



**IDEXX Water Academy
Presents**

Simplifying Drinking Water Testing for Confident, Reliable Results

with

Emily Frawley

Product Manager
IDEXX Water



Before we get started...

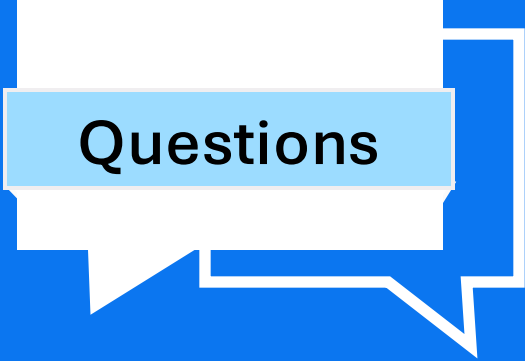
Technical issue?
Refresh your browser 

Your certificate of completion and the webinar recording will be emailed to you after the webinar.



Chat

Interact with the team
and your peers



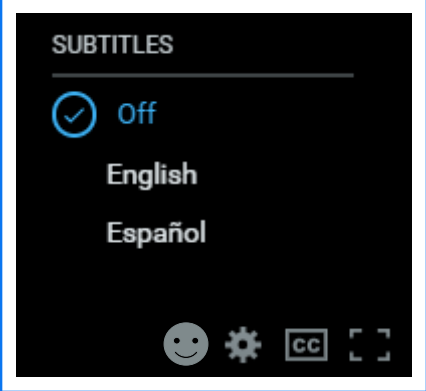
Questions

Ask questions



Handouts

View, download,
or print



SUBTITLES

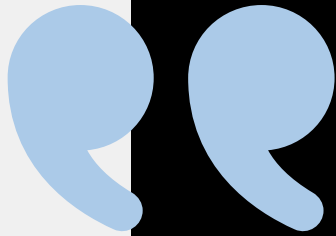
☒ Off
English
Español

Hover over video window,
select **CC** and choose
your preferred language



Emily Frawley

Product Manager,
IDEXX Water



Globally, at least **2 billion** people use a drinking water source contaminated with feces.

Microbial contamination of drinking-water as a result of contamination with feces poses the greatest risk to drinking-water safety.



World Health
Organization

From Source to Tap



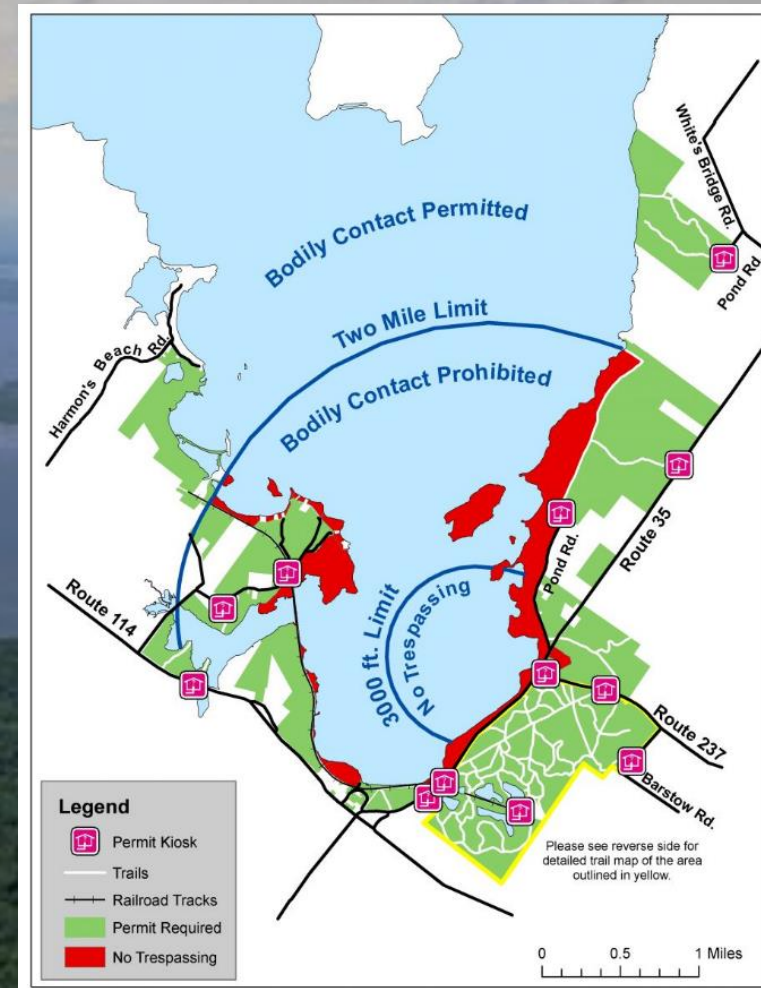
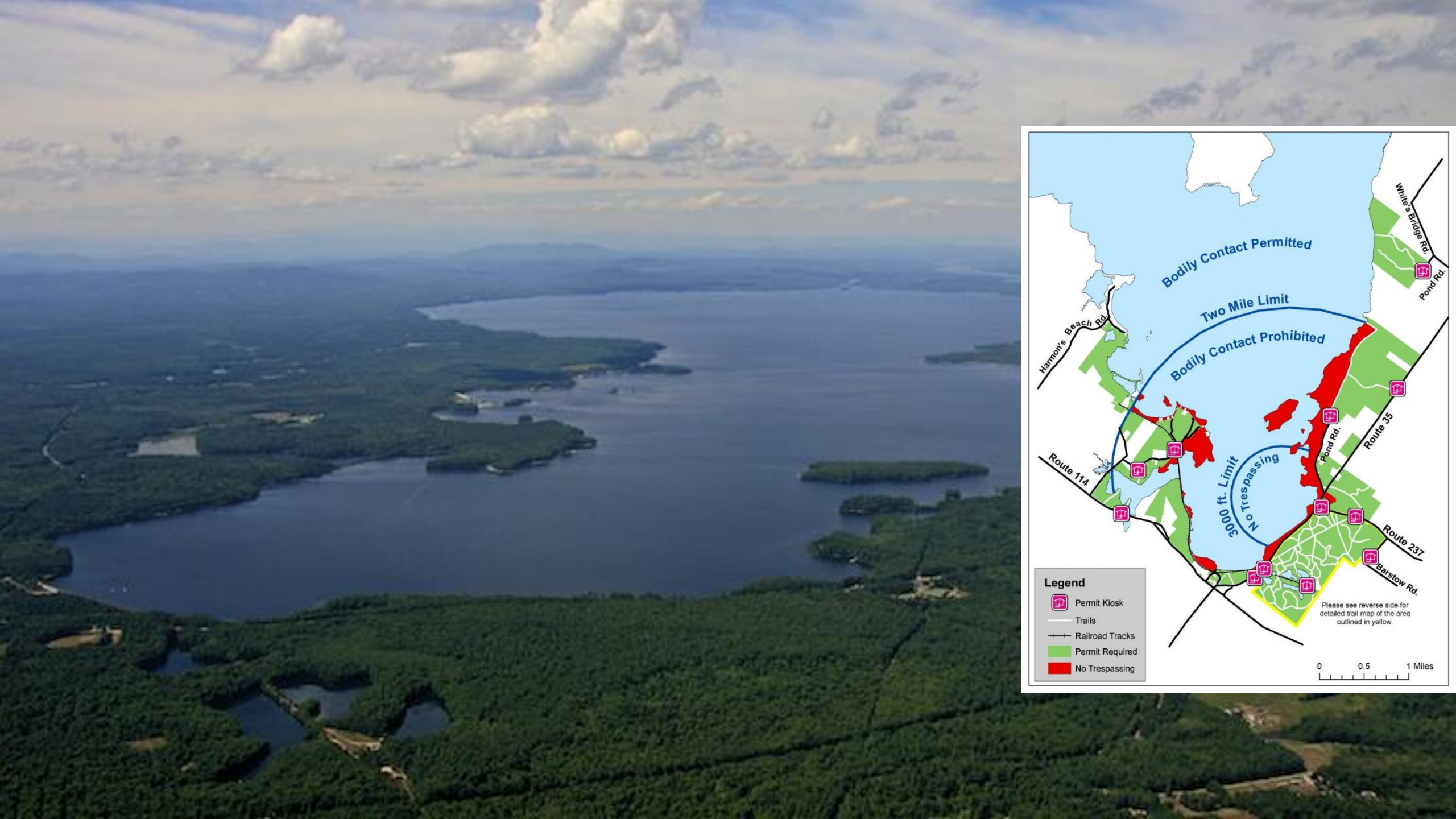
SOURCE →

