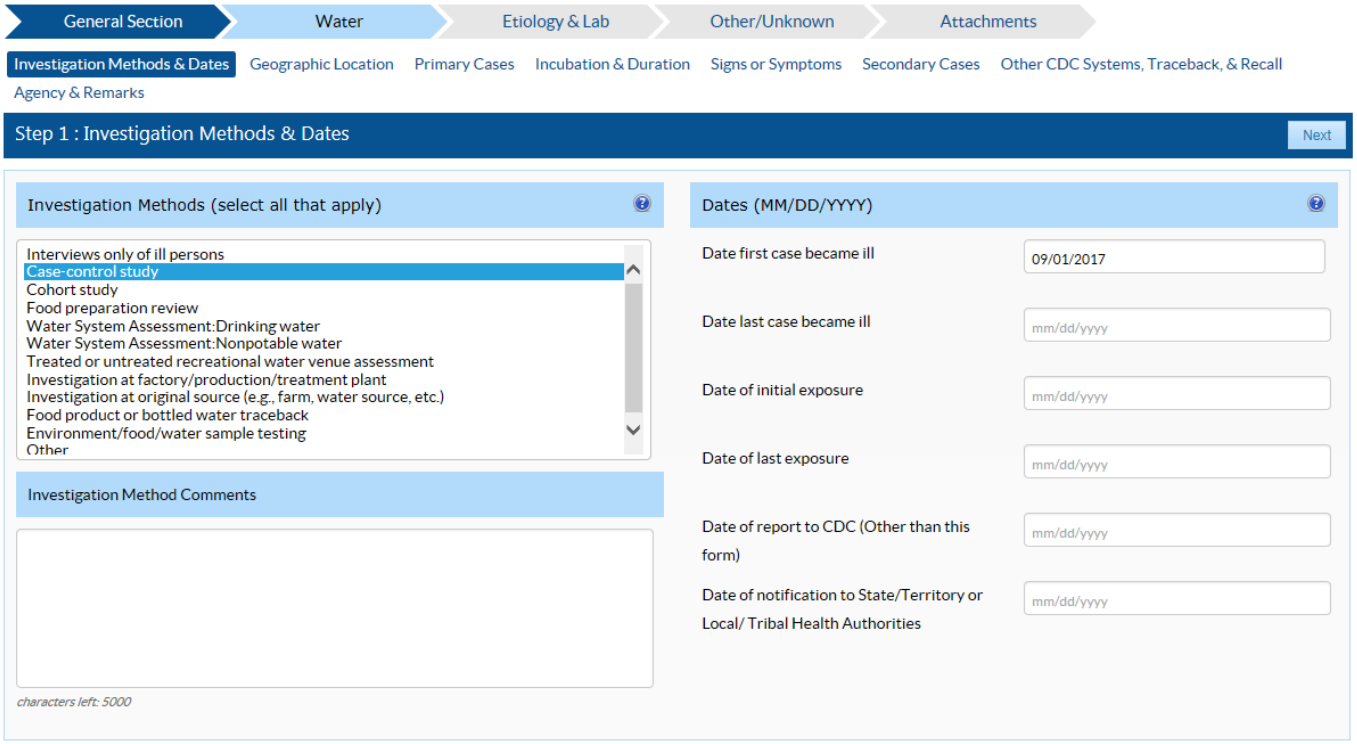
For some fields in NORS, a list of drop down list options are available in the NORS Waterborne Disease Reporting – Water List Values document. This document and other supporting NORS guidance materials can be found at www.cdc.gov/nors/forms.html.

Training documents that may assist NORS users with how to enter data into a waterborne NORS report can be found at www.cdc.gov/nors/training/waterborne.html.

## 2. GENERAL SECTION

Common questions (e.g., date(s) and geographic location(s)) about the outbreak are asked in the General Section for all modes of transmission (i.e., foodborne, waterborne, person–to–person, animal contact, environmental, and indeterminate/unknown).

For General Section reporting guidance, please refer to the Guidance Document on the NORS public website under the heading Foodborne Disease Outbreaks and Enteric Disease Outbreaks Transmitted by Contact with Persons, Animals, or Environmental Sources, or an Unknown Mode.

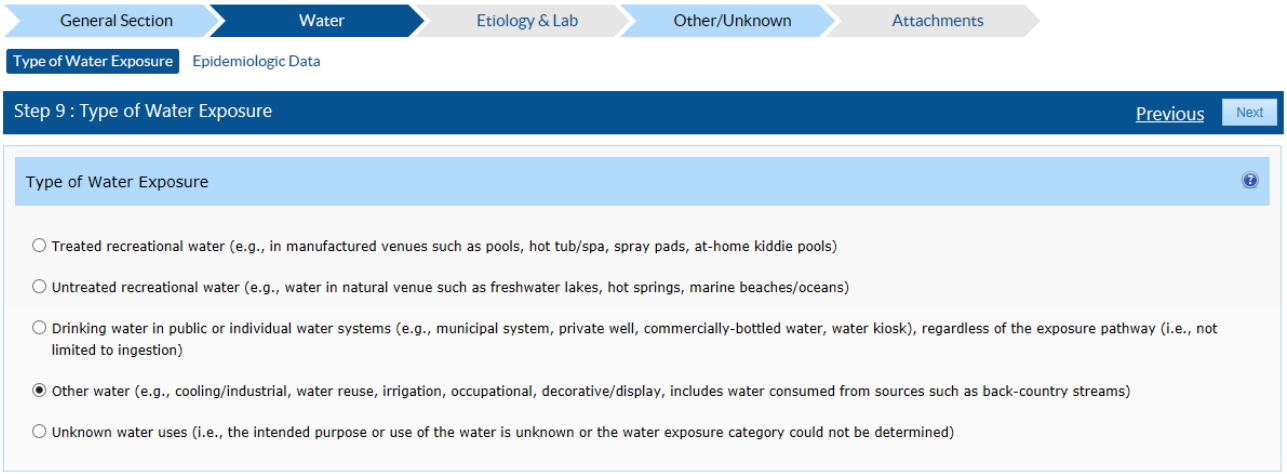


## 3. WATER – GENERAL SECTION

The Water Section collects information about the type of water implicated in the outbreak investigation and any epidemiologic information for the outbreak in two tabs: the Type of Water Exposure tab and the Epidemiologic Data tab.

### 3.1. Type of Water Exposure Tab

In the Type of Water Exposure tab, select a radio button for the Type of Water Exposure for water implicated in the outbreak investigation. Additional information about the outbreak may be attached to the outbreak report and/or included in the Remarks tab in the specific type of water exposure section.




**Type of Water Exposure:**

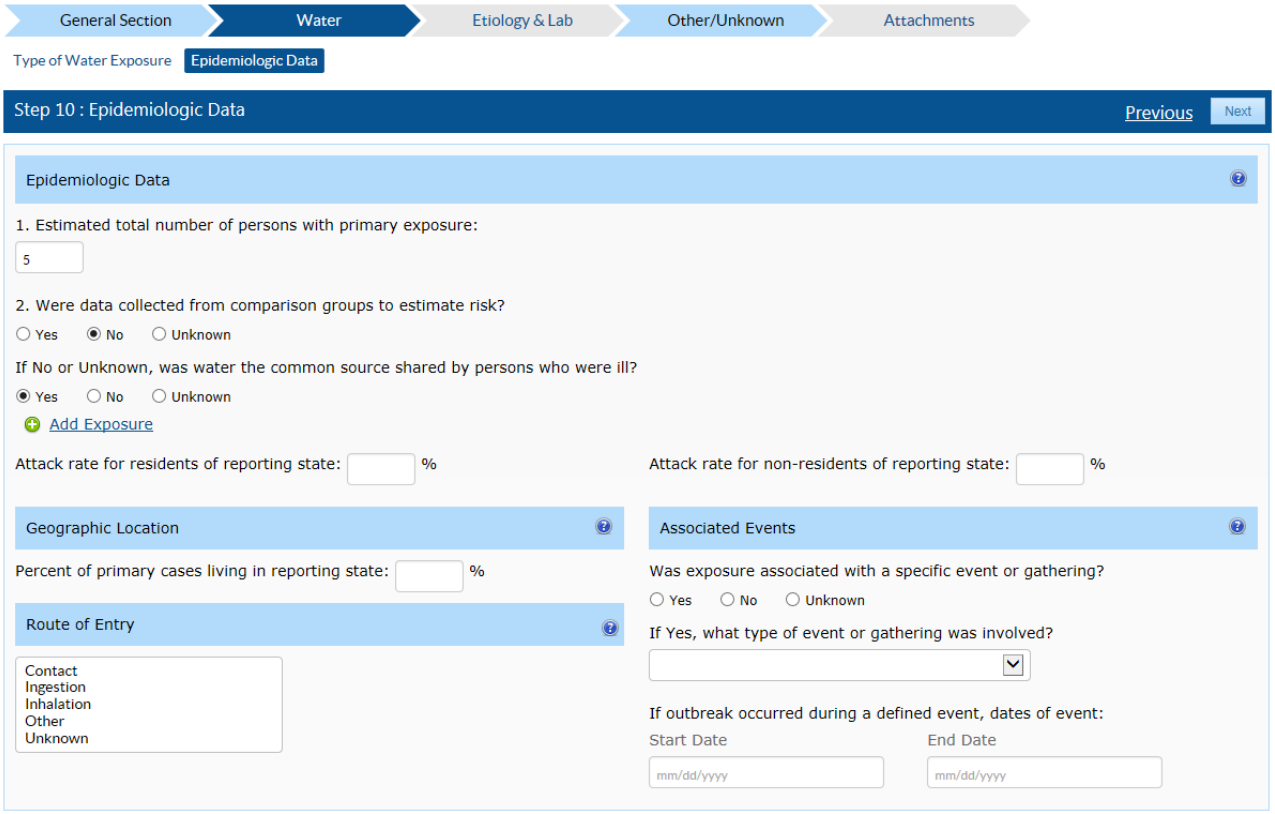
- **Treated Recreational Water** – Select this type of exposure if recreational water illnesses (RWIs) were associated with treated water. Examples include: cryptosporidiosis from a swimming pool; legionellosis from a whirlpool or hot tub; and giardiasis from an interactive fountain. Recreational water exposures in home environments, such as fill-and-drain kiddie pools, also fall into this category, as do illnesses stemming from chemical exposures (e.g., chloramines at an indoor pool, pH imbalances, and releases of chlorine gas in the water). If an outbreak involved both treated and untreated recreational venues, select the "Type of Water Exposure" that reflects the venue with the most compelling epidemiological and environmental evidence linking it to the waterborne disease outbreak or illness. If it is unclear which type of recreational water exposure to select, choose the type that reflects the first exposure experienced by the first reported case.
- **Untreated recreational water** – Select this type of exposure if RWIs were associated with untreated water in a natural setting. Examples include: cercarial dermatitis from a

freshwater pond**;** cryptosporidiosis from a lake; or norovirus infection from a swimming beach. A chemical exposure, such as contact with an algaecide on a freshwater pond, would also be included in this category. If an outbreak involved both treated and untreated recreational venues, select the "Type of Water Exposure" that reflects the venue with the most compelling epidemiological and environmental evidence linking it to the waterborne disease outbreak or illness. If it is unclear which type of recreational water exposure to select, choose the type that reflects the first exposure experienced by the first reported case.

- **Drinking water in public or individual water systems** – Select this type of exposure if the illnesses were associated with drinking water from a distribution system or bottled water. This includes showering and bathing exposures where the water source is part of a drinking water distribution system. For example, some non–recreational legionellosis outbreaks fall into this category. This type of exposure excludes water that is not part of a water distribution system (e.g., water from a stream by a hiking trail) regardless of whether or not the water was treated by an individual prior to being consumed.
- **Other water** – Select this type of exposure if the illnesses were associated with water from a source other than a recreational venue or drinking water system. This type of water includes—but is not limited to—water used in cooling towers, industrial processes, agricultural processes, occupational settings, decorative or display settings (e.g., decorative fountains), and water consumed from sources such as back–country streams.
- **Unknown water uses** – Select this type of exposure if the illnesses could not be associated with a single type of water exposure. This category is most commonly used for legionellosis outbreaks in which multiple water exposures may have been suspected (e.g., both cooling tower and drinking water system suspected, but neither was confirmed) or confirmed water exposures (e.g., both spa and drinking water system were implicated) in the epidemiologic and environmental investigation.

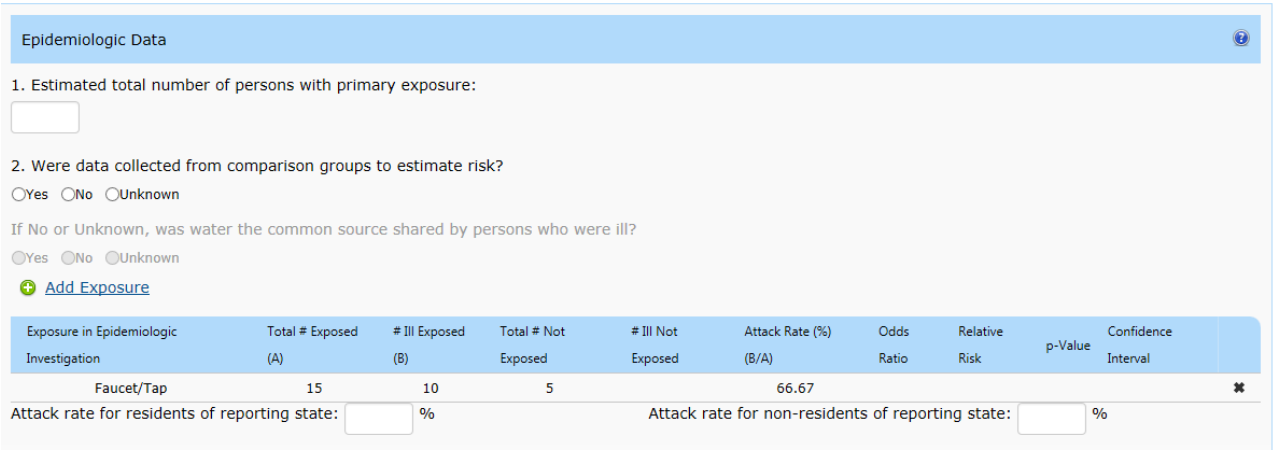
## 3.2. Epidemiologic Data Tab

In the Epidemiologic Data tab, epidemiologic information for the outbreak investigation is collected in four different sections: the Epidemiologic Data section, the Geographic Location section, the Route of Entry section, and the Associated Events section.




### 3.2.1. Epidemiologic Data Section

The Epidemiologic Data section includes two questions, a data table, and fields for information about attack rates.




1. **Estimated total number of persons with primary exposure** – Enter the estimated number of people with the primary exposure, regardless of whether they became ill or not. Note: The actual total number of persons with primary exposure is preferred if the information is available.

2. **Were data collected from comparison groups to estimate risk?** – Select the "Yes" radio button if an epidemiologic study (e.g., case–control, cohort, cross sectional) was conducted to calculate an odds ratio or relative risk for one or more exposures. If "No" or "Unknown" are selected, answer the follow–up question.

    - **If No or Unknown, was water the common source shared by persons who were ill? –** Select '"Yes" if an investigation indicated that there were no other common exposures (e.g., food) that could account for the illnesses. If it is suspected that water is the common source but there is no supporting evidence, check unknown.

**Epidemiologic Data Table:**

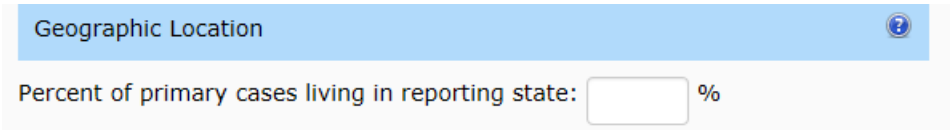
The Epidemiologic Data Table collects information from epidemiologic investigations. The fields in the table represent a column in which data can be entered. The "Attack Rate (%) (B/A)" field will be automatically calculated in NORS using the numbers entered for "Total # Exposed (A)" field and "# Ill Exposed (B)" field. Additional findings (e.g., a local or state outbreak investigation report) may also be attached the outbreak report.

- **Exposure in Epidemiologic Investigation** – This field is used to describe the type of exposure, vehicle or variable that was evaluated by the epidemiological investigation. Examples of the "Exposure in Epidemiologic Investigation" include: "Cooling Tower", "Drinking Water Dispenser/Container", and specific pool environments, such as "Pool – Water Slide". Refer to the NORS Waterborne Disease Reporting -Water List Values for a list of common exposures. Select the exposure that best describes the water venue or enter a new exposure value if needed.
- **Total # Exposed (A)** – This is the total number of people in the study who were exposed.
- **# Ill Exposed (B)** – This is the number of people who were exposed and became ill, according to the case definition for the study.
- **Total # Not Exposed**– This is the total number of people in the study who were not exposed.
- **# Ill Not Exposed** – This is the total number of people in the study who were not exposed but became ill, according to the case definition for the study.
- **Attack Rate (%) (B/A)** – The attack rate is the proportion of exposed persons who became ill out of the total number of people exposed. If numbers are entered into Total # Exposed (A) and # Ill Exposed (B), the Attack Rate (B/A) will be calculated automatically when the data are entered into NORS.
- **Odds Ratio** – The odds ratio (OR) is commonly reported for a case–control study. This value describes the odds of exposure in cases relative to the odds of exposure in controls.

- **Relative Risk** – The relative risk (RR) is a measure that is more commonly reported for cohort studies. This measure describes the risk of disease in exposed persons relative to the risk of disease in unexposed persons.
- **p–Value** – Please enter the exact p–Value that was calculated. Entries such as "<0.001" cannot be entered into the electronic system, but numeric values such as "0.001" can be entered into the electronic system. The p–Value can be used to evaluate the statistical significance of ORs and RRs.
    - The p–Value is the probability of observing a result as extreme or more extreme than the one observed, under the assumption that the null hypothesis (determined by the investigator) is true.
    - In a more general sense, the p–Value is the probability that the observed differences in a particular comparison, such as exposure to a suspected spa among ill people versus exposure to the same spa among healthy people, could have happened by chance alone, assuming that the group of people that became ill and the group of people that remained healthy were the same in all other ways.
    - CDC uses a p–Value of 0.05 to evaluate the statistical significance of waterborne disease outbreak analyses. For example, CDC would consider the epidemiological evidence for waterborne illness to be strong if the odds of developing *Pseudomonas*–related folliculitis were higher in people who used a spa at a recreational facility compared to the odds in people who attended the same facility but did not use the spa, and the p–Value was less than 0.05 (e.g., OR=1.8, p=0.008).
- **Confidence Interval** – A confidence interval (CI) can be used to provide a range for the true value of an OR or a RR and a level of confidence that the true value will be within that range. For example, when the upper and lower limits of a 95% CI are calculated for an OR, it is then possible for the investigator to state that he/she is 95% confident that the true OR will fall between those two numbers. A CI may also be used to evaluate the statistical significance in place of a p–Value—for example, if a 95% CI for an OR or a RR does not contain the number one, the ratio measure is considered significant at p=0.05.

- **Attack rate for residents of reporting state** – The attack rate is the proportion of exposed residents of the reporting state who became ill out of the total number of state residents exposed. Enter the attack rate that reflects the exposure most strongly associated with the outbreak.
- **Attack rate for non-residents of reporting state** – The attack rate is the proportion of exposed non–residents from other states who became ill out of the total number of non–residents exposed. If information is available about non–residents, enter the attack rate that reflects the exposure most strongly associated with the outbreak. The exposure used for the resident and non-resident attack rate fields should be the same.

### 3.2.2. Geographic Location Section

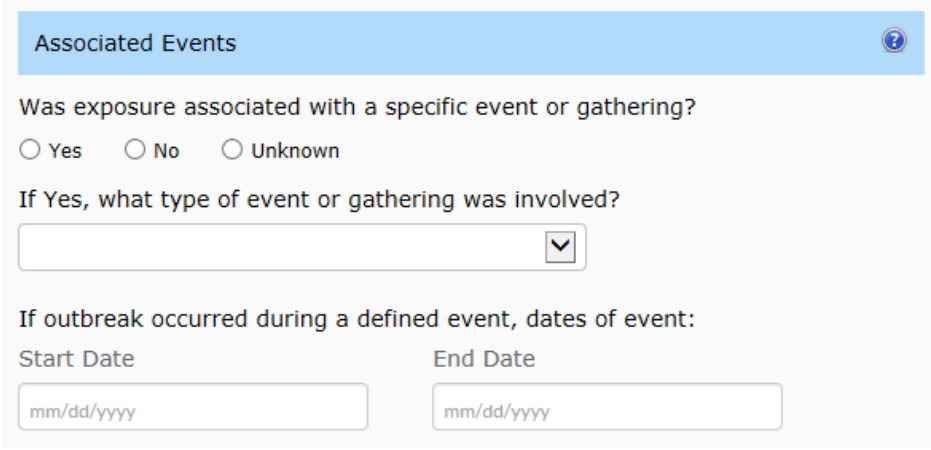



- **Percent of primary cases living in reporting state** – Complete this field to give more information about the number of outbreak–related primary cases among residents of the reporting state. This field is most relevant when reporting an outbreak with an exposure in a single state that involved cases from multiple states (e.g., water park) or an outbreak with an exposure that occurred in multiple states and involved cases from multiple states (e.g., commercially–bottled water).

### 3.2.3. Route of Entry Section


- **Route of Entry** – Select the route(s) of entry associated with this outbreak. Route of entry refers to the water exposure that resulted in illness. Responses should reflect known routes of entry, rather than suspected routes of entry.
  - **Ingestion**– Intentional and/or accidental ingestion of water.
  - **Contact**– Physical contact with water that does not involve ingestion or inhalation.
  - **Inhalation**– This may include inhalation of mist, steam, or larger water droplets.
  - **Other**– If a known route of entry is not already listed, select this value and specify in the remarks.
  - **Unknown**– Use this category if the route of entry is only suspected or cannot be determined. If an unlisted route of entry is only suspected, please select 'Unknown' and include a comment about the suspected route of entry in the Remarks section at the end of the outbreak report.

### 3.2.4. Associated Events Section



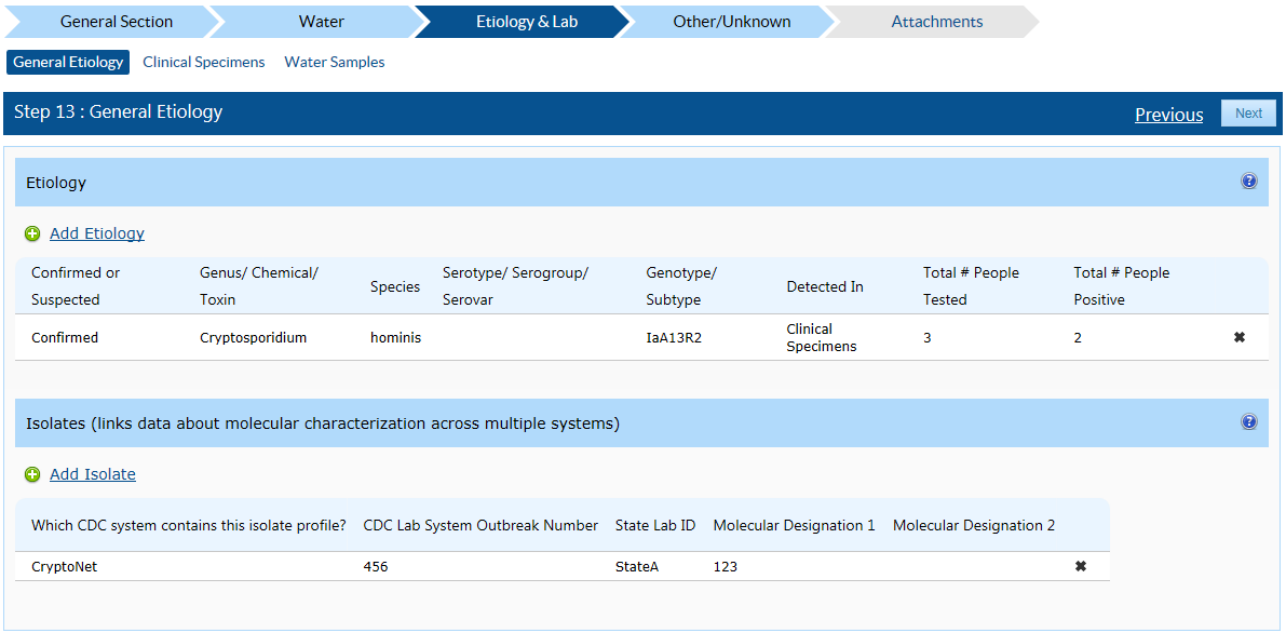
- **Was exposure associated with a specific event or gathering?** – Check "Yes" for this question if the majority of primary cases were exposed as a result of a specific event that they attended. An event has a defined start and end date or time (e.g., wedding reception, corporate retreat, picnic, pool party). Travel–related hotel/motel/lodge/inn stays are not counted as events; however specific events or gatherings (e.g., wedding reception, awards ceremony) in hotel/motel/lodge/inn settings are counted as events.
- **If Yes, what type of event or gathering was involved?** – If the answer to the previous question was "Yes", select the type of event or gathering in the drop down list. Refer to the NORS Waterborne Disease Reporting – Water List Values for a list of commonly reported events. If the event or gathering is not listed, please values may be added to the list in NORS by contacting NORSWater@cdc.gov.
- **If outbreak occurred during a defined event, dates of event**
    - **Start date** – This date reflects the first scheduled day of the event. If more than one event was involved, enter the first scheduled day of the earliest–occurring event.
    - **End date** – This date reflects the last scheduled day of the event.

# 4. WATER – ETIOLOGY & LAB SECTION

The Etiology & Lab section collects information about any pathogens, including chemicals and toxins that were implicated in the outbreak investigation, any clinical specimens collected or tested, and any water samples collected or tested. This section is organized into three tabs: the General Etiology tab, the Clinical Specimens tab, and the Water Samples tab.

## 4.1 General Etiology Tab

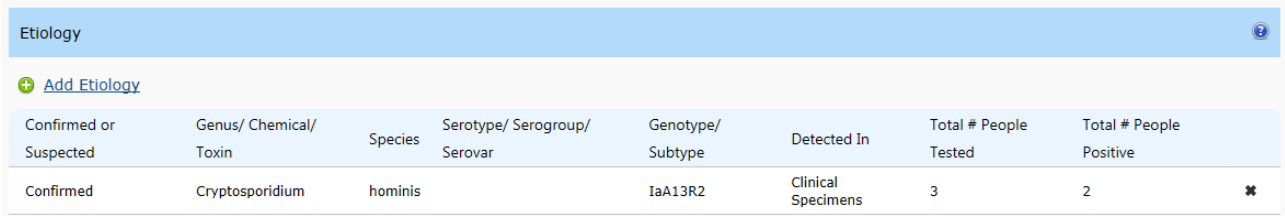
The General Etiology tab collects information about the suspected or confirmed etiology of an outbreak (i.e., the pathogen that caused the outbreak) and any clinical specimen or water sample testing related to the outbreak investigation. The General Etiology tab has two sections to collect this information: the Etiology section and the Isolates section.




### 4.1.1. Etiology Section

The Etiology section collects information about any suspected or laboratory confirmed pathogen, chemical, or toxin in a table. Note: this section pertains **only to primary cases**. Do not enter any information concerning secondary cases. Both suspected and confirmed etiologies may be reported in this section. If the etiology is unknown or has no laboratory confirmation please report the etiology as "Confirmed" and "Unknown" instead of leaving this table blank.

Refer to laboratory data and the final outbreak findings for information about the etiology of the outbreak.


Etiology

Add Etiology

| Confirmed or Suspected | Genus/ Chemical/ Toxin | Species | Serotype/ Serogroup/ Serovar | Genotype/ Subtype | Detected In | Total # People Tested | Total # People Positive | |
|---|---|---|---|---|---|---|---|---|
| Confirmed | Cryptosporidium | hominis | | IaA13R2 | Clinical Specimens | 3 | 2 | ✖ |

- **Confirmed or Suspected** – Select "Confirmed" if the etiology has been laboratory confirmed as the causative agent of the outbreak. Select "Suspected" if the etiology is suspected as the causative agent of the outbreak.
- **Genus/Chemical/Toxin** – This field provides the broadest description of an outbreak etiology. Enter this information based on the laboratory report data. If no laboratory report data is available, please report the suspected pathogen or agent instead of leaving this field blank (e.g., Suspected – Norovirus). If the pathogen or agent is unknown, please select an unknown etiology (e.g., "Unknown", "Unknown – Bacteria", "Unknown – Virus") and report the "Unknown" etiology as "Confirmed".
- **Species**– This field is for known species of each genus of bacteria, parasite, or virus.
    - Note that there are six species categorizations for *Escherichia coli*: enteroaggregative, enterohemorrhagic, enterotoxigenic, enteropathogenic, enteroinvasive, and other. These categories provide information about the type and severity of the outbreak. The table below summarizes the main categories (adapted from www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/confirming_diagnosis.html). Not all laboratories are able to perform the analyses necessary to categorize *E. coli*. Most commonly, state laboratories will only provide information about enterohemorrhagic *E. coli* (e.g. *E. coli* O157:H7) versus all other types of *E. coli*. Please note that CDC may be able to provide these states with additional laboratory diagnostic testing of *E. coli*.

Table 1. Descriptions of the species categorizations for *Escherichia coli*.

| ***Escherichia coli* category** | **Incubation Period** | **Clinical Syndrome** | **Laboratory Confirmation** |
|---|---|---|---|
| **Enteroaggregative (EAEC)*** | Variable | Diarrhea, mild abdominal pain and fever. Blood and fecal leukocytes not common. | Isolation of organism of same enteroaggregative serotype from stool of two or more ill persons. EAEC is defined by its pattern of adherence to HEp-2 cells in culture |
| **Enterohemorrhagic /Shiga-toxin-producing (*E. coli* O157:H7 and others)** | 1-10 days; usually 3-4 days | Diarrhea (often bloody), abdominal cramps (often severe), little or no fever | Isolation of *E. coli* O157:H7 or other Shiga-like toxin-producing *E. coli* from clinical specimen from two or more ill persons |
| **Enterotoxigenic (ETEC)** | 6-48 hrs Variable | Diarrhea, abdominal cramps, nausea; vomiting and fever less common Diarrhea, mild abdominal pain and fever. Blood and fecal leukocytes not common. | Isolation of organism of same serotype, demonstrated to produce heat-stable (ST) and/or heat-labile (LT) enterotoxin, from stool of two or more ill persons |
| **Enteropathogenic (EPEC)** | Variable | Diarrhea, fever, abdominal cramps | Isolation of organism of same enteropathogenic serotype from stool of two or more ill persons |
| **Enteroinvasive (EIEC)** | Variable | Diarrhea (might be bloody), fever, abdominal cramps | Isolation of same enteroinvasive serotype from stool of two or more ill persons |
| **Other** | Other – may vary | Other – may vary | Other – may vary |

9th Edition of the Manual of Clinical Microbiology, 2007, American Society for Microbiology, Washington, DC/editor in chief, PR Murray; editors EJ Baron, JH Jorgensen, ML Landry, and MA Pfaller.

- **Serotype/Serogroup/Serovar** – A serotype, serogroup, or serovar refers to a subtype that is determined by conducting molecular testing on surface antigens of the microorganism (e.g., *Legionella pneumophila* s1). This approach to subtyping is more common for bacteria, fungi, and viruses than parasites. This information may be available on the laboratory report. If testing is not available at the state laboratory, CDC may be able to provide laboratory testing assistance.

  Note: If the pathogen is norovirus, this section will be replaced with fields for polymerase and capsid information during data entry.