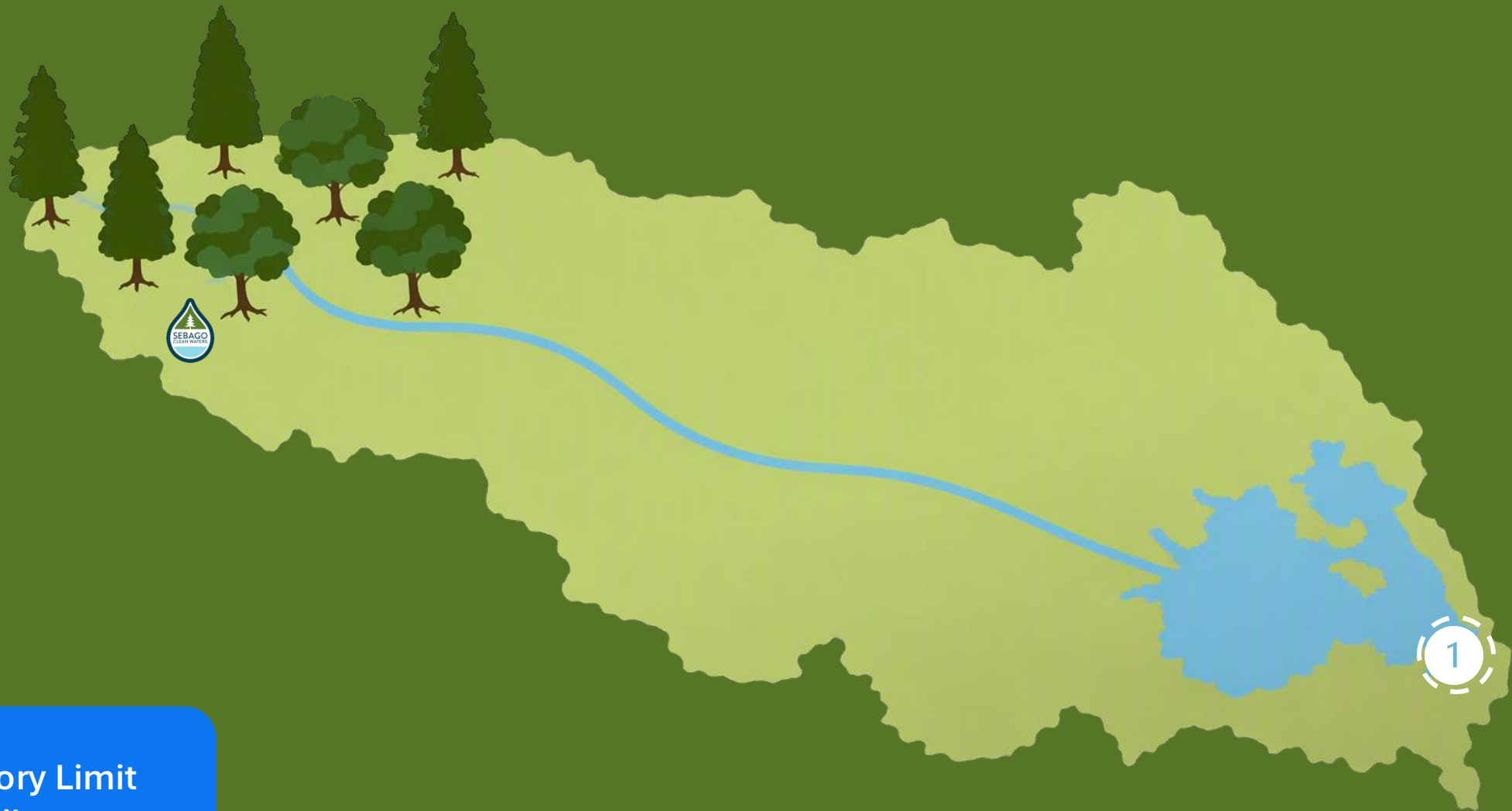


TREATMENT AND TESTING →



DISTRIBUTION

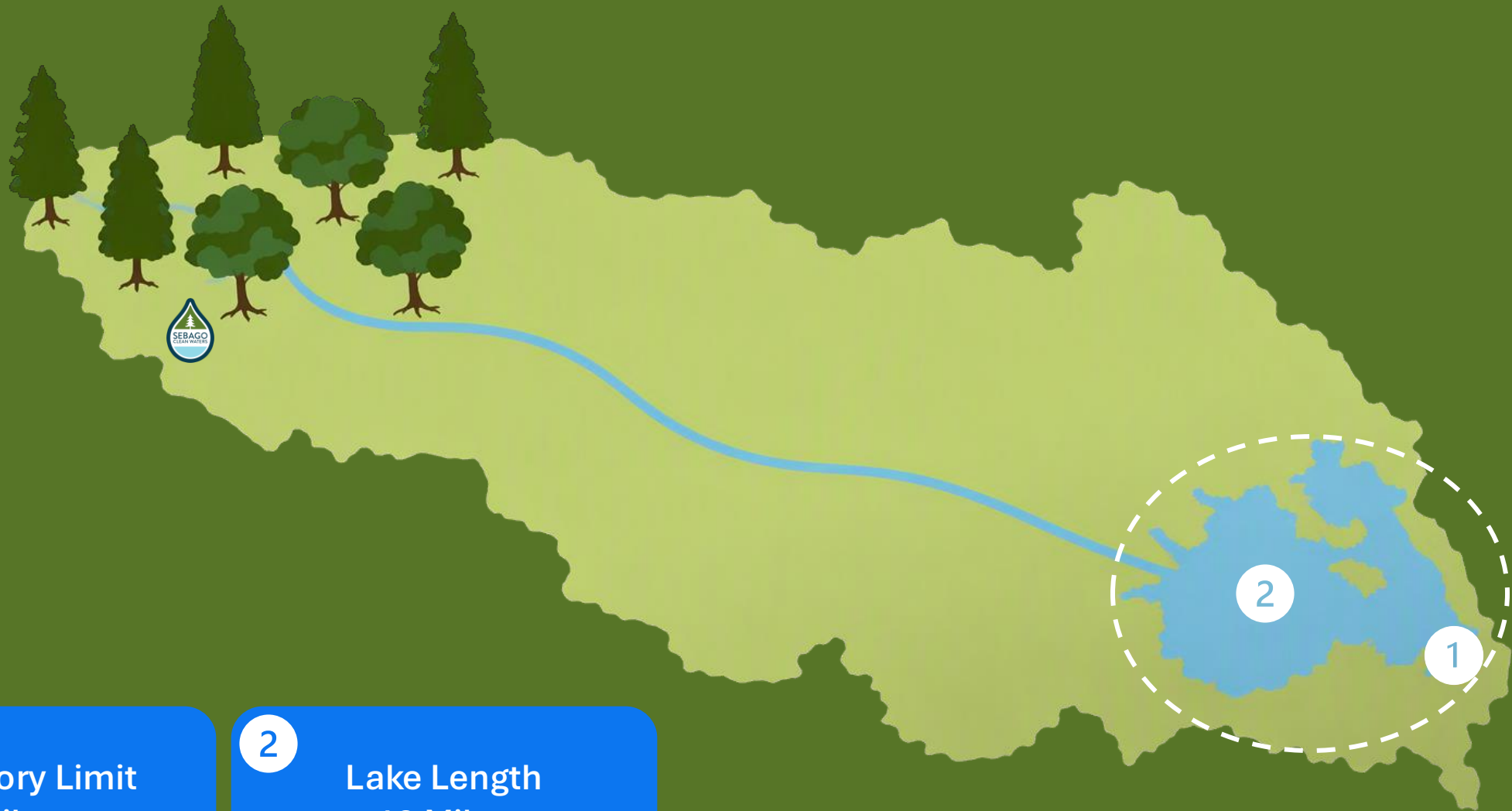




1
Regulatory Limit
2 Miles

RELATIVE SCALE COMPARISON





1

Regulatory Limit
2 Miles

2

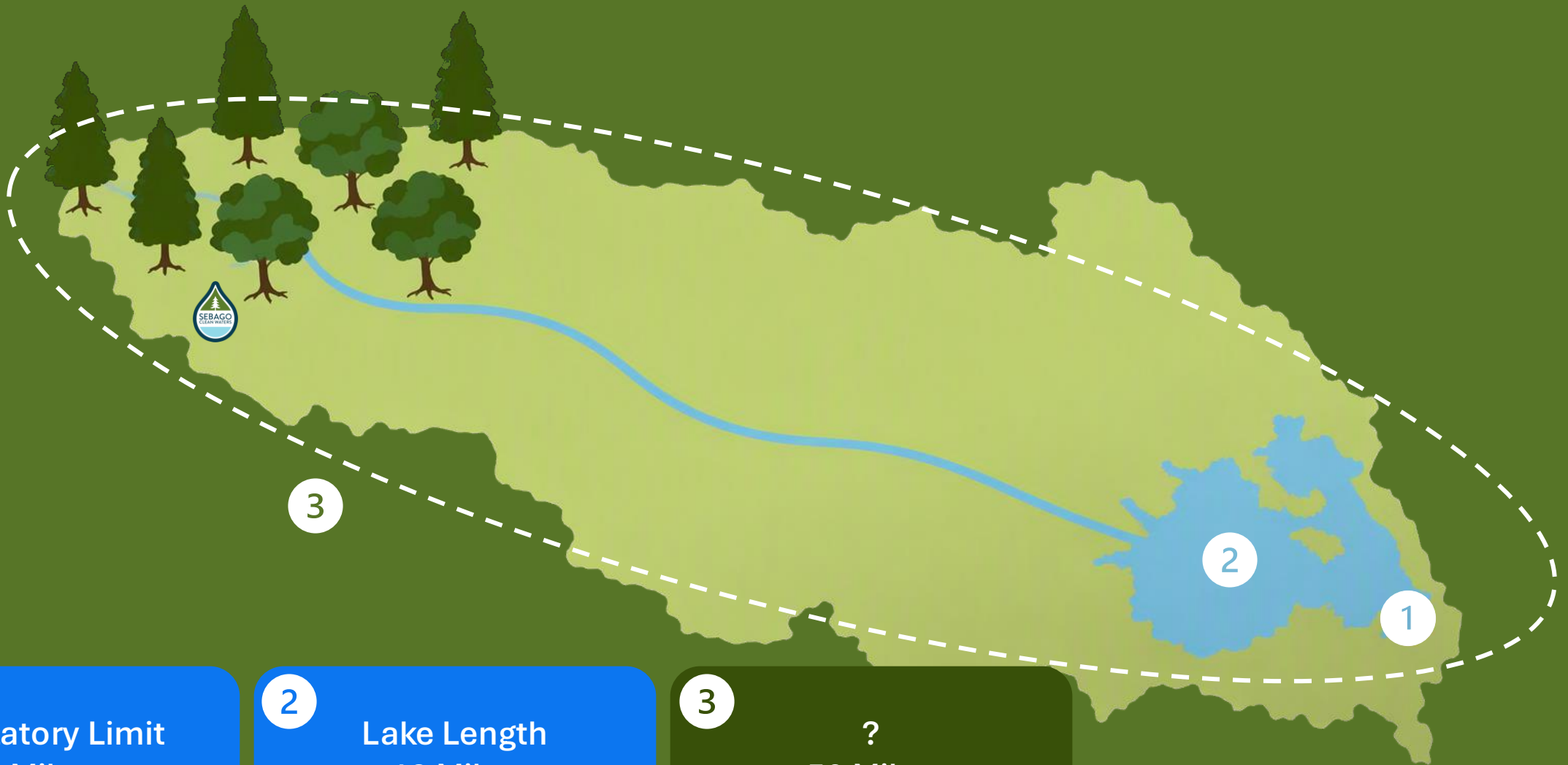
Lake Length
12 Miles

RELATIVE SCALE COMPARISON

50 Miles

12 Miles | Lake Length

2 Miles | Regulatory Limit



1