- **Polymerase**—If norovirus is selected as a suspected or confirmed etiology, select the polymerase type, if known. The combined norovirus polymerase and capsid types will be displayed in the Serotype field.

- **Capsid—**If norovirus is selected as a suspected or confirmed etiology, select the capsid type, if known. If no norovirus genotyping data is available, please select "unknown" for the capsid type. The combined norovirus polymerase and

capsid types will be displayed in the Serotype field.

- **Genotype/Subtype** – The genotype/subtype refers to a subtype that is determined by conducting molecular testing to describe the genetic composition of the microorganism. These methods are primarily used for subtyping parasites such as *Cryptosporidium* spp. This information may be available on the laboratory report. If testing is not available at the state laboratory, CDC may be able to provide laboratory testing assistance.

- **Detected in** – Detected in refers to the type of sample a pathogen or agent was identified.

- **Total # people tested** – This is the total number of primary cases who were tested for the pathogen or agent. Testing can include clinical specimens collected from the primary cases. If applicable, report the number of primary cases who were tested for the pathogen or agent.

- **Total # people positive** – This is the total number of primary cases who tested positive for the pathogen or agent. If applicable, report the number of primary cases who tested positive for the pathogen or agent.

**Etiology data from CaliciNet**

CaliciNet is a surveillance program that collects information on outbreak-associated norovirus strains. CDC routinely runs an algorithm to match CaliciNet records with NORS records. If data from CaliciNet have been matched to the NORS record, an additional Etiology table will appear below the NORS Etiology table. The table will contain CaliciNet data formatted to match the NORS Etiology table. The data in the CaliciNet Etiology table cannot be edited or deleted. If there is an error in the CaliciNet Etiology data, please contact NORSAdmin@cdc.gov.

There are three options for including the CaliciNet Etiology information in the NORS record; these are listed on the top of the CaliciNet Etiology table:

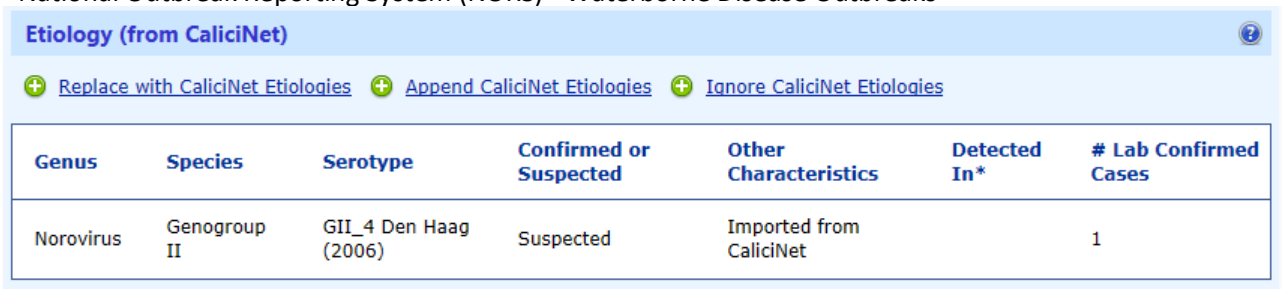
- *Replace with CaliciNet Etiologies* – Clicking this option will replace the data in the NORS Etiology table with the data shown in the CaliciNet Etiology table.

- *Append CaliciNet Etiologies* – Clicking this option will add the CaliciNet Etiology data to the NORS Etiology table without affecting the data currently in the NORS Etiology table.

- *Ignore CaliciNet Etiologies* – Clicking this option will hide the CaliciNet Etiology table. No data will be added to or changed in the NORS Etiology table.

Once you have clicked one of the above options, the CaliciNet Etiology table will be hidden, and the statement "Etiology data from CaliciNet has been added or ignored. Show CaliciNet Etiologies" will appear. Click the "Show CaliciNet Etiologies" link to view the CaliciNet Etiology table again.

For more information regarding the CaliciNet Integration, please refer to the CaliciNet Integration training document on the NORS website at www.cdc.gov/nors/training/general.html.



**Etiology (from CaliciNet)**

Replace with CaliciNet Etiologies | Append CaliciNet Etiologies | Ignore CaliciNet Etiologies

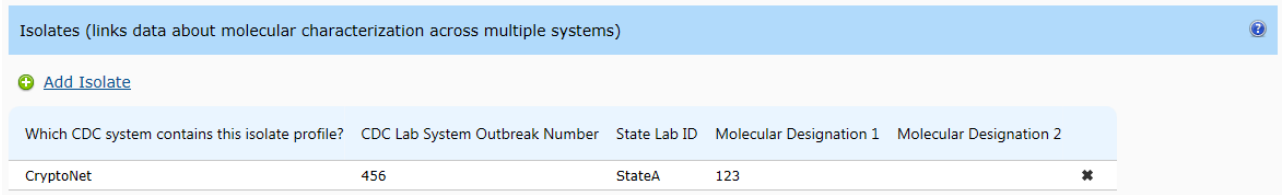
| Genus | Species | Serotype | Confirmed or Suspected | Other Characteristics | Detected In* | # Lab Confirmed Cases |
|---|---|---|---|---|---|---|
| Norovirus | Genogroup II | GII_4 Den Haag (2006) | Suspected | Imported from CaliciNet | | 1 |

### 4.1.2. Isolates Section

The Isolates section captures additional information about the molecular patterns of pathogens found in specimens. If laboratory data or the final outbreak report provides data about a DNA pattern (aka a "fingerprint") for a pathogen that was determined using a molecular testing methods (e.g., pulse field gel electrophoresis–PFGE or single gene or whole genome sequencing), the laboratory isolate ID number and the molecular designation (e.g., PFGE pattern name or molecular subtype) can be entered into this table. To learn more about current uses of molecular testing for outbreak investigations, refer to the following websites:

- PulseNet (www.cdc.gov/pulsenet) is a foodborne disease surveillance program that includes a searchable database of PFGE patterns.
- CaliciNet (www.cdc.gov/norovirus/reporting/caliciNet/) is a norovirus outbreak surveillance program that collects information on strains of norovirus associated with gastroenteritis outbreaks.
- CryptoNet (www.cdc.gov/parasites/crypto/cryptonet) is a molecular tracking system for *Cryptosporidium* isolates.

Molecular data will improve waterborne disease surveillance by supporting efforts to identify pathogens associated with waterborne disease outbreaks. For example, if several cases of cryptosporidiosis lived in different states but visited the same water park, matching molecular subtypes could provide evidence of a waterborne disease outbreak that might otherwise be missed.



Isolates (links data about molecular characterization across multiple systems)

Add Isolate

| Which CDC system contains this isolate profile? | CDC Lab System Outbreak Number | State Lab ID | Molecular Designation 1 | Molecular Designation 2 | |
|---|---|---|---|---|---|
| CryptoNet | 456 | StateA | 123 | | ✖ |

**Isolates Table:**

- **Which CDC system contains this isolate profile?** – Identify the CDC system (e.g., PulseNet, CaliciNet, CryptoNet) that shares the same isolate profile or has detailed laboratory information for the isolate implicated in the outbreak investigation.
- **CDC Lab System Outbreak Number** – If a CDC laboratory system contains isolate profile information for a pathogen related to this NORS report, indicate the lab system outbreak identifier in the other CDC system.
- **State Lab ID** –Report the state lab identifier that relates to the isolate profile.
- **Molecular Designation 1** – Identify the molecular designation of the isolate.
- **Molecular Designation 2** –If another molecular designation is available under the same state lab ID, identify the molecular designation of the isolate.

**Isolate data from CaliciNet**

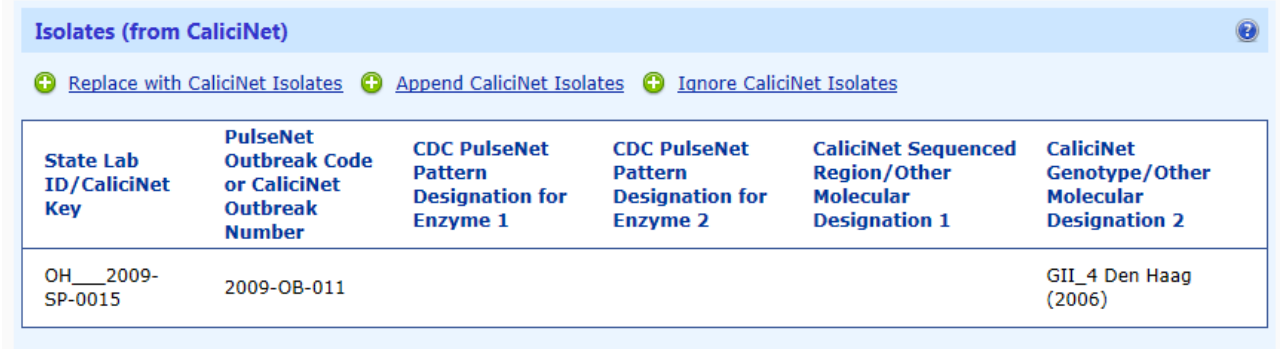
CaliciNet is as surveillance program that collects information on outbreak-associated norovirus strains. CDC routinely runs an algorithm to match CaliciNet records with NORS records. If data from CaliciNet have been matched to the NORS record, an additional Isolates table will appear below the NORS Isolates table. The table will contain CaliciNet data formatted to match the NORS Isolates table. The data in the CaliciNet Isolates table cannot be edited or deleted. If there is an error in the CaliciNet Isolates data, please contact NORSAdmin@cdc.gov.

There are three options for including the CaliciNet Isolate information in the NORS record; these are listed on the top of the CaliciNet Isolates table:

- *Replace with CaliciNet Isolates* – Clicking this option will replace the data in the NORS Isolates table with the data shown in the CaliciNet Isolates table.
- *Append CaliciNet Isolates* – Clicking this option will add the CaliciNet Isolates data to the NORS Isolates table without affecting the data currently in the NORS Isolates table.
- *Ignore CaliciNet Isolates* – Clicking this option will hide the CaliciNet Isolates table. No data will be added to or changed in the NORS Isolates table.

Once you have clicked one of the above options, the CaliciNet Isolates table will be hidden, and the statement "Isolate data from CaliciNet has been added or ignored. Show CaliciNet Isolates" will appear. Click the "Show CaliciNet Isolates" link to view the CaliciNet Isolates table again.

For more information regarding the CaliciNet Integration, please refer to the CaliciNet Integration training document on the NORS website at https://www.cdc.gov/nors/training/general.html.



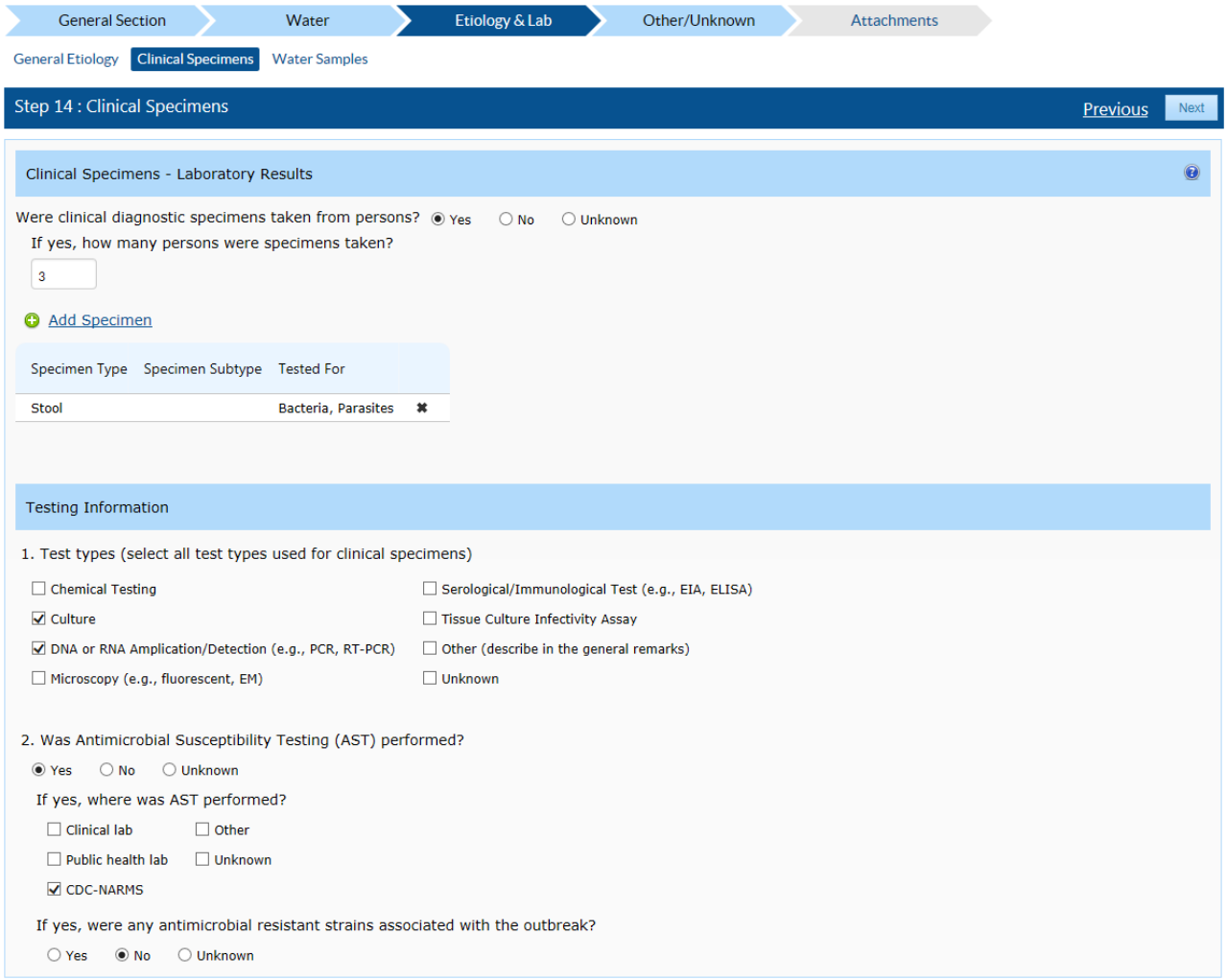
**Isolates (from CaliciNet)**

Replace with CaliciNet Isolates | Append CaliciNet Isolates | Ignore CaliciNet Isolates

| State Lab ID/CaliciNet Key | PulseNet Outbreak Code or CaliciNet Outbreak Number | CDC PulseNet Pattern Designation for Enzyme 1 | CDC PulseNet Pattern Designation for Enzyme 2 | CaliciNet Sequenced Region/Other Molecular Designation 1 | CaliciNet Genotype/Other Molecular Designation 2 |
|---|---|---|---|---|---|
| OH___2009-SP-0015 | 2009-OB-011 | | | | GII_4 Den Haag (2006) |

## 4.2. Clinical Specimens Tab

The Clinical Specimens tab collects information about any clinical specimens that were collected and tested in a table and the types of tests performed. There are two sections in the Clinical Specimens tab: the Clinical Specimens – Laboratory Results section and the Test Types section.

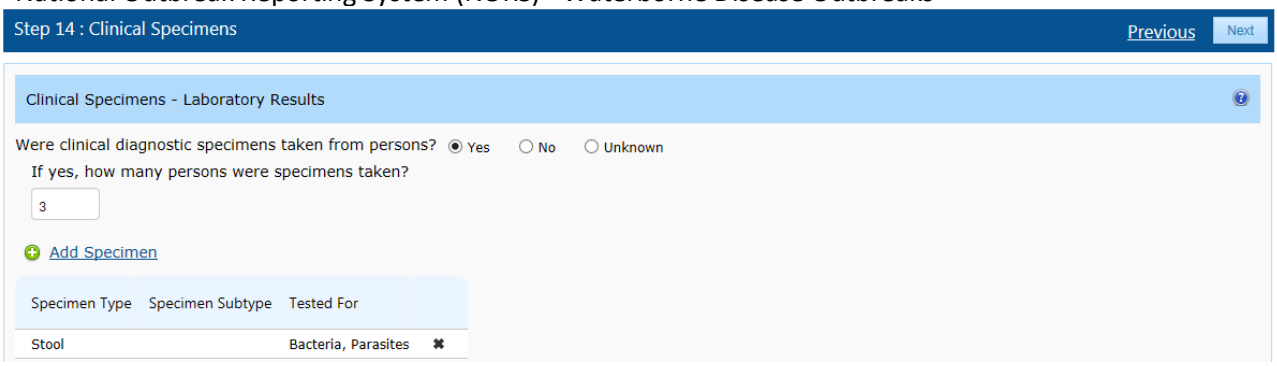



### 4.2.1. Clinical Specimens – Laboratory Results Section

The Clinical Specimens section captures information about any clinical specimens that were collected and/or tested. If a specimen type was tested for multiple categories of disease agents (e.g., parasites and bacteria), select all that apply.

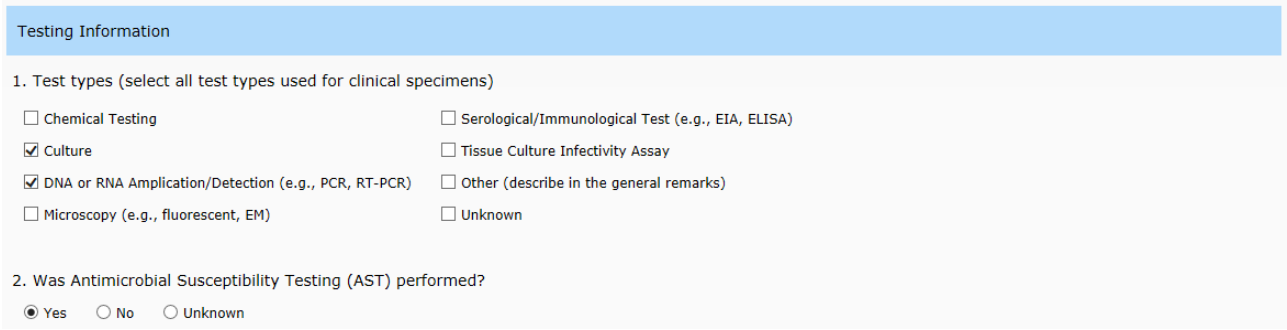
Data in this section help to describe the etiology of the outbreak. If clinical diagnostic specimens (e.g. stool samples, blood samples, urine samples) were collected during the outbreak, please answer “Yes” to the first question one and enter the number of persons who provided samples. (Note--the number of specimens collected for testing may be greater than the number of persons who submitted samples).

Some outbreaks might have multiple etiologies. CDC considers a pathogen to be responsible for an outbreak if ≥ 5% of all the positive clinical specimens test positive for the pathogen.




- **Were clinical diagnostic specimens taken from persons?** – Check "Yes" if clinical specimens were collected from a person.
- **If yes, from how many persons were specimens taken?** – If specimens were collected, indicate the number of persons from whom they were collected.
- **Clinical Specimens Table:**
- **Specimen Type** – Identify the specimen type collected (e.g., Blood, Biopsy, Saliva).
- **Specimen Subtype** – If the Specimen Type is "Autopsy" or "Biopsy", identify the Specimen Subtype collected (e.g., Liver, Skin, Wound).
- **Tested for** – Indicate the broad category of what the clinical specimen was tested for (e.g., bacteria, chemicals/toxins, viruses).

### 4.2.2. Testing Information Section

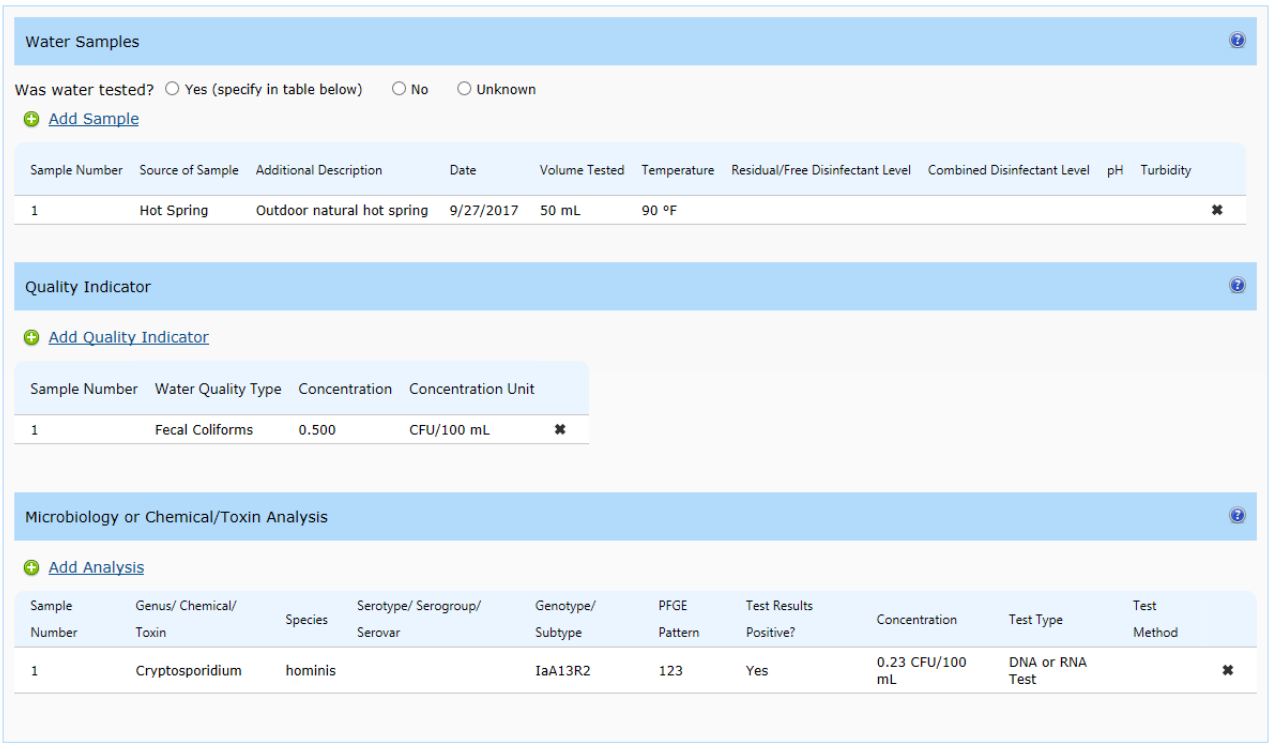



- **Test Types** – Indicate the method of testing used to identify the pathogen or agent in the clinical specimen(s). If multiple testing methods were performed, select all of the method(s) that apply.

- **Was antimicrobial susceptibility testing (AST) performed?** — Indicate whether any specimens were tested for antimicrobial resistance.
    - **If yes, where was AST performed?** — Indicate whether the AST was done by a clinical lab (e.g., hospital), a public health lab, the National Antimicrobial Resistance Monitoring System (NARMS), another lab, or unknown. Select all that apply.
    - **If yes, were any antimicrobial resistant isolates associated with the outbreak?** — Indicate whether any resistant isolates were detected.

## 4.3. Water Samples Tab

The Water Samples tab collects information about water samples that were collected during the outbreak investigation. These data provide evidence regarding water quality, as well as the presence of specific pathogens, chemicals or toxins in the water associated with the outbreak. Multiple water samples can be reported. Information in the Water Samples Tab is collected in three sections: the Water Samples section, the Quality Indicator section, and the Microbiology or Chemical/Toxin Analysis section.



Water Samples

Was water tested? ○ Yes (specify in table below) ○ No ○ Unknown

Add Sample

| Sample Number | Source of Sample | Additional Description | Date | Volume Tested | Temperature | Residual/Free Disinfectant Level | Combined Disinfectant Level | pH | Turbidity | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Hot Spring | Outdoor natural hot spring | 9/27/2017 | 50 mL | 90 °F | | | | | ✖ |

Quality Indicator

Add Quality Indicator

| Sample Number | Water Quality Type | Concentration | Concentration Unit | |
|---|---|---|---|---|
| 1 | Fecal Coliforms | 0.500 | CFU/100 mL | ✖ |

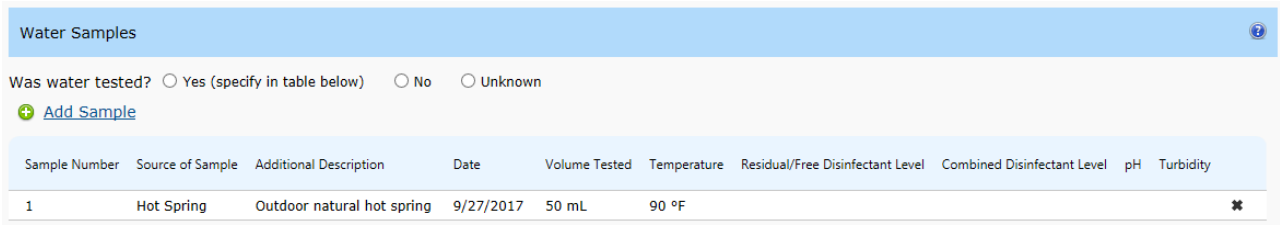
Microbiology or Chemical/Toxin Analysis

Add Analysis

| Sample Number | Genus/ Chemical/ Toxin | Species | Serotype/ Serogroup/ Serovar | Genotype/ Subtype | PFGE Pattern | Test Results Positive? | Concentration | Test Type | Test Method | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Cryptosporidium | hominis | | IaA13R2 | 123 | Yes | 0.23 CFU/100 mL | DNA or RNA Test | | ✖ |

### 4.3.1. Water Samples Section

The Water Samples section collects information about water samples that were collected or tested in the outbreak investigation. At least one water sample must be reported to fill out the subsequent Quality Indicator section and the Microbiology or Chemical/Toxin Analysis section.




- **Was water tested? –** Indicate whether water samples were tested.
    - Select "Yes" if water samples were tested and specify the sample in the table.
    - Select "No" if water samples were not tested.
    - Select "Unknown" if it is unknown if water samples were tested.

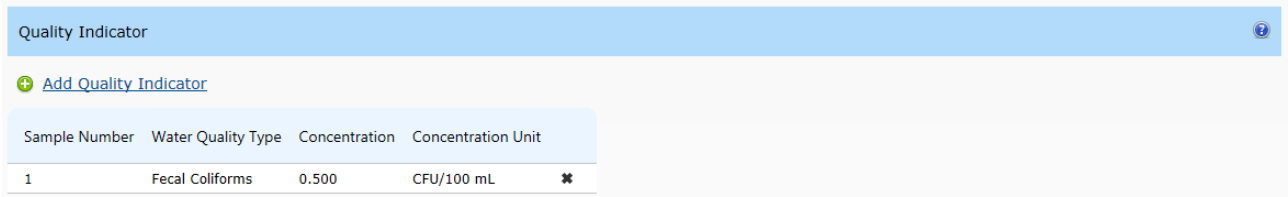
**Water Samples Table:**

- **Sample Number** – This number is automatically assigned and allows you to relate your water sample with results in the following Water Quality Indicator and Microbiology or Chemical/Toxin tables.
- **Source of Sample** – Select the source of the water sample that was tested.
- **Additional Description**– Provide additional information that will help to explain the source of the sample. For example, one sample might be "lake– swim area" while another might be "lake– wading area"
- **Date** – This is the date that the sample was collected.
- **Volume Tested (Number, Unit)** – Complete this section if a specific amount of water was collected for testing.
- **Temperature (Number, Unit)** – Complete this section if a temperature was recorded for the water sample.
- **Residual/Free Disinfectant Level (Number, Unit)** – Complete this section if a residual or free disinfectant level was measured for the water sample. This field refers to the level of disinfectant that has not reacted with other compounds in the water and is still available to effectively inactivate microorganisms in the Water. If only the total disinfectant level and the combined disinfectant level are known: (Residual or Free) = Total – Combined.

- **Combined Disinfectant Level** – Complete this section if a combined disinfectant level was measured the water sample. This field refers to the level of disinfectant that has combined with organic compounds in the water and is no longer available to work as an effective disinfectant (e.g., chloramines). If only the total disinfectant level and the residual/free disinfectant level are known: Combined Disinfectant = Total – (Residual or Free).
- **pH** – Indicate the pH of the water sample.
- **Turbidity (NTU)** – Complete this field if turbidity was measured for the water sample. Turbidity describes the amount of suspended matter in the sample.

### 4.3.2. Quality Indicator Section

The Quality Indicator section collects information about quality indicators for water samples reported in the Water Samples section. Water quality data may be helpful when an investigator is trying to determine the source of an outbreak. For example, if a laboratory did not find *Giardia* spp. in a water sample from an implicated lake, fecal coliform levels above EPA standards would provide environmental evidence to support the argument that the lake was the source of the outbreak. At least one water sample must be reported in the Water Samples Table to fill out the subsequent Quality Indicator Table. This section may not be applicable to treated recreational (Rec. Treated) water exposures.

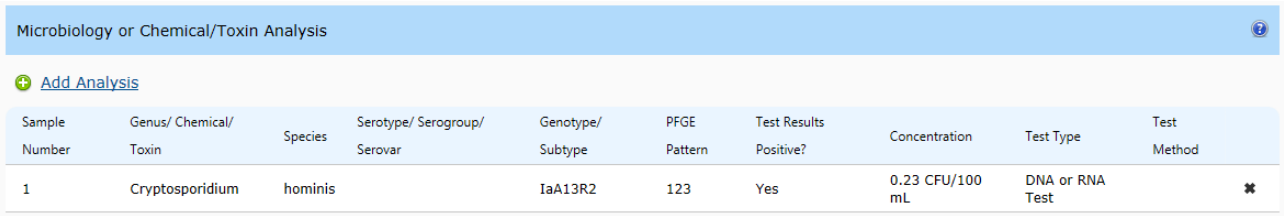



**Quality Indicator Table:**

- **Sample Number** – This field allows you to pick the sample number that corresponds with the appropriate sample from the Water Samples Table.
- **Type** – Select the type of water quality indicator for which the water was tested. If more than one water quality indicator was tested, enter a separate row for each line of data. Total coliforms and fecal coliforms are both examples of water quality indicators.
- **Concentration** – The concentration is a count of microorganisms or chemical particles. The units for the concentration are entered in the next field. For example, if 250 colony forming units (CFU) of fecal coliforms were measured, the concentration would be 250.
- **Unit** – The unit refers to the amount of the microorganism or chemical that was measured by the laboratory (e.g., oocysts/L; mg/L, parts per million [ppm], CFU, most probable number [MPN]).

### 4.3.3. Microbiology or Chemical/Toxin Analysis Results Section

The Microbiology or Chemical/Toxin Analysis Results section collects information about the pathogen, chemical, or agent detected. Refer to laboratory data and final outbreak findings for information to report in the Microbiology or Chemical/Toxin Analysis Table. Please report positive findings and negative findings (if a test for a specific pathogen returned null findings). Some of the information may be absent from the report, depending on the testing that was performed (e.g., although a species may have been identified, it may not have been genotyped).


Microbiology or Chemical/Toxin Analysis

Add Analysis

| Sample Number | Genus/ Chemical/ Toxin | Species | Serotype/ Serogroup/ Serovar | Genotype/ Subtype | PFGE Pattern | Test Results Positive? | Concentration | Test Type | Test Method | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Cryptosporidium | hominis | | IaA13R2 | 123 | Yes | 0.23 CFU/100 mL | DNA or RNA Test | | ✖ |

**Microbiology or Chemical/Toxin Analysis Table:**

- **Sample Number** – Enter the sample number that corresponds with the appropriate sample from the Water Samples Table.
- **Genus/Chemical/Toxin** – This field provides the broadest description of the pathogen or agent for which the sample tested negative or positive. Enter this information based on the laboratory report data.
- **Species** – This field is for known species of each genus of bacteria, parasite or virus.
    - Note that there are six species categorizations for *Escherichia coli*: enteroaggregative, enterohemorrhagic, enterotoxigenic, enteropathogenic, enteroinvasive, and other. These categories provide information about the type and severity of the outbreak. The table below summarizes the main categories (adapted from www.cdc.gov/foodsafety/outbreaks/investigating- outbreaks/ confirming_diagnosis.html). Not all laboratories are able to perform the analyses necessary to categorize *E. coli*. Most commonly, state laboratories will only provide information about enterohemorrhagic *E. coli* (e.g. *E. coli* O157:H7) versus all other types of *E. coli*. Please note that CDC may be able to provide these states with additional laboratory diagnostic testing of *E. coli*.