Regulatory Limit
2 Miles

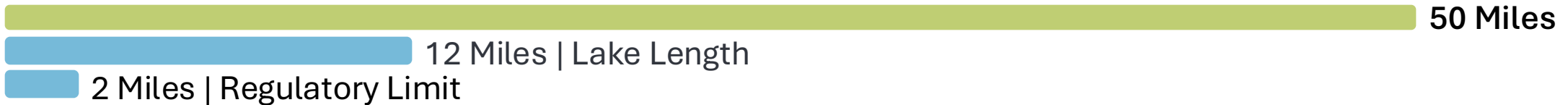
2

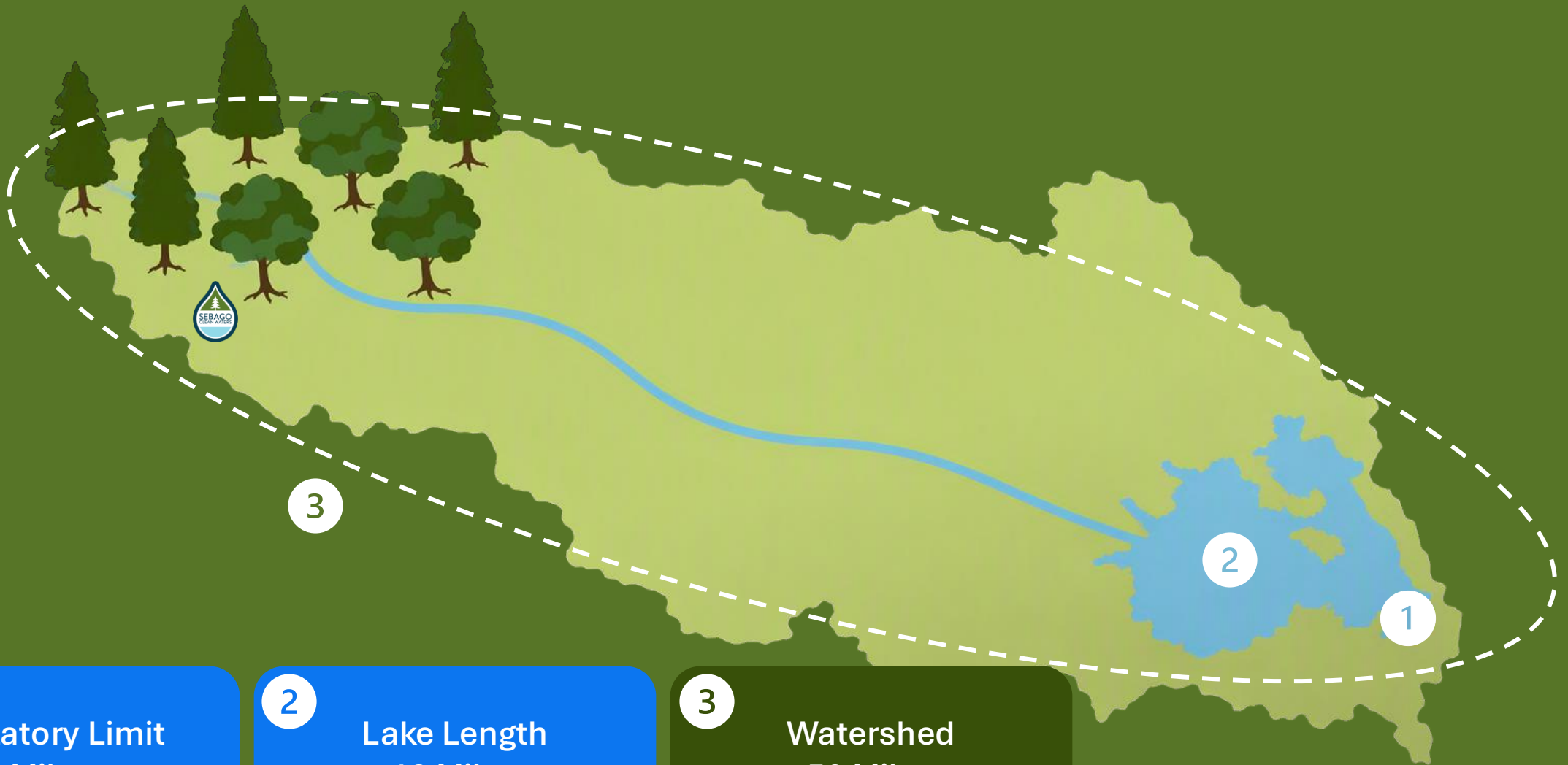
Lake Length
12 Miles

3

?
50 Miles

RELATIVE SCALE COMPARISON





1
Regulatory Limit
2 Miles

2
Lake Length
12 Miles

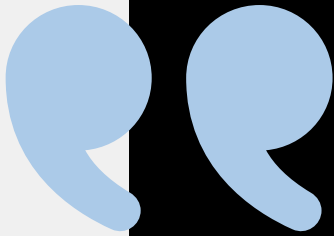
3
Watershed
50 Miles

RELATIVE SCALE COMPARISON



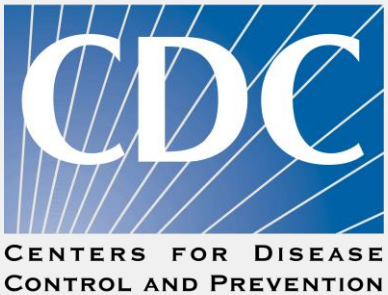