Table 2. Descriptions of the species categorizations for *Escherichia coli*.

| ***Escherichia coli* category** | **Laboratory Confirmation** |
|---|---|
| **Enteroaggregative (EAEC)*** | Isolation of organism of same enteroaggregative serotype from a water sample. EAEC is defined by its pattern of adherence to HEp-2 cells in culture |
| **Enterohemorrhagic/Shiga-toxin-producing (*E. coli* O157:H7 and others)** | Isolation of *E. coli* O157:H7 or other Shiga-like toxin-producing *E. coli* from a water sample |
| **Enterotoxigenic (ETEC)** | Isolation of organism of same serotype, demonstrated to produce heat-stable (ST) and/or heat-labile (LT) enterotoxin, from a water sample |
| **Enteropathogenic (EPEC)** | Isolation of organism of same enteropathogenic serotype from a water sample |
| **Enteroinvasive (EIEC)** | Isolation of same enteroinvasive serotype from a water sample |
| **Other** | Other – may vary |

9th Edition of the Manual of Clinical Microbiology, 2007, American Society for Microbiology, Washington, DC/editor in chief, PR Murray; editors EJ Baron, JH Jorgensen, ML Landry, and MA Pfaller.

**Serotype/Serogroup/Serovar** – A serotype, serogroup or serovar refers to a subtype that is determined by conducting molecular testing on surface antigens of the microorganism (e.g., *Legionella pneumophila* s1). This approach to subtyping is more common for bacteria, fungi and viruses than parasites. This information may be available on the laboratory report. If testing is not available at the state laboratory, CDC may be able to provide laboratory testing assistance. Matching serotypes/serogroups/serovars from water and biological samples provide stronger environmental evidence that the pathogens or agents responsible for the outbreak were transmitted through exposure to contaminated water.

Note: If the pathogen is norovirus, this section will be replaced with fields for polymerase and capsid information during data entry.

- **Polymerase**—If norovirus is selected as a suspected or confirmed etiology, select the polymerase type, if known. The combined norovirus polymerase and capsid types will be displayed in the Serotype field.

- **Capsid—**If norovirus is selected as a suspected or confirmed etiology, select the capsid type, if known. If no norovirus genotyping data is available, please select "unknown" for the capsid type. The combined norovirus polymerase and capsid types will be displayed in the Serotype field.

- **Genotype/Subtype** – The genotype/subtype refers to a subtype that is determined by conducting molecular testing to describe the genetic composition of the microorganism. These methods are primarily used for subtyping parasites such as *Cryptosporidium* spp. This information may be available on the laboratory report. If testing is not available at the state laboratory, CDC may be able to provide laboratory testing assistance. Matching genotypes/subtypes from water and biological samples provide stronger environmental evidence that the pathogens or agents responsible for the outbreak were

transmitted through exposure to contaminated water.

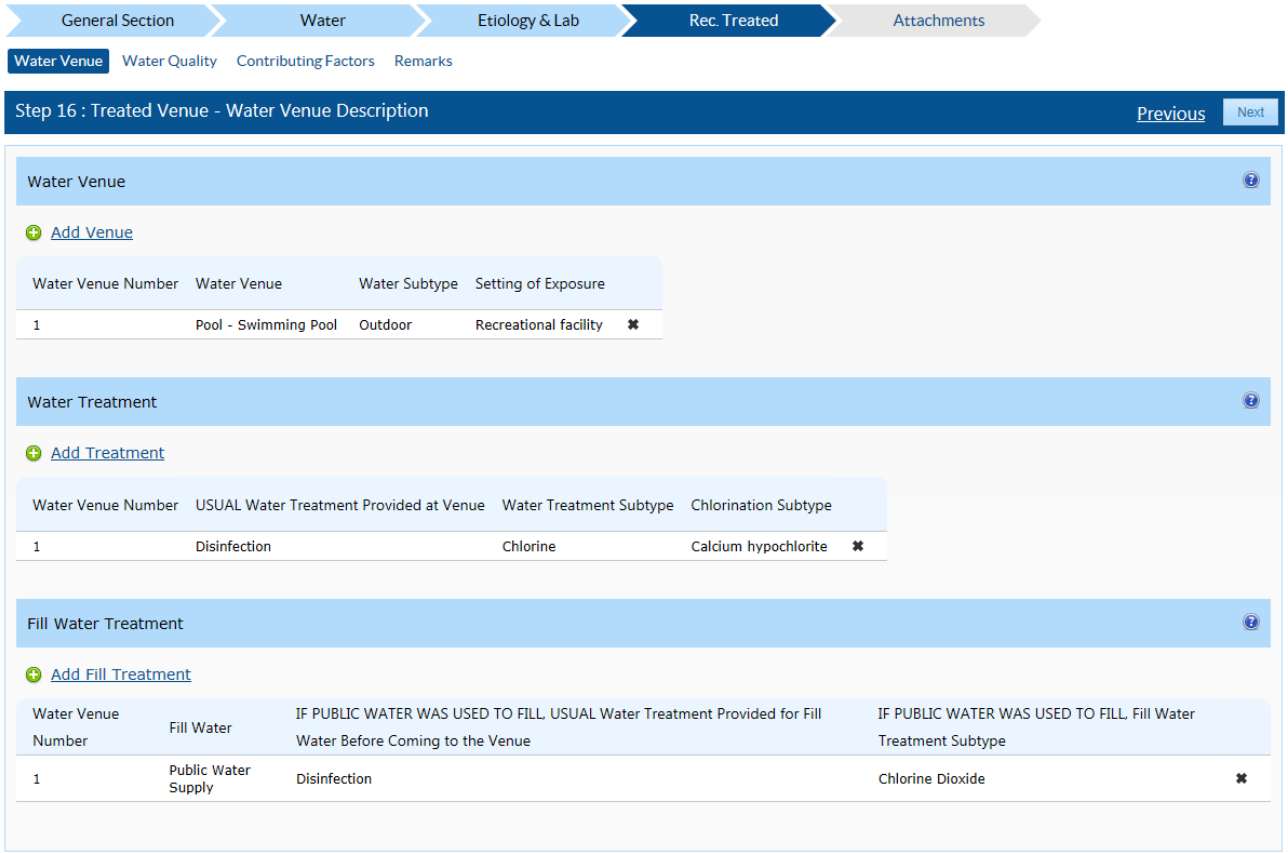
- **PFGE Pattern** – The PFGE pattern, or fingerprint, can be used to differentiate genetically similar pathogens. Matching PFGE patterns from water and biological samples are strong environmental evidence that the pathogens or agents responsible for the outbreak were transmitted through exposure to contaminated water.
- **Test Results Positive?** – Check "Yes" if the water sample tested positive for the pathogen or chemical/toxin.
- **Concentration** – The concentration is a count of microorganisms or chemical particles. The units for the concentration are entered in the next field. For example, if 25 oocysts/L of *Cryptosporidium hominis* were measured, the concentration would be 25. There will typically be a concentration for initial tests that have positive results, however, there may not always be a concentration for more complex tests that provide species or subtyping results.
- **Unit** – The unit refers to the amount of the microorganism or chemical that was measured by the laboratory (e.g., oocysts/L, mg/L, parts per million [ppm], colony forming units [CFU], most probable number [MPN]). As with concentration, there may not always be a unit to enter into this field.
- **Test Type** – This field describes the method of testing used to identify the microorganism. If multiple methods were used, select the method that provided the most detailed information (e.g., if a microorganism was found using microscopy and then genotyped using polymerase chain reaction (PCR), select "DNA or RNA Amplication/Detection" (e.g., PCR, RT–PCR).
- **Test Method** – This field provides information about the water testing methods that were used on the sample. Many of the method numbers refer to standard testing procedures or approved EPA methods. Refer to the NORS-Water List Values for a list of common method numbers for this field, which contain the following information: method source, official method number, and method summary description.
    - Refer to the National Environmental Methods Index (NEMI) at www.nemi.gov to compare and contrast methods for either microbiological testing or chemical testing.
    - For information about Clean Water Act (CWA) analytic methods, please visit www.epa.gov/cwa-methods.

# 5. RECREATIONAL TREATED WATER VENUE – REC. TREATED SECTION

The Rec. Treated section collects information about the type of recreational water venue, the water quality of the venue, and any contributing factors identified in the outbreak investigation.

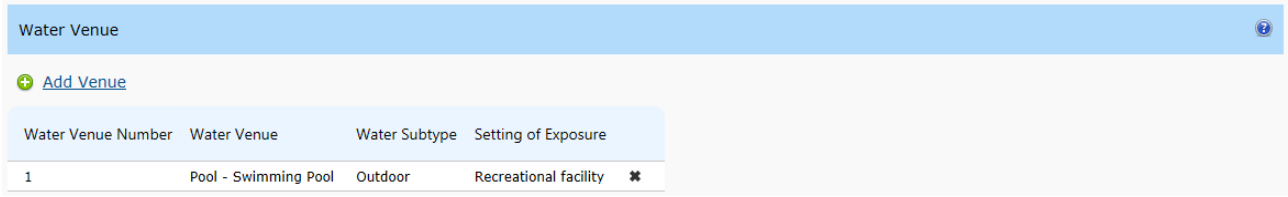
## 5.1. Water Venue Tab

The Water Venue tab collects descriptive information about the water venue, including water treatment, and fill water treatment for the venue. This section is organized into three related sections: the Water Venue section, the Water Treatment section, and the Fill Water Treatment section. At least one water venue must be reported in the Water Venue section to enter information into the subsequent Water Treatment and Fill Water Treatment sections.



### 5.1.1. Water Venue Section

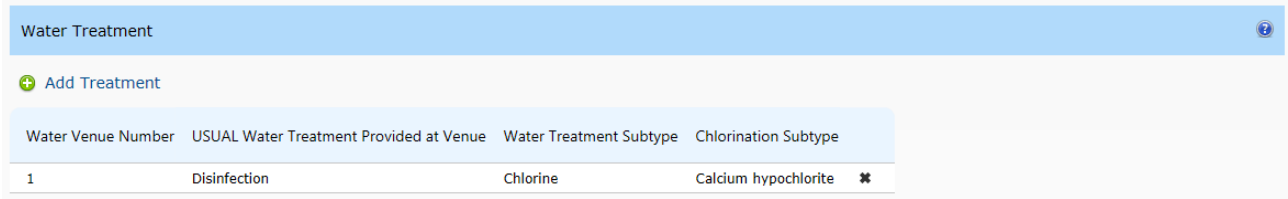
The Water Venue section collects information about water venues that may have been implicated in an outbreak investigation in a table. At least one water venue must be reported in the Water Venue table to fill out the subsequent Water Treatment section and the Fill Water Treatment section. Refer to the NORS Waterborne Disease Reporting – Water List Values document for picklist options.




**Water Venue Table:**

- **Water Venue Number** – This field is an automatically assigned number for each water venue reported in the Water Venue Table. The Water Venue Number is used to relate a Water Venue to the information in the subsequent Water Treatment and Fill Water Treatment tables.
- **Water Venue** – Water Venue refers to types of treated recreational water venues, such as a spa or pool. Note that some settings are combined, such as spa/whirlpool/hot tub. Also note that some water types have been divided into multiple categories with standardized names (e.g., pool—swimming pool, pool—waterpark). The water type is further detailed in the Water Subtype and Setting of Exposure fields.
- **Water Subtype** – Indicate the subtype of water (if applicable). The Water Subtype can specify if a Water Venue is indoors, outdoors or unknown.
- **Setting of Exposure** – This field allows you to report descriptors that explain where the exposure to water occurred. For example, this field allows you to differentiate between a swimming pool at a camp (e.g., “Camp/Cabin Setting”) and a swimming pool at a hotel (e.g., “Hotel/Motel/Lodge/Inn”). Note that some settings are combined, such as “Hotel/Motel/Lodge/Inn”.

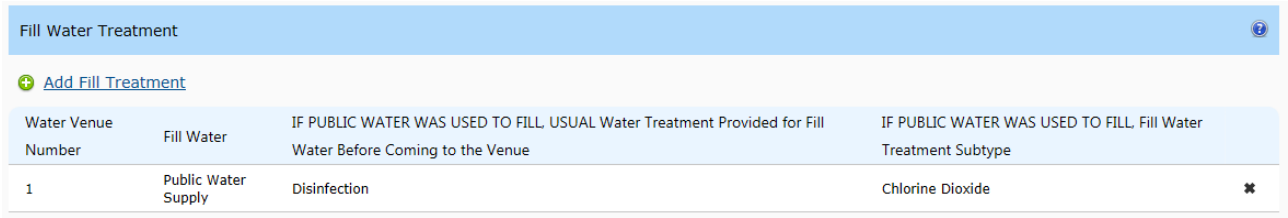
### 5.1.2. Water Treatment Section




**Water Treatment Table:**

- **Water Venue Number** – Use the Water Venue Number to relate water venues in the Water Venue Table to water treatment descriptions.
- **USUAL Water Treatment Provided at Venue** – This field allows you to enter information about the usual water treatments provided at the venue, regardless of whether or not these treatments were operating correctly at or just prior to the time of the outbreak.
- **Venue Treatment Subtype** – This field provides subtypes for disinfection and filtration treatments frequently used in treated recreational water venues.
- **Chlorination Subtype** – This field provides subtypes specifically for chlorination disinfection methods.

### 5.1.3. Fill Water Treatment Section




**Fill Water Treatment Table:**

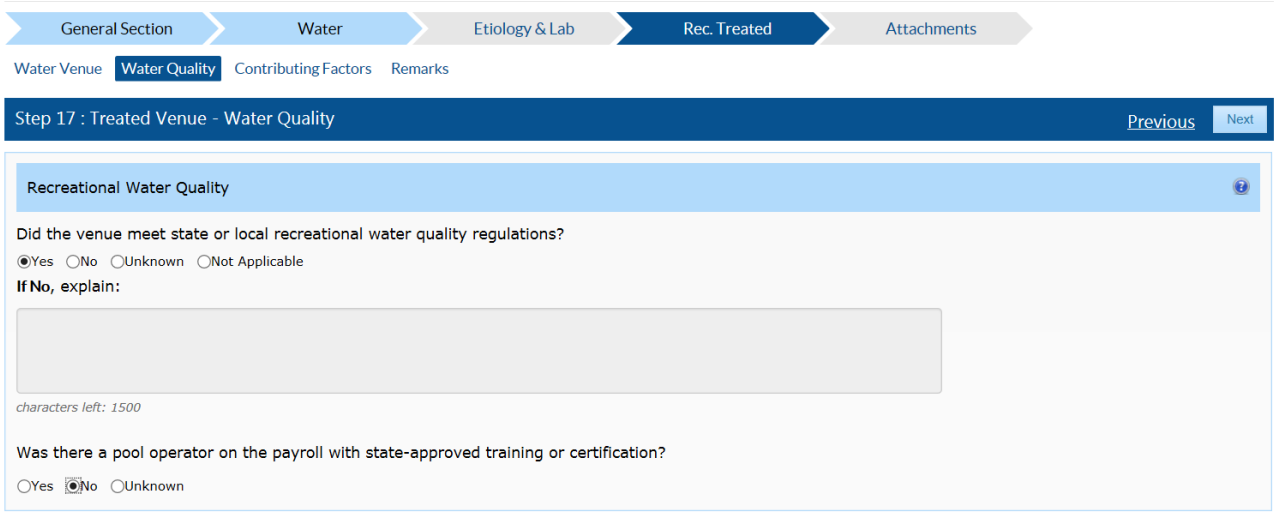
- **Water Venue Number** – Use the Water Venue Number to relate water venues in the Water Venue Table to fill water treatment descriptions.
- **Fill Water Type** – This field includes types of fill water frequently used in treated recreational water venues (e.g., the type of water used to fill up a swimming pool).
- **IF PUBLIC WATER WAS USED TO FILL, USUAL Water Treatment Provided for Fill Water Before Coming to the Venue** – If public water was selected as the fill water type, complete this field to give more information about water treatment provided before the water reached the venue (e.g., treatment prior to the water meter or property line).