Water Treatment Steps

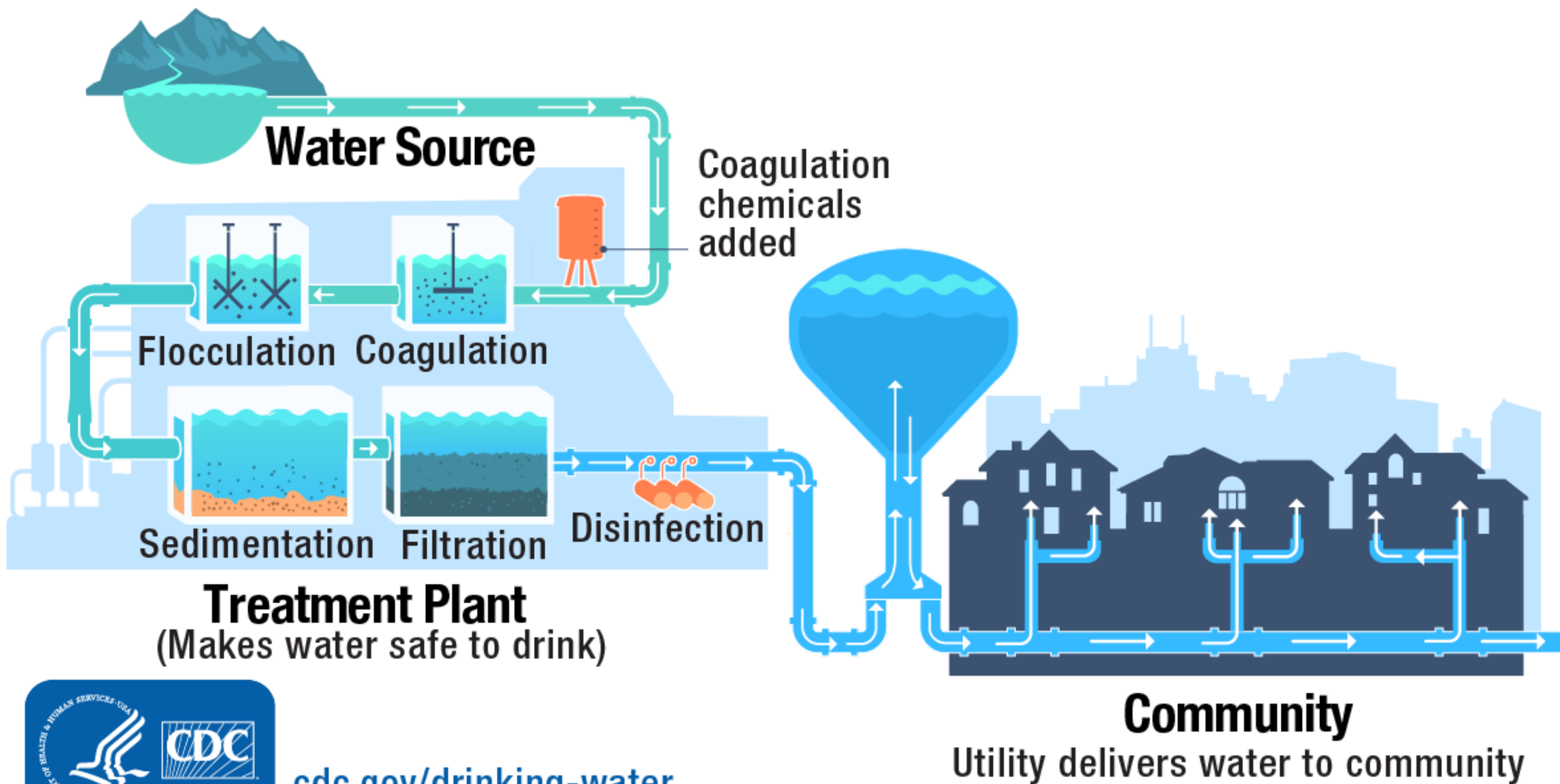




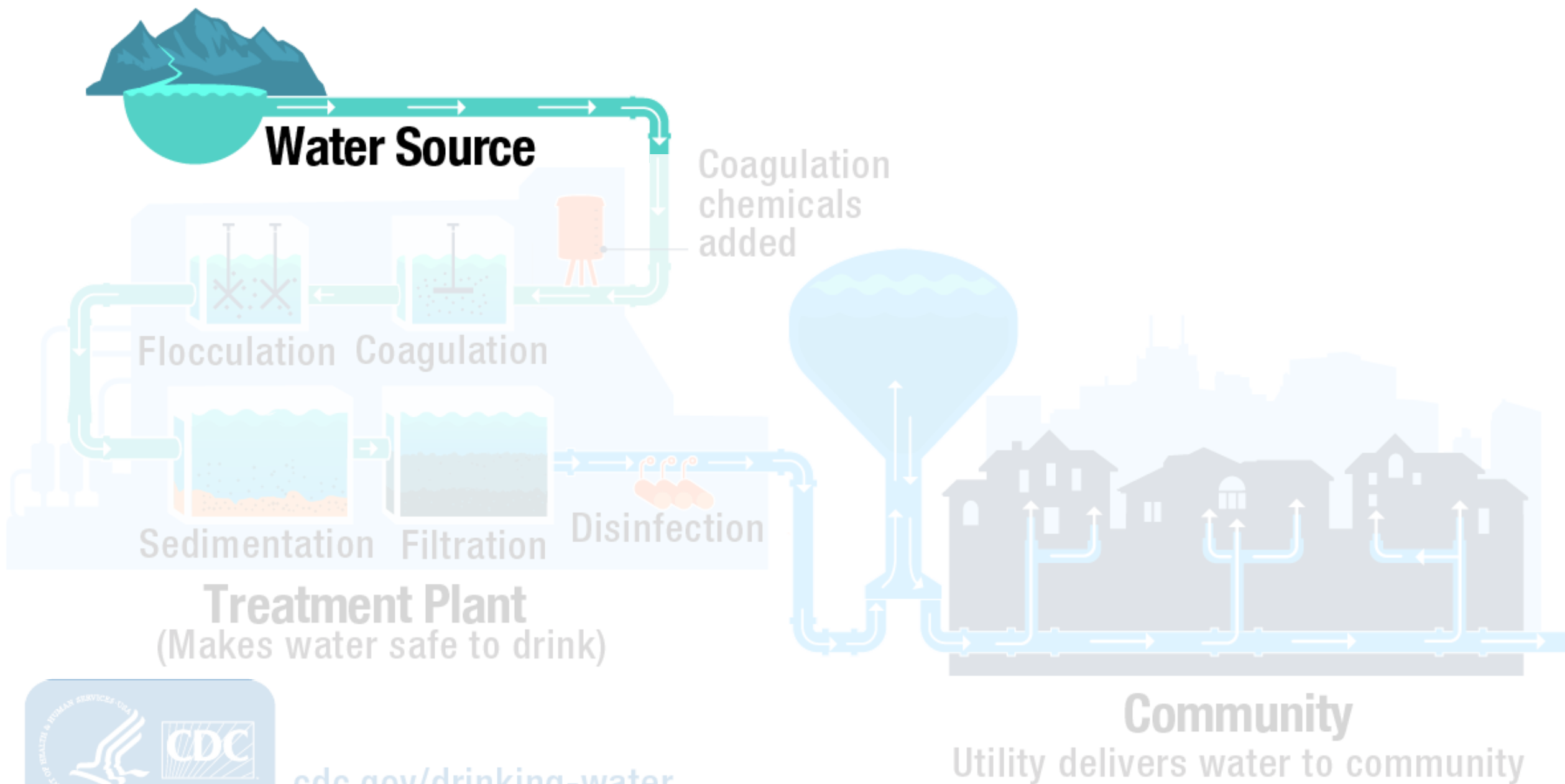
Public drinking water systems use different water treatment methods to provide safe drinking water for their communities.

Public water systems often use a series of water treatment steps that include **coagulation, flocculation, sedimentation, filtration, and disinfection.**

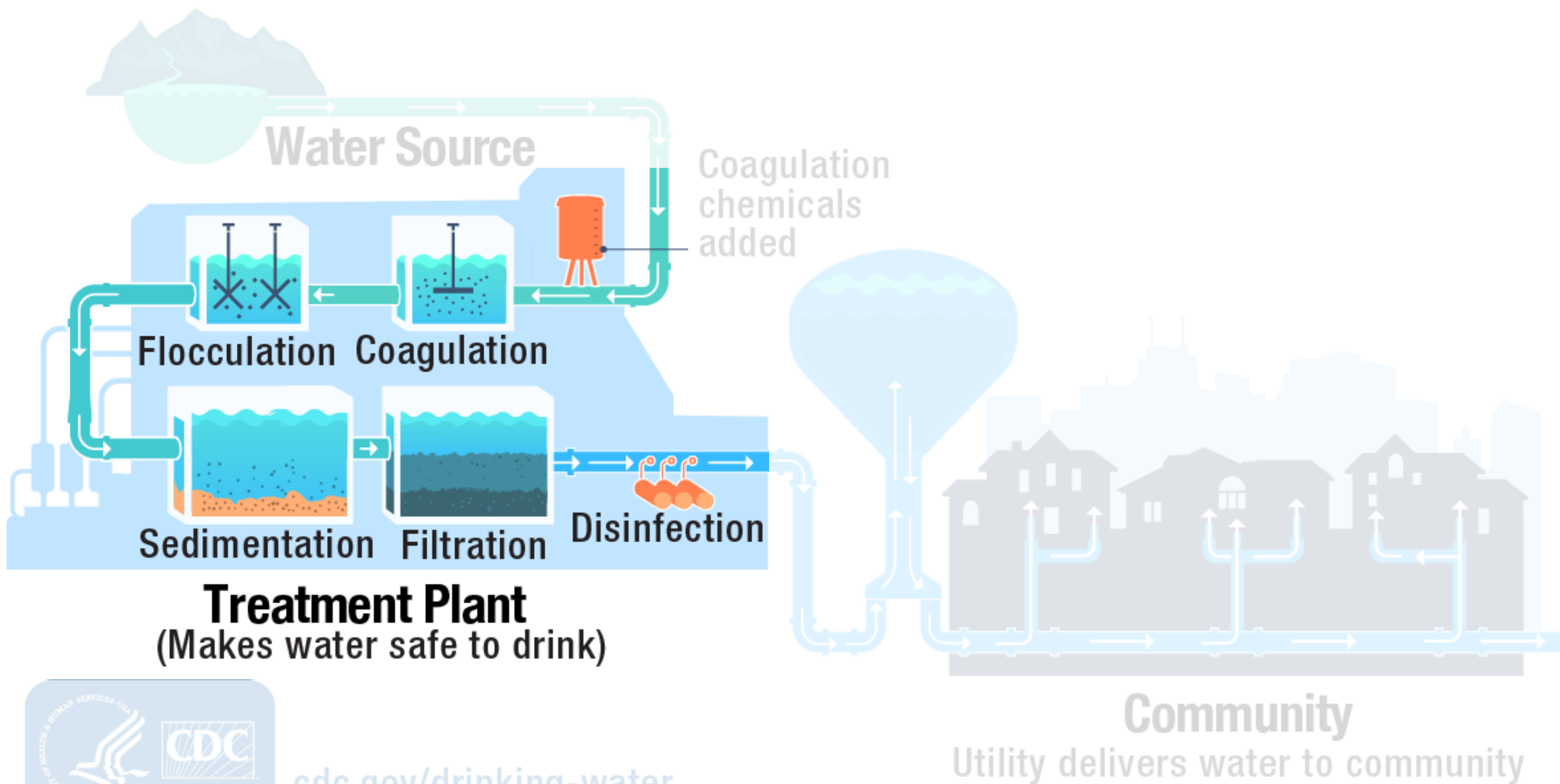




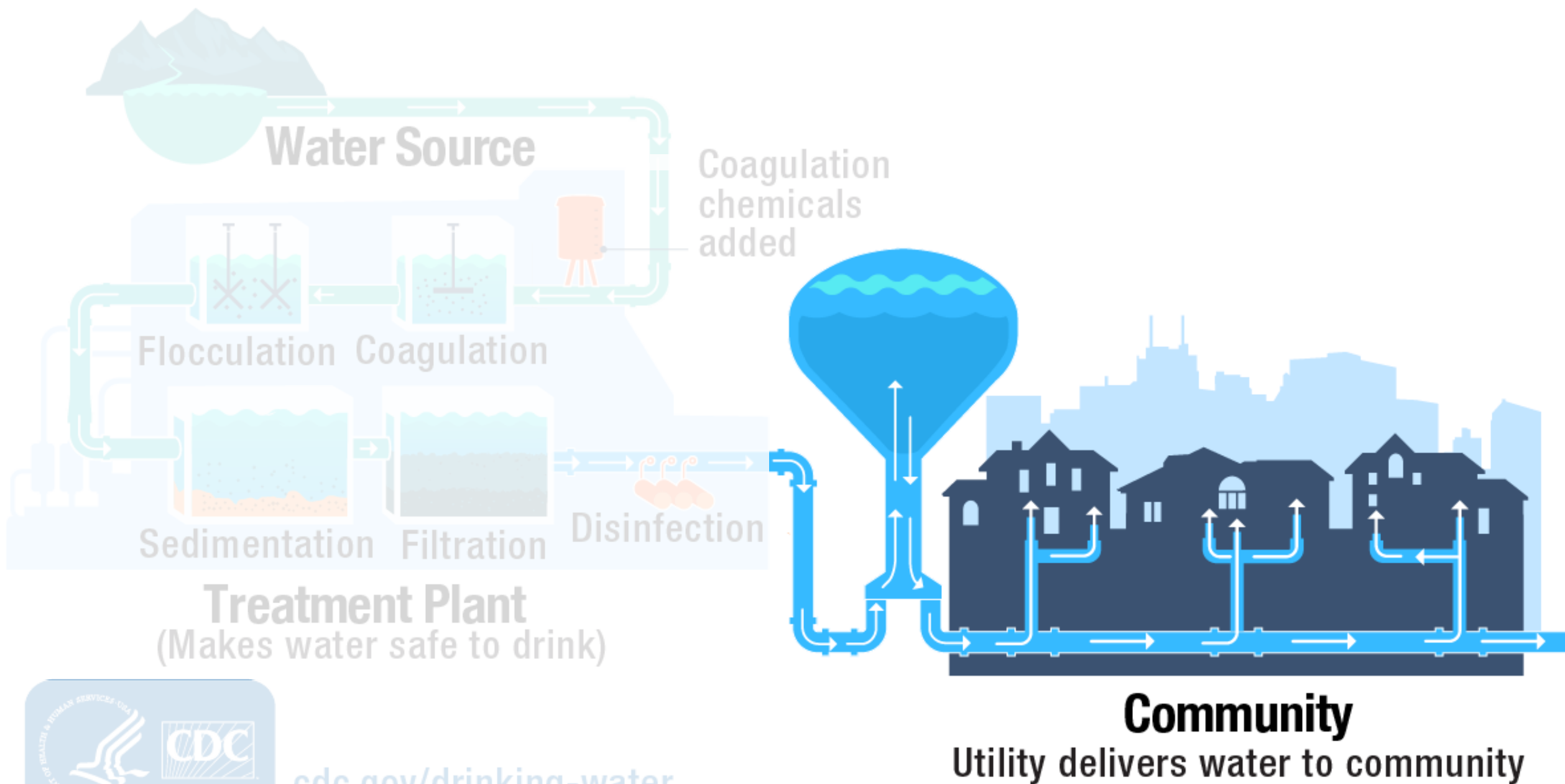
cdc.gov/drinking-water



cdc.gov/drinking-water



cdc.gov/drinking-water



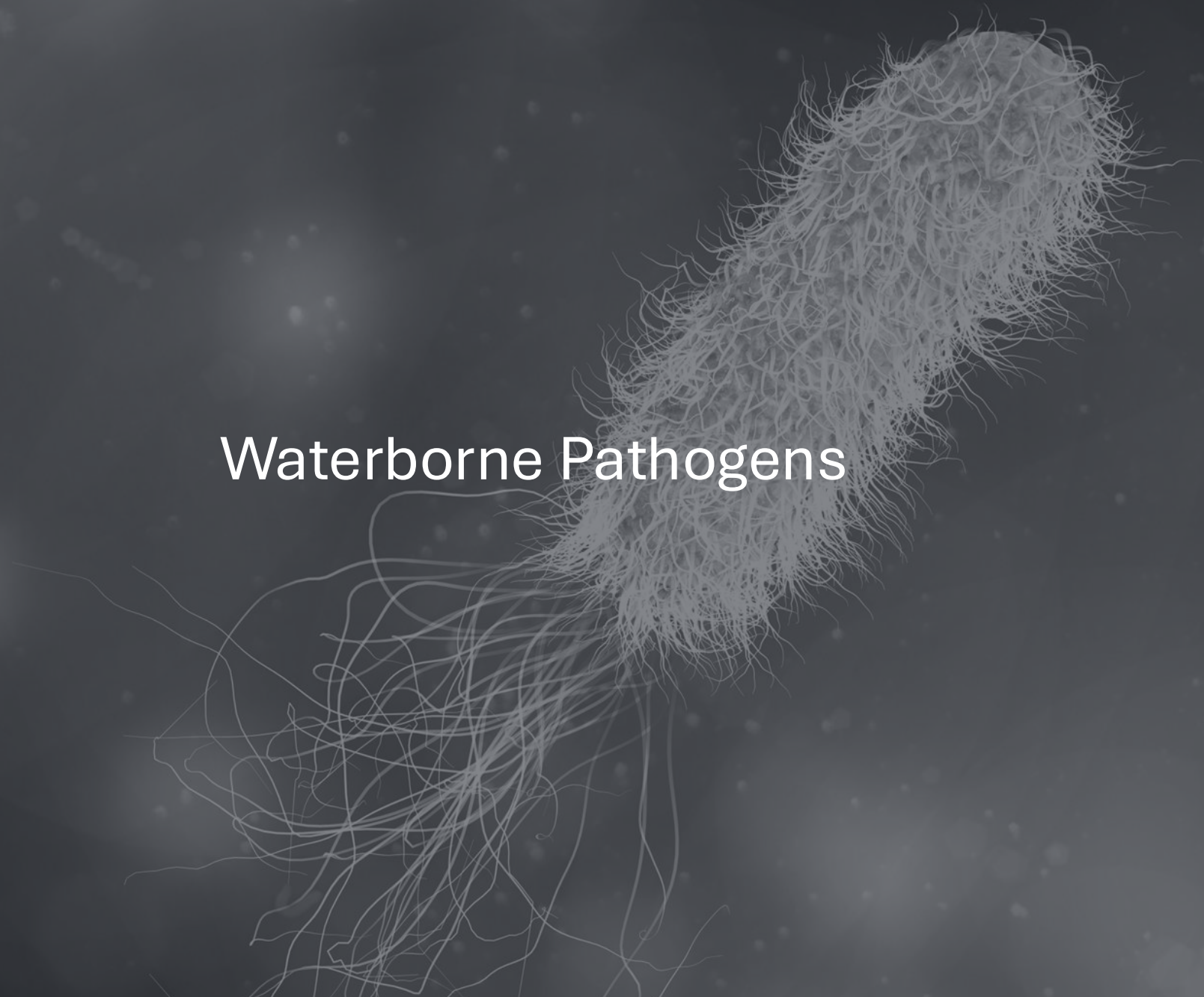
cdc.gov/drinking-water

Let us know in the Chat!



How many different testing sites does your lab have?

Waterborne Pathogens



- *Escherichia coli*
- *Enterococcus*
- *Cryptosporidium*
- *Giardia*
- *Legionella pneumophila*
- *Pseudomonas aeruginosa*



Did you know?