Enter information about the usual water treatments, regardless of whether or not these treatments were operating correctly at or just prior to the time of the outbreak.

- **IF PUBLIC WATER WAS USED TO FILL, Fill Water Treatment Subtype** – If public water was selected as the fill water type and either disinfection or filtration was selected as the usual water treatment type, complete this field to give more information about the disinfection or filtration method used to treat the water before it arrived

## 5.2. Water Quality Tab

The Water Quality tab collects water quality information about the recreational treated water venue implicated in the outbreak investigation.



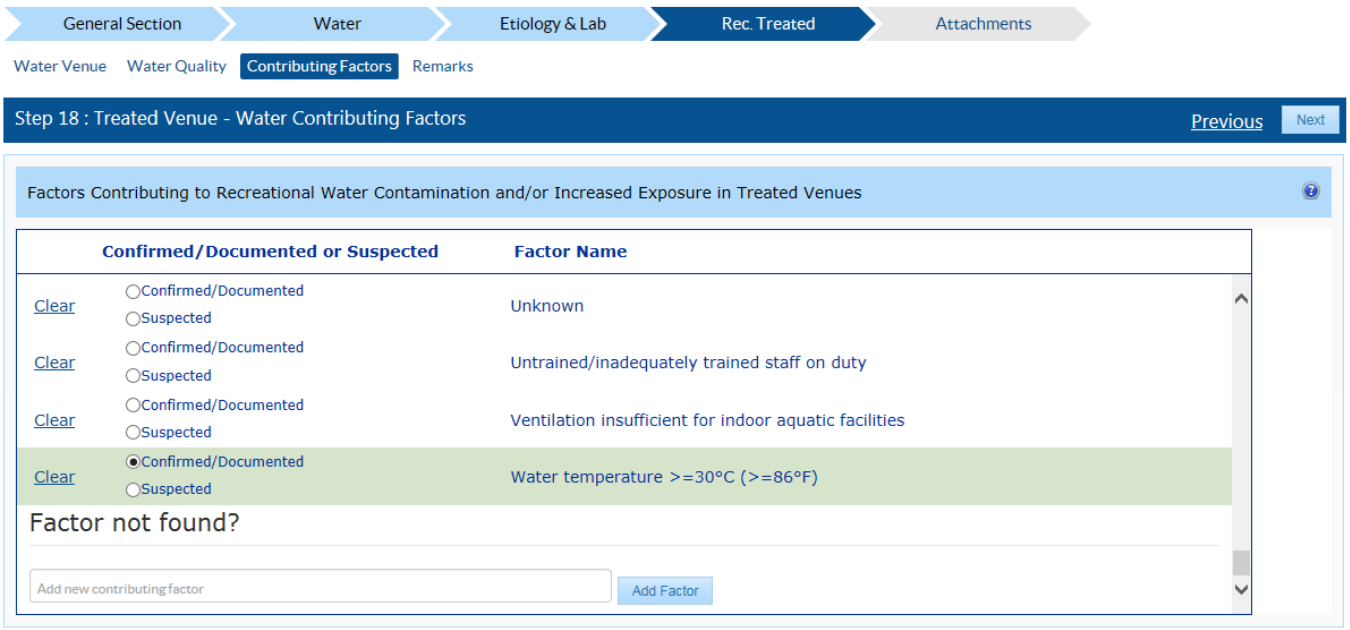

- **Did the venue meet state or local recreational water quality regulations?-** Respond using to the water quality regulations for the state or local jurisdiction (e.g., county) where the water exposure that was associated with the outbreak occurred.
    - Answer "Yes" if the outbreak involved one or more venues (e.g., a commercial water park and a community swimming pool) in one or more jurisdictions and the response would be "Yes" for all of the venues according to the regulations for the state where the exposure occurred.
    - Answer "No" if the outbreak involved one or more venues (e.g., a commercial water park and a community swimming pool) in one or more jurisdictions and the response would be "No" for even one of the venues according to the regulations for the state where the exposure occurred. Provide an explanation in the text box if "No" is selected.
    - Answer "Unknown" if the response would be "Unknown" for one or more venues where the exposure occurred.

- Answer "Not Applicable" if none of the exposures occurred at venues in the reporting

- **Was there a pool operator on the pay roll with state–approved training or certification?** – Respond with reference to the venue(s) implicated in the outbreak investigation.
  - Answer "Yes" if the outbreak involved one or more venues (e.g., a commercial water park and a community swimming pool) in one or more jurisdictions and the response would be "Yes" for all of the venues with reference to the training or certification standards for the state where the exposure occurred.
  - Answer "No" if the outbreak involved one or more venues (e.g., a commercial water park and a community swimming pool) in one or more jurisdictions and the response would be "No" for even one of the venues with reference to the training or certification standards for the state where the exposure occurred.
  - Answer "Unknown" if you are responding about one or more venues in another state or if the outbreak involved one or more venues.

## 5.3. Contributing Factors Tab

The Contributing Factors tab collects information about any factors that contributed to the outbreak.




Please select factors that were found during the investigation. Each contributing factor has two radio buttons so that the user can indicate whether the factor was "Confirmed/Documented" or "Suspected". Additional information for factors can be found in the NORS Waterborne Disease Reporting – Water List Values document.

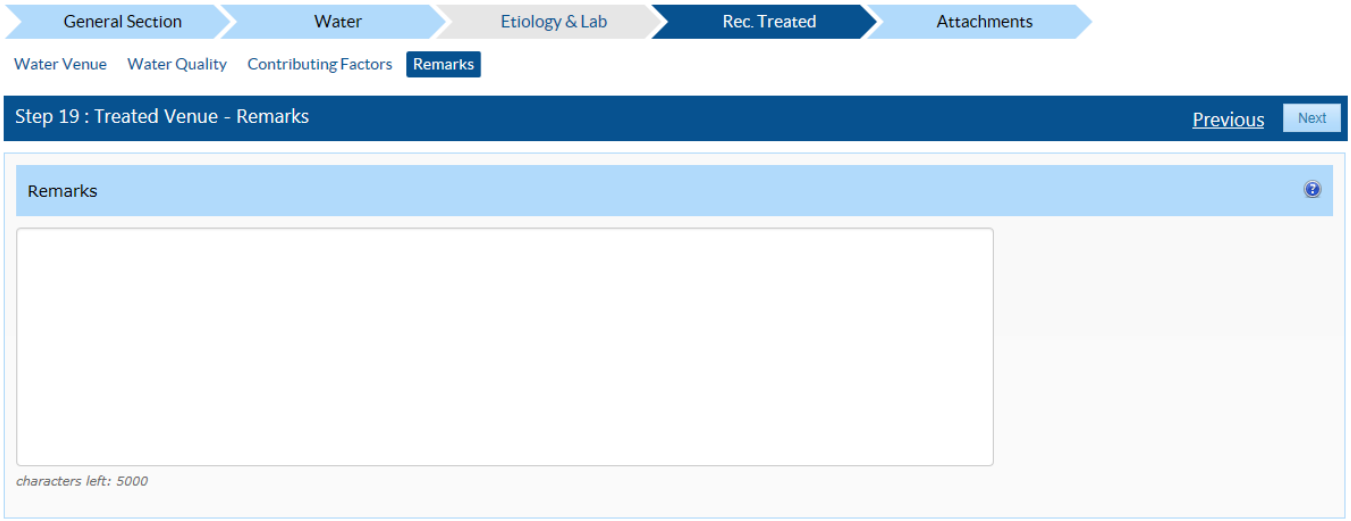
- **Confirmed/Documented** – Select "Confirmed/Documented" if information is gathered during document reviews, direct observations and/or interviews.
- **Suspected** – Select "Suspected" if factors that probably occurred but for which no documentation or observable evidence is available.

In a multi-venue outbreak (e.g., multiple community pools), please select factors if they were documented/observed or suspected for at least one venue. Clarification can be provided in the Remarks section.

If a contributing factor is not found in the list, users may add a factor at the bottom of the list in the "Factor not found?" text box.

## 5.4. Remarks Tab

The Remarks tab collects any additional information not collected in the previous Rec. Treated tabs. This can include additional information about the water venue, water quality, or contributing factors. Please provide any additional information that may be relevant to the outbreak investigation.

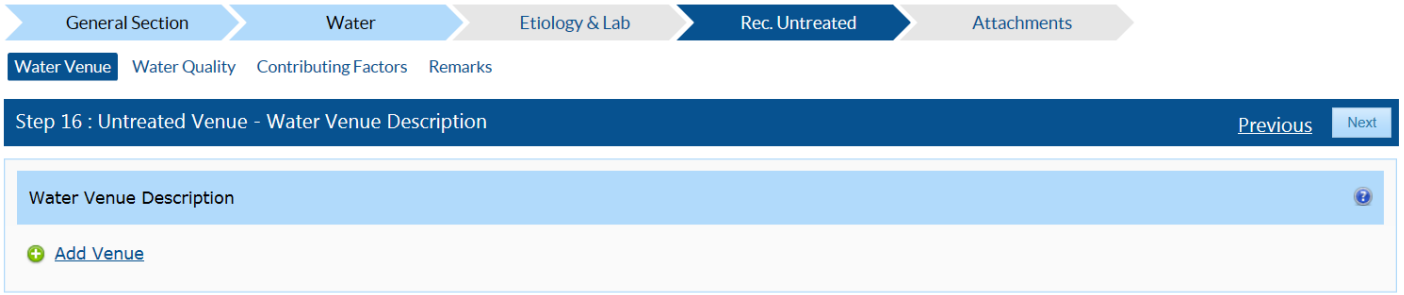


# 6. RECREATIONAL UNTREATED WATER – REC. UNTREATED SECTION

The Rec. Untreated section collects information about the type of recreational water venue, the water quality of the venue, and any contributing factors identified in the outbreak investigation.

## 6.1. Water Venue Tab

The Water Venue tab collects descriptive information about the untreated recreational water venue implicated in the outbreak investigation.



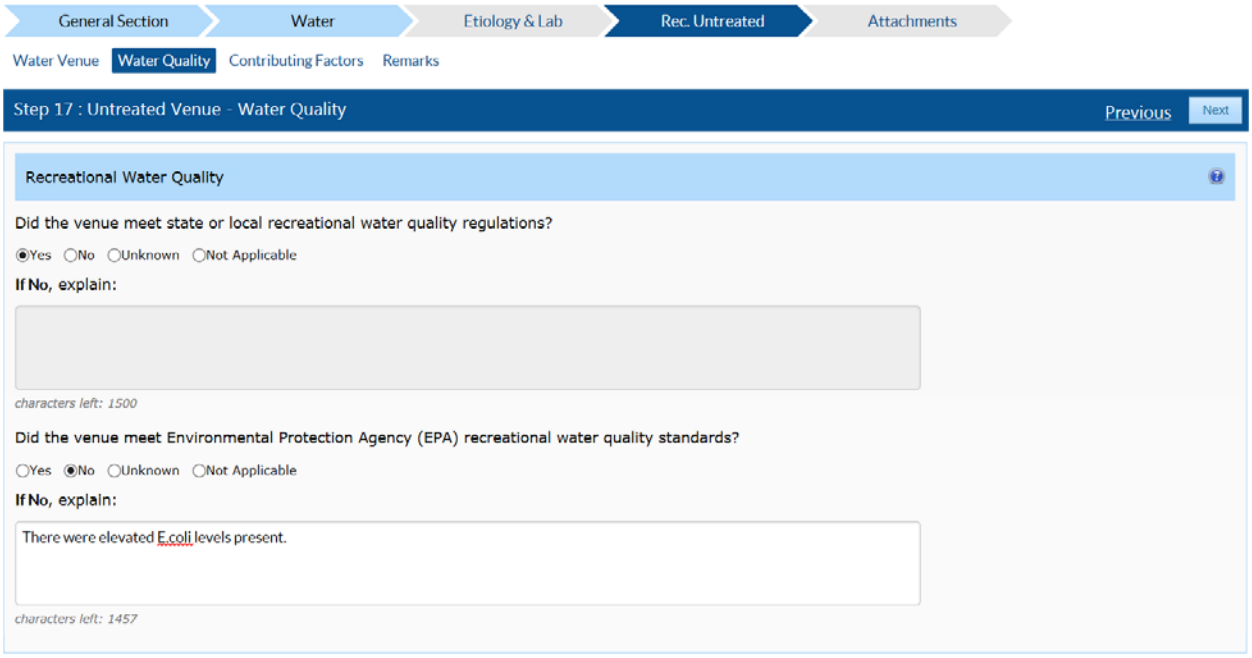

**Recreational Water Venue Table:**

This table allows you to describe one or more untreated water venues that were associated with the outbreak. Refer to the NORS Waterborne Disease Reporting – Water List Values for picklist options.

- **Water Venue** – Water Venue refers to types of untreated recreational water venues, such as a stream or lake. Note that some water types are combined, such as "Lake/Reservoir/Impoundment".
- **IF SPRING OR HOT SPRING, Water Subtype** – This field will allow you to indicate whether the location of a spring or hot spring was indoors, outdoors or unknown.
- **Setting of Exposure** – This field allows you to select descriptors that explain where the exposure to water occurred (e.g., beach, park). Note first that some settings are combined, such as "Camp/Cabin Setting".

## 6.2. Water Quality Tab

The Water Quality tab collects information about the water quality of the untreated recreational water body implicated in the outbreak investigation.

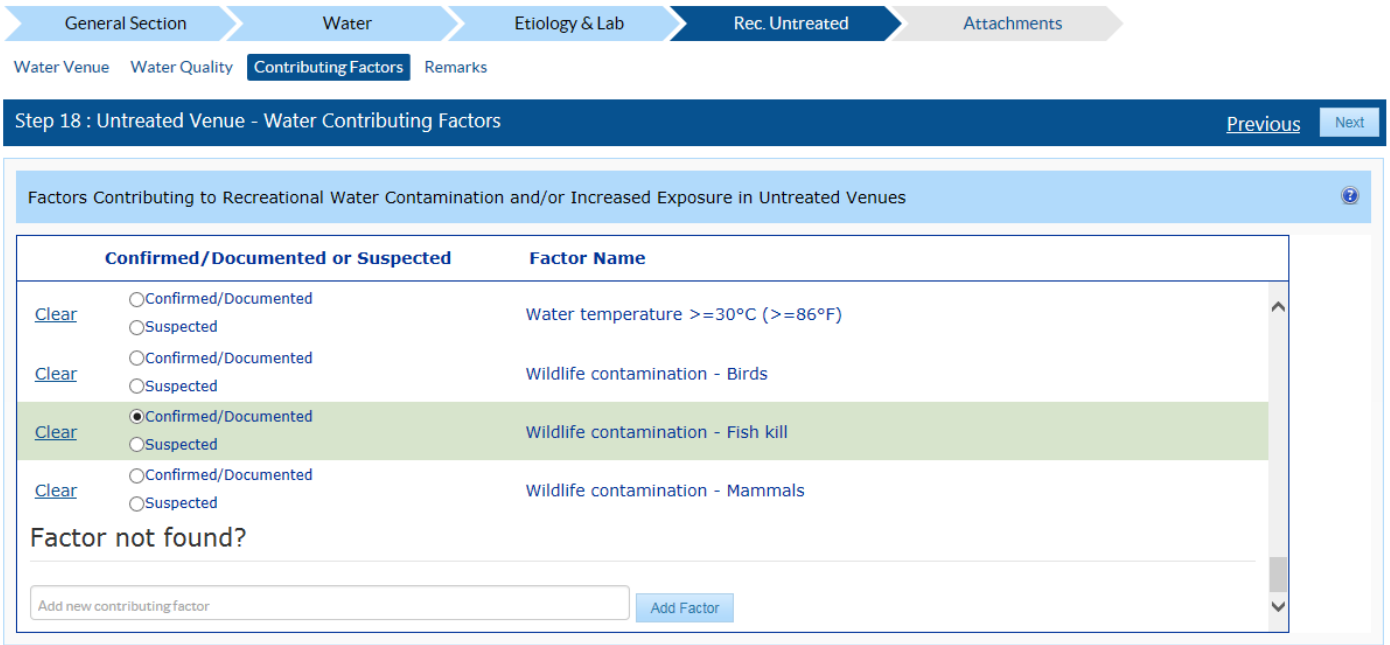



- **Did the venue meet state or local water quality regulations?** – Respond using the water quality regulations for the state or local jurisdiction where the water exposure that was associated with the outbreak occurred.
    - Answer "Yes" if the outbreak involved one or more venues (e.g., more than one lake) in one or more jurisdictions and the response would be "Yes" for all of the venues according to the regulations for the state where the exposure occurred.
    - Answer "No" if the outbreak involved one or more venues (e.g., more than one lake) in one or more jurisdictions and the response would be "No" for even one of the venues according to the regulations for the state where the exposure occurred. Provide an explanation in the text box if "No" is selected.
    - Answer "Unknown" if the response would be "Unknown" for one or more venues where the exposure occurred.
    - Answer "Not Applicable" if none of the exposures occurred at venues in the reporting state or if state or local recreational water quality regulations were not applicable to the venue(s).