Cryptosporidium Outbreak 1993 Milwaukee, Wisconsin, USA

↑ 400,000 people affected

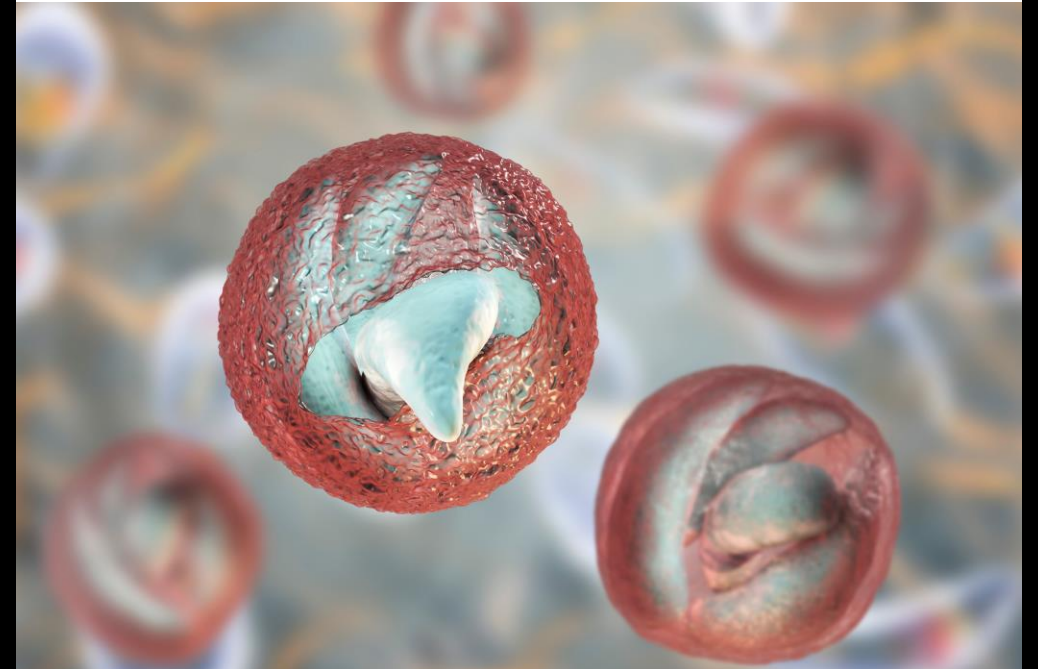
↑ 4,000 hospitalized

104 people died

MILWAUKEE NEWS

Milwaukee marks 20 years since *Cryptosporidium* outbreak

City water remains free of parasite, frequent testing shows



Source: <https://archive.jsonline.com/news/milwaukee/milwaukee-marks-20-years-since-cryptosporidium-outbreak-099dio5-201783191.html/>

Walkerton... 20 years later

This week marks the 20th anniversary of the Walkerton water crisis. In this week's issue of the Herald-Times, we reflect on the horrific tragedy that made more than 2,300 people sick and resulted in seven people losing their lives.

'People were going to die from this'

PAULINE KERR

Local Journalism Initiative Reporter
pkerr@midwesternnews.com

WALKERTON – In many ways, it was the “perfect storm” as far as disasters go – cuts to provincial funding for environmental oversight, inadequate water treatment by system operators with no formal training, a holiday weekend and a well that was vulnerable to contamination – when a severe thunderstorm with heavy rainfall flushed a deadly strain of *E. coli* bacteria into the town's water supply.

While more and more people became ill with cramps and bloody diarrhea, the public was assured the town's water was safe. Assurances continued to be given even the morning of May 21. By noon, however, lab results confirmed the cause of the illness was *E. coli* 0157. A boil water advisory was issued as a precaution. By the evening of May 21, one person had been airlifted to London for medical treatment and hundreds were ill. Everyone's worst fears were realized when the cause of the outbreak was finally determined to be the town's water supply – days after adverse test results were known.

At the height of the crisis, the sound of helicopters going to and from the hospital was as familiar to Walkerton residents as the smell of bleach. At least half of the town's residents had become ill and the death toll rose to seven.

Patrick Raftis, then-editor of the *Walkerton Herald-Times*, and presently a journalist with the *Wellington Advertiser*, recalls that he had been away camping on the long weekend. He listened to the news that night and learned people in Walkerton were getting sick. “I figured the next day we were going to be busy,” he said. An understatement, if there ever was one.



Herald-Times File Photo

Dozens of volunteers helped dole out water at the Walkerton Community Centre in the days following the outbreak of the *E. coli* epidemic in Walkerton. Companies from across the country offered free water to residents.

Mayor Chris Peabody speaks on legacy fund created to commemorate water tragedy

PAULINE KERR

Local Journalism Initiative Reporter

WALKERTON – The 20th anniversary of the water tragedy that forever changed Walkerton was marked quietly, with no ceremony.

Mayor Chris Peabody made a public statement to the people of Brockton about the event that had been planned for May 9 at the Walkerton Heritage Water Garden, followed by tours of the Walkerton Clean Water Centre.

Both are lasting memorials to the tragedy in Walkerton 20 years ago, and both speak to the resilience of the people of this community.

“I'd like to express my support and condolences to all who have suffered because of (the water tragedy),” said Peabody. “We know the pain will never entirely fade, so thank you for your courage and strength. No one in Walkerton was left untouched by the tragedy, and that's why we had planned to commemorate the anniversary with a public event ... The COVID-19 pandemic prevented us from doing that.”

Brockton has moved forward with one key aspect of the commemoration, to set up a new scholarship fund to assist students wanting to pursue careers in environmental protection and clean water management.

Did you know?