- **Did the venue meet the Environmental Protection Agency (EPA) recreational water quality standards?** – Respond for the state or local jurisdiction where the water exposure that was associated with the outbreak occurred.
    - Answer "Yes" if the outbreak involved one or more venues (e.g., more than one lake) in one or more jurisdictions and the response would be "Yes" for all of the venues.
    - Answer "No" if the outbreak involved one or more venues (e.g., more than one lake) in one or more jurisdictions and the response would be "No" for even one of the venues. Provide an explanation in the text box if "No" is selected.
    - Answer "Unknown" if the response would be "Unknown" for one or more venues where the exposure occurred.
    - Answer "Not Applicable" if none of the exposures occurred at venues in the reporting state or if EPA regulations were not applicable to the venue(s).

## 6.3. Contributing Factors Tab

The Contributing Factors tab collects information about any factors that contributed to the outbreak.




Please select factors that were found during the investigation. Each contributing factor has two radio buttons so that the user can indicate whether the factor was "Confirmed/Documented" or "Suspected". Additional information for factors can be found in the NORS Waterborne Disease Reporting – Water List Values document.

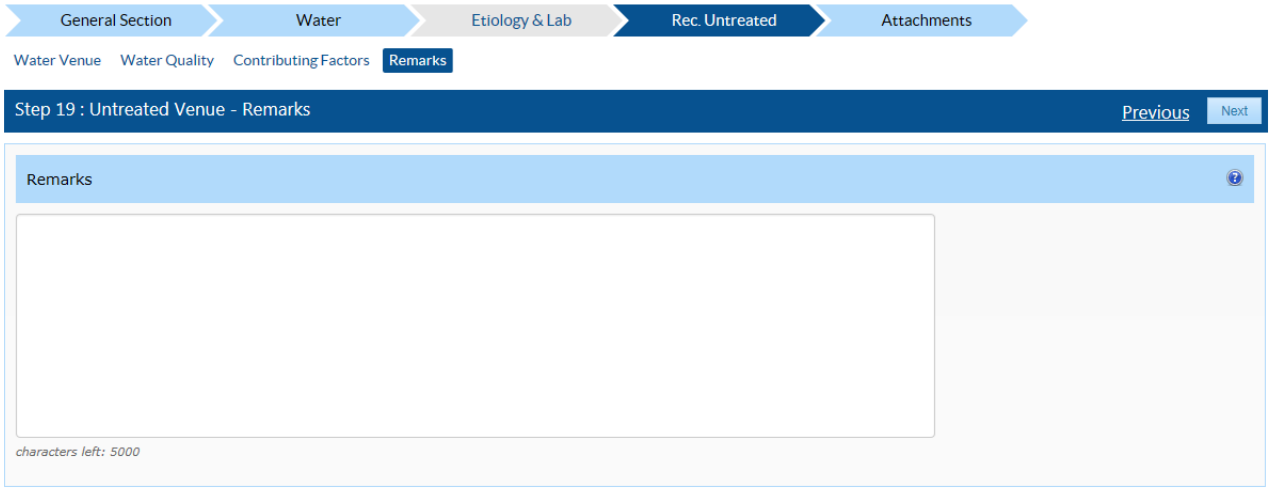
- **Confirmed/Documented** – Select "Confirmed/Documented" if information is gathered during document reviews, direct observations and/or interviews.
- **Suspected** – Select "Suspected" if factors that probably occurred but for which no documentation or observable evidence is available.

In a multi-venue outbreak (e.g., a lake and its downstream river), please select factors if they were documented/observed or suspected for at least one venue. Clarification can be provided in the Remarks section.

If a contributing factor is not found in the list, users may add a factor at the bottom of the list in the "Factor not found?" text box.

## 6.4. Remarks Tab

The Remarks tab collects any additional information not collected in the previous Rec. Untreated tabs. This can include additional information about the water venue, water quality, or contributing factors. Please provide any additional information that may be relevant to the outbreak investigation.



# 7. DRINKING WATER – DRINKING SECTION

The Drinking section collects information about the water system, the water quality, and any contributing factors identified in the outbreak investigation.

## 7.1. Water System Tab

The Water System tab collections information about the water system implicated in the outbreak investigation in a table.


**Water System Description Table:**

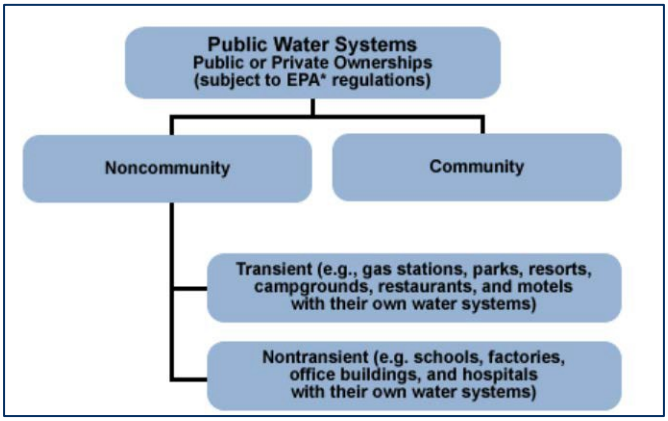
This table allows you to describe one or more drinking water systems that were associated with the outbreak. Refer to the NORS Waterborne Disease Reporting – Water Values List for picklist options.

- **Water System**– The "Water System" is further detailed in the remaining columns of the table. The following definitions may be used to differentiate among community, noncommunity and individual systems:
    - Community water system**:** A public water system that has ≥ 15 service connections used by year–round residents or regularly serves ≥ 25 year–round residents. A community water system might be owned by a private or public entity providing water to a community, subdivision, or mobile home park.
    - Nontransient Noncommunity Water System**:** A public water system that is not a community system. A nontransient noncommunity water system has ≥ 15 service connections or serves ≥ 25 of the same persons for >6 months/year (e.g., a factory or school) but does not serve year–round residents.
    - Transient Noncommunity Water System**:** A public water system that is not a community system. A transient noncommunity water system has ≥ 15 service connections or serves an average of ≥ 25 people for ≥ 60 days/year where

persons do not remain for long periods of time (e.g., restaurants, highway rest stations, and parks).

- Individual/Private Water System (also known as Non–Public Water System): A water system that does not meet the Environmental Protection Agency's (EPA) definition for a public water system. An individual/private water system is not owned or operated by a water utility. It has < 15 service connections or serves < 25 people.

- For more information about public water systems, please refer to the CDC's Drinking Water website (www.cdc.gov/healthywater/drinking/public/).




- **Public Water System EPA ID Number** – This is the number used for EPA reporting that uniquely identifies the water system within a specific state. The water system ID number can be found at http://www.epa.gov/enviro/sdwis–search by first selecting a state or territory and then searching by the water system name, the county, city, the population, or the status of the water system.

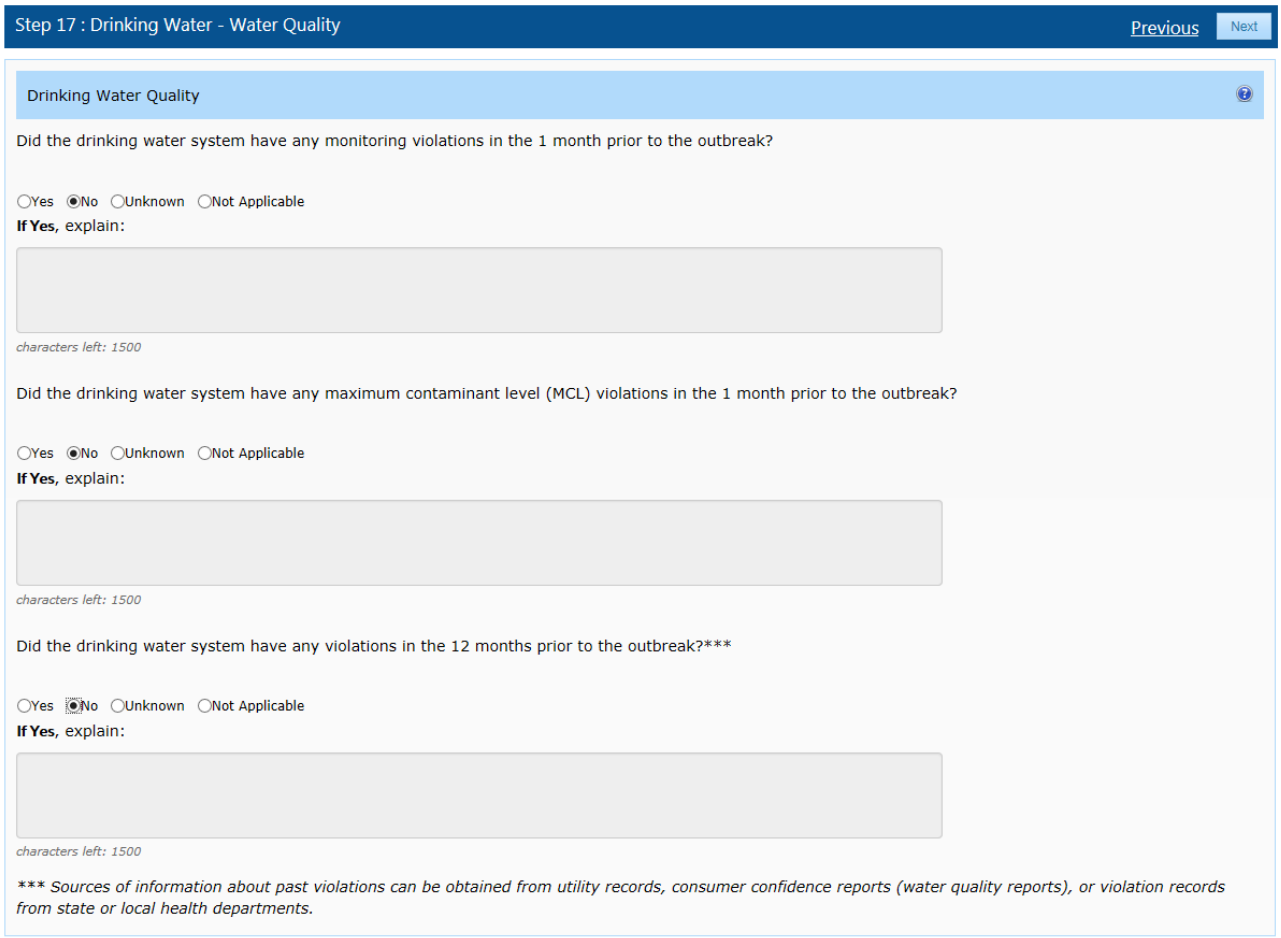
- **Water Source** – Enter whether or not the water was groundwater (well or spring water), surface water, groundwater under the influence of surface water (GWUDI), or unknown. CDC classifies all wells and springs as groundwater for the purposes of reporting waterborne disease outbreak data, unless they are GWUDI water sources. Direct influence must be determined for individual sources in accordance with criteria established by the state. GWUDI has been defined according to EPA regulation (40 CFR 141.2) as "any water beneath the surface of the ground with: a) a significant occurrence of insects or other macro–organisms, algae, organic debris, or large–diameter pathogens such as *Giardia lamblia* or *Cryptosporidium*; or b) significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions." For more information about GWUDI, please refer to EPA's consensus method for determining GWUDI document.

- **Water Source Description** – Select the type of water source description. Note that some water source descriptions are combined, such as Lake/Reservoir/Impoundment.

- **Setting of Exposure** – This field allows you to report descriptors that explain where the exposure to water occurred. For example, this field allows you to differentiate between a public beach (e.g., "Beach - Public") and a private beach (e.g., "Beach - Private"). Note that some settings are combined, such as "Farm/Agricultural Setting".
- **USUAL Water Treatment Provided** – Complete this section to provide more information about the type of water treatment usually provided before water use or water consumption. Treatment can occur at any point in the distribution system. If filtration usually occurred, specify whether it was done at the treatment plant or at home/point–of–use. Enter information about the usual water treatments, regardless of whether or not these treatments were operating correctly at or just prior to the time of the outbreak.
- **Water Treatment Subtype** – Complete this section to provide more information about the disinfection or filtration method used to treat the water.

## 7.2. Water Quality Tab

The Water Quality tab collects information about past violations that can be obtained from utility records, consumer confidence reports (water quality reports), or violation records from state or local health departments.



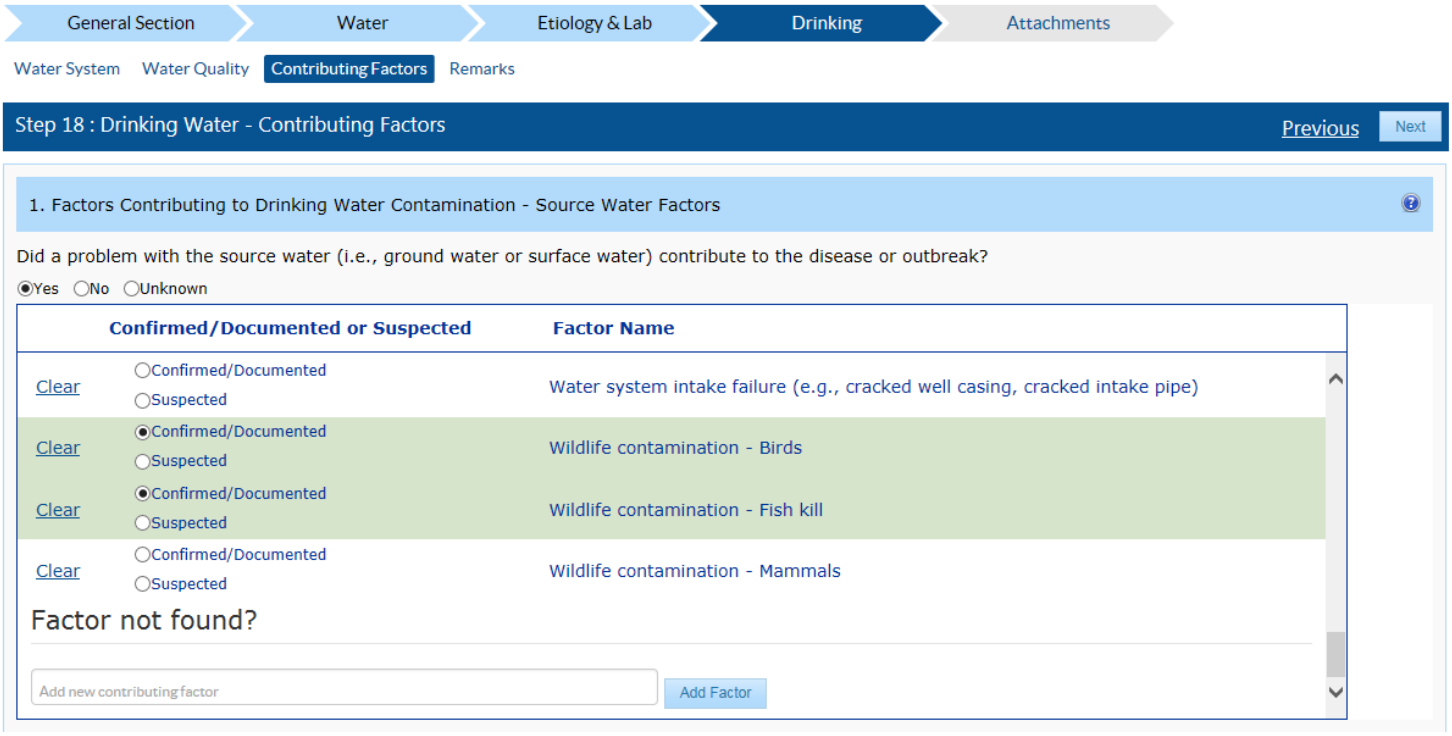

- **Did the drinking water system have any monitoring violations in the 1 month prior to the outbreak?** – Respond using the drinking water system quality regulations for the state or local jurisdiction where the drinking water exposure that was associated with the outbreak occurred.
    - Answer “Yes” if one or more drinking water systems involved in the outbreak (e.g., a community water system and an individual/private water system) had any monitoring violation in the 1 month prior to the outbreak. Provide an explanation in the text box if “Yes” is selected.
    - Answer “No” if none of the drinking water system(s) involved in the outbreak had any monitoring violation in the 1 month prior to the outbreak.
    - Answer “Unknown” if f there were no known violations but information is not available for one (or more) drinking water system(s)”.
    - Answer “Not Applicable” if this question does not apply to the drinking water system(s) involved in the outbreak (e.g., individual/private water system that does not have any monitoring requirements).

- **Did the drinking water system have any maximum contaminant level (MCL) violations in the 1 month prior to the outbreak?** – Respond using the maximum contaminant level (MCL) regulations for the state or local jurisdiction where the drinking water exposure that was associated with the outbreak occurred.
    - Answer "Yes" if one or more drinking water systems involved in the outbreak (e.g., a community water system and an individual/private water system) had any MCL violations in the 1 month prior to the outbreak. Provide an explanation in the text box if "Yes" is selected.
    - Answer "No" if none of the drinking water system(s) involved in the outbreak had any MCL violations in the 1 month prior to the outbreak.
    - Answer "Unknown" if there were no known MCL violations but information is not available for one (or more) drinking water system(s).
    - Answer "Not Applicable" if this question does not apply to the drinking water system(s) involved in the outbreak (e.g., individual/private water system that does not have any MCL requirements).

- **Did the drinking water system have any violations in the 12 months prior to the outbreak?** – Respond using the drinking water system regulations for the state or local jurisdiction where the drinking water exposure that was associated with the outbreak occurred.
    - Answer "Yes" if one or more drinking water systems involved in the outbreak (e.g., a community water system and an individual/private water system) had any monitoring violation in the 12 months prior to the outbreak. Provide an explanation in the text box if "Yes" is selected.
    - Answer "No" if none of the drinking water system(s) involved in the outbreak had any monitoring violations in the 12 months prior to the outbreak.
    - Answer "Unknown" if there were no known violations but information is not available for one (or more) drinking water system(s).
    - Answer "Not Applicable" if this question does not apply to the drinking water system(s) involved in the outbreak (e.g., individual/private water system that does not have any monitoring requirements).

## 7.3. Contributing Factors Tab

The Contributing Factors tab collects information about any factors that contributed to the outbreak.




There are four sections that collect contributing factor information about drinking water implicated in an outbreak investigation: the Source Water Factors section, the Treatment Factors section, the Distribution and Storage Factors section, and the Factors Not Under the Jurisdiction of the Water Utility section. For all four contributing factors sections, please select factors identified during the investigation.

Please select factors that were found during the investigation. Each contributing factor has two radio buttons so that the user can indicate whether the factor was "Confirmed/Documented" or "Suspected". Additional information for factors can be found in the NORS Waterborne Disease Reporting – Water List Values document.

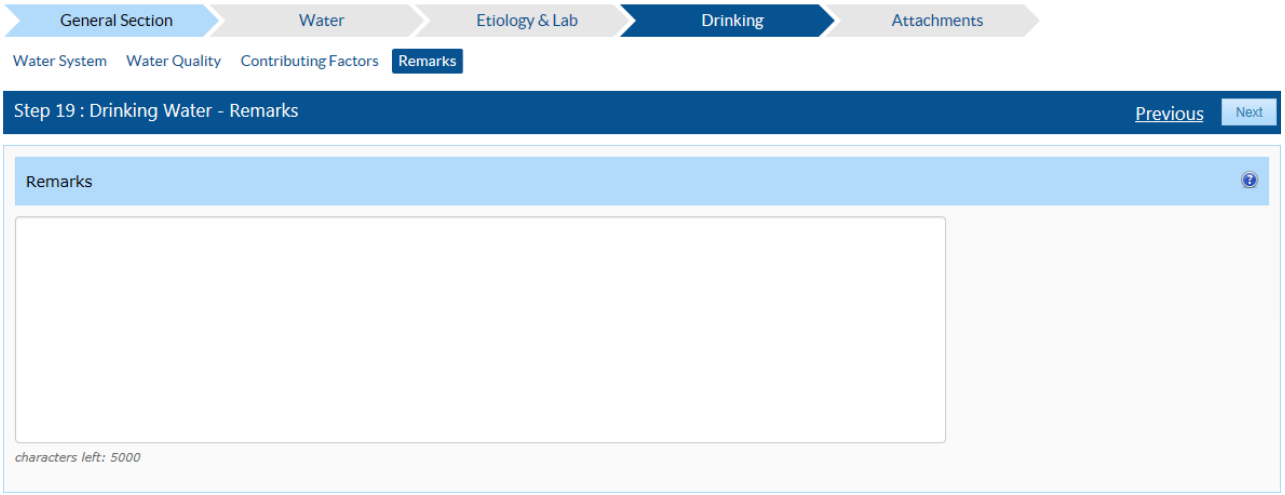
- **Confirmed/Documented** – Select "Confirmed/Documented" if information is gathered during document reviews, direct observations and/or interviews.
- **Suspected** – Select "Suspected" if factors that probably occurred but for which no documentation or observable evidence is available.

In an outbreak that involved multiple drinking water systems, please select factors if they were documented/observed or suspected for at least one drinking water system. Clarification can be provided in the Remarks section.

If a contributing factor is not found any of the four contributing factors sections, users may add a factor at the bottom of the list in the "Factor not found?" text box.

## 7.4. Remarks Tab

The Remarks tab collects any additional information not collected in the previous Drinking tabs. This can include additional information about the water system, water quality, or contributing factors. Please provide any additional information that may be relevant to the outbreak investigation.

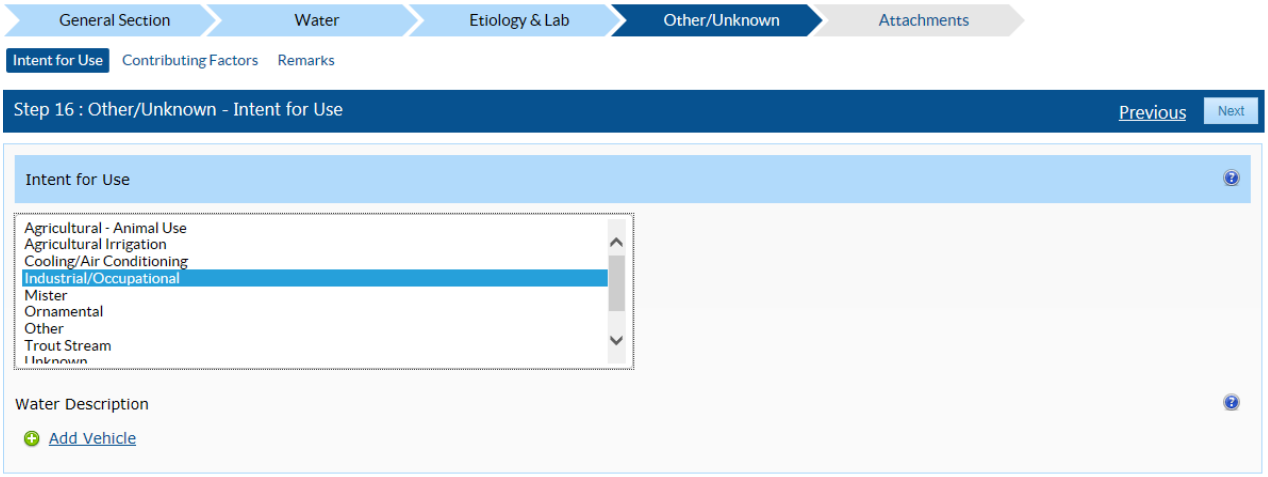


# 8. OTHER WATER OR WATER OF UNKNOWN INTENT – OTHER/UNKNOWN SECTION

The Other/Unknown section collects information about the intended use of the water, if known, and any contributing factors identified in the outbreak investigation.

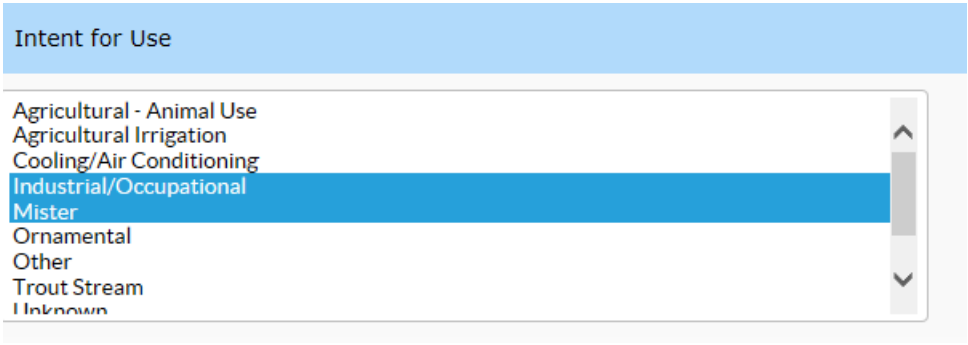
## 8.1. Intent for Use Tab

The Intent for Use tab collects information about the other water or unknown water uses implicated in the outbreak investigation in two sections: the Intent for Use section and the Water Description section.



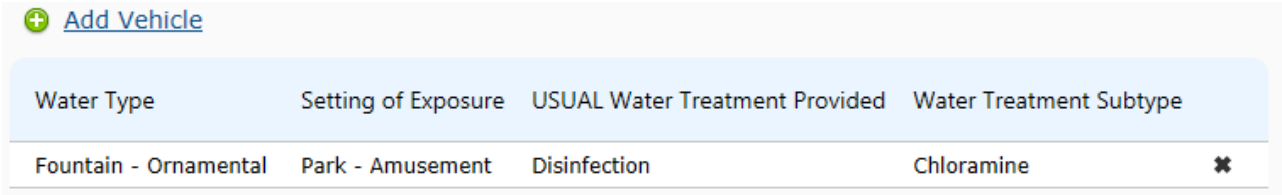
### 8.1.1. Intent for Use Section

In the Intent for Use section, select from the list the intended use of the water implicated in the outbreak investigation. More than one intended use for the water can be selected in the list. If "Other" is selected, please describe the other intended use of the water in the Remarks sections.




### 8.1.2. Water Description Section

The Water Description section collects descriptive information about the other water or unknown water uses implicated in the outbreak investigation in a table. Refer to the NORS Waterborne Disease Reporting – Water List Values for picklist options.




**Water Description Table:**

- **Water Type** – Select the water type that the water exposure. If no single source of exposure was identified, please enter "Unknown" and describe any suspected sources in the Remarks. Note that some water source descriptions are combined, such as "Evaporative Condenser/Air Conditioner".
- **Setting of Exposure** – This field allows you to report descriptors that explain where the exposure to water occurred. For example, this field allows you to differentiate between types of park settings (e.g., "Park – State Park" and "Park – "Forestry Service"). Note that some settings are combined, such as "Community/Municipality".
- **USUAL Water Treatment Provided** – Complete this section to provide more information about the type of water treatment usually provided before water use. Treatment can occur at any point of use. Enter information about the usual water treatments (e.g., filtration, U.V., boiling), regardless of whether or not these treatments were operating correctly at or just prior to the time of the outbreak.
- **Water Treatment Subtype** – Complete this section to provide more information about the disinfection or filtration method used to treat the water.

## 8.2. Contributing Factors Tab

The Contributing Factors tab collects information about any factors that contributed to the outbreak.


Please select factors that were found during the investigation. Each contributing factor has two radio buttons so that the user can indicate whether the factor was "Confirmed/Documented" or "Suspected". Additional information for factors can be found in the NORS Waterborne Disease Reporting – Water List Values document.

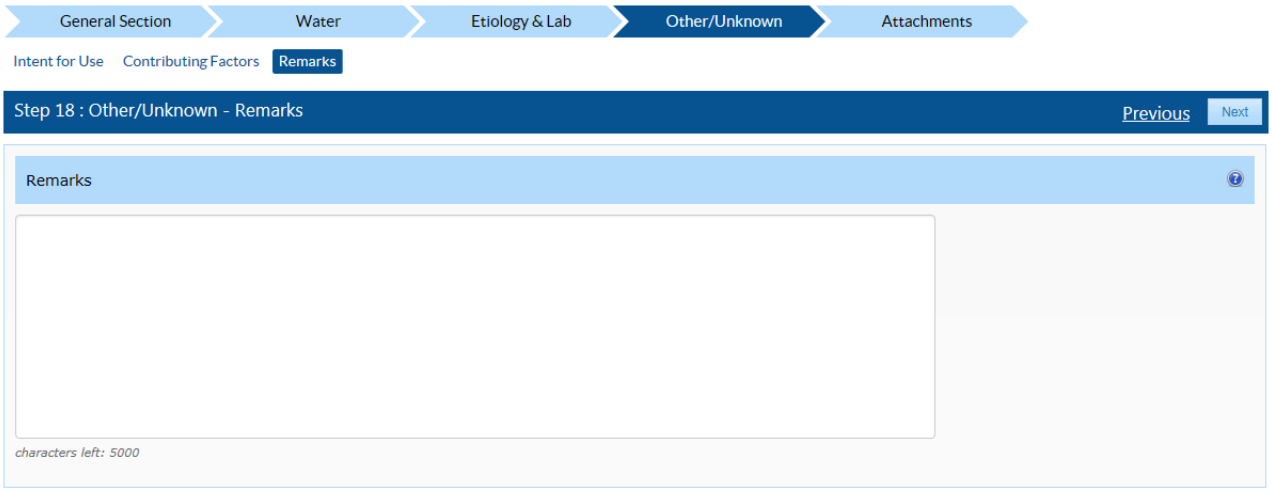
- **Confirmed/Documented** – Select "Confirmed/Documented" if information is gathered during document reviews, direct observations and/or interviews.
- **Suspected** – Select "Suspected" if factors that probably occurred but for which no documentation or observable evidence is available.

In a multi-source outbreak (e.g., multiple parks), please select factors if they were documented/observed or suspected for at least one source. Clarification can be provided in the Remarks section.

If a contributing factor is not found any of the four contributing factors sections, users may add a factor at the bottom of the list in the "Factor not found?" text box.

## 8.3. Remarks Tab

The Remarks tab collects any additional information not collected in the previous Other/Unknown tabs about the intent for use or contributing factors. Please provide any additional information that may be relevant to the outbreak investigation.



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