E. coli Outbreak 2000
Walkerton, Ontario, Canada

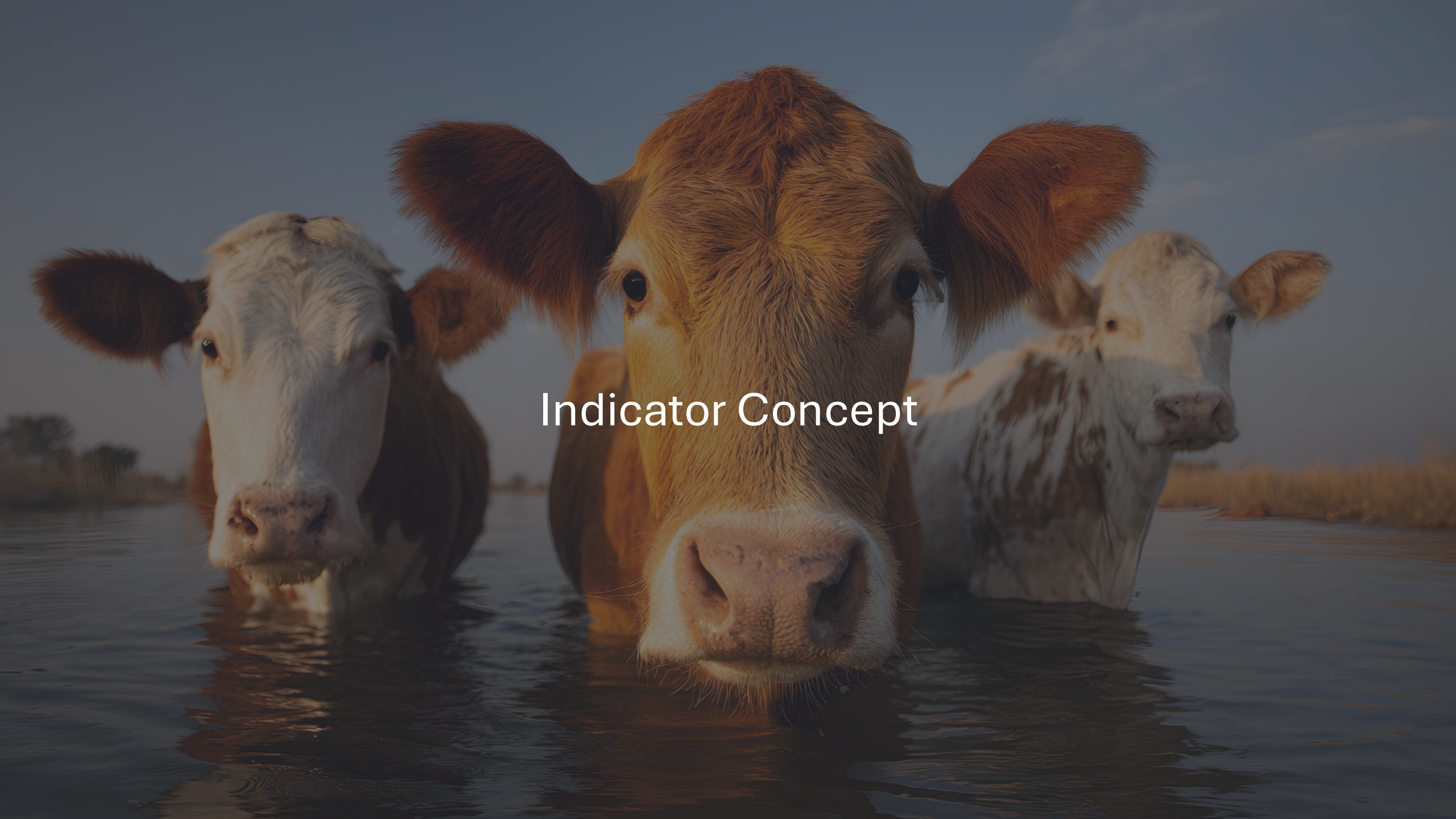
↑ 2,300 people sick

7 deaths

\$1 billion class-action lawsuit

Highlighted the benefits of automation

Source: https://www.ocna.org/uploads/files/2020%20BNC/PC41_2nd_Walkerton%20Herald%20Times.pdf

A photograph of three cows standing in shallow water, likely a river or lake, during the golden hour of sunset or sunrise. The cow in the center is a light brown color with large, upright ears and is looking directly at the camera. To its left is a white cow with brown patches, and to its right is a white cow with brown spots. The water is calm, reflecting the cows and the warm light of the sky. The background shows a distant shoreline with some trees and a clear sky with a few wispy clouds.

Indicator Concept

What makes a good pathogenic indicator for water contamination?

- Absent in uncontaminated waters
- Appears in high numbers when microbial pathogens are present
- Higher rate of survival in water than most pathogens
- Easy and safe to analyze

Indicator Organism



Indicator Concept

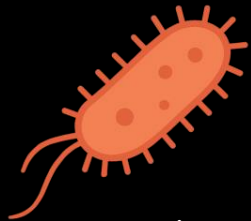


[Bacterial Indicator 2026.mp4](#)

Indicator Concept

Pathogenic (disease-causing) **bacteria:**

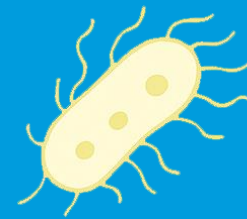
1. Present in very low numbers
2. Difficult to detect
3. Difficult to analyze
4. Testing can be slow and expensive



E. coli O157:H7

Indicator organisms:

1. Found in the presence of pathogens
2. Occur in high numbers
3. Easy and safe to analyze
4. Testing is rapid and inexpensive

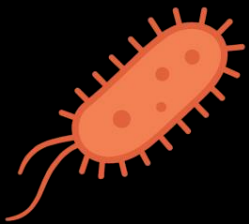


E. coli

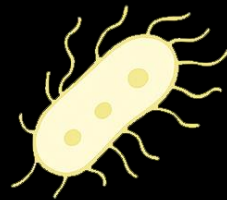
Indicator Concept Example

E. coli 0157:H7 is a common pathogen

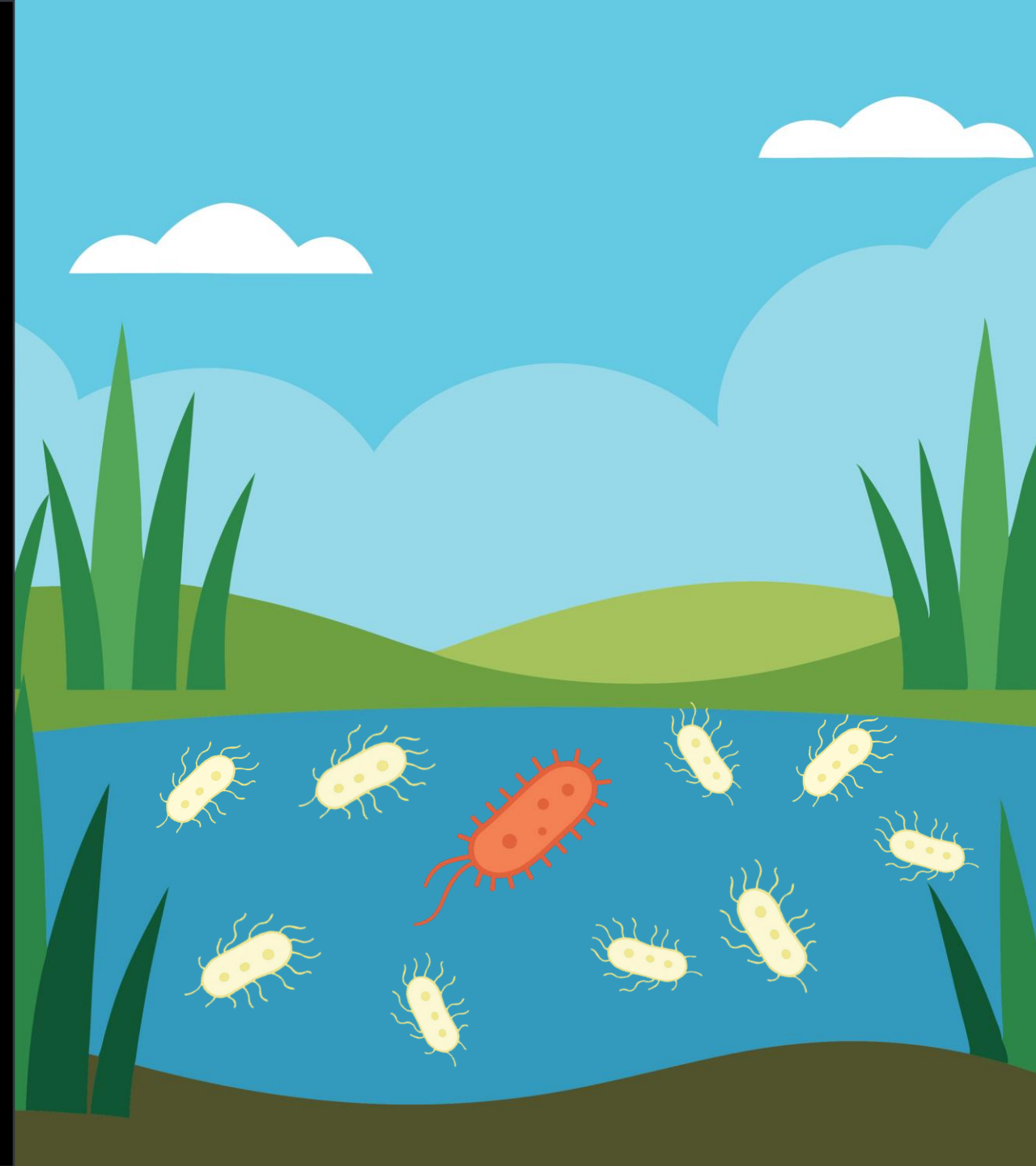
- Enteric, indicating fecal contamination
- Typically found in very low numbers



E. coli O157:H7



E. coli



Why is *E. coli* a good indicator?

E. coli is the predominant bacterial coliform species in fecal material.

Animal	# Tested	<i>E. coli</i>	<i>Klebsiella</i> spp.	<i>Enterobacter/</i> <i>Citrobacter</i>
Human	26	96.8%	1.5%	1.7%
Cow	15	99.9%	-	0.1%
Horse	3	100.0%	-	-
Sheep	10	97.0%	-	3.0%
Pig	15	83.5%	6.8%	9.7%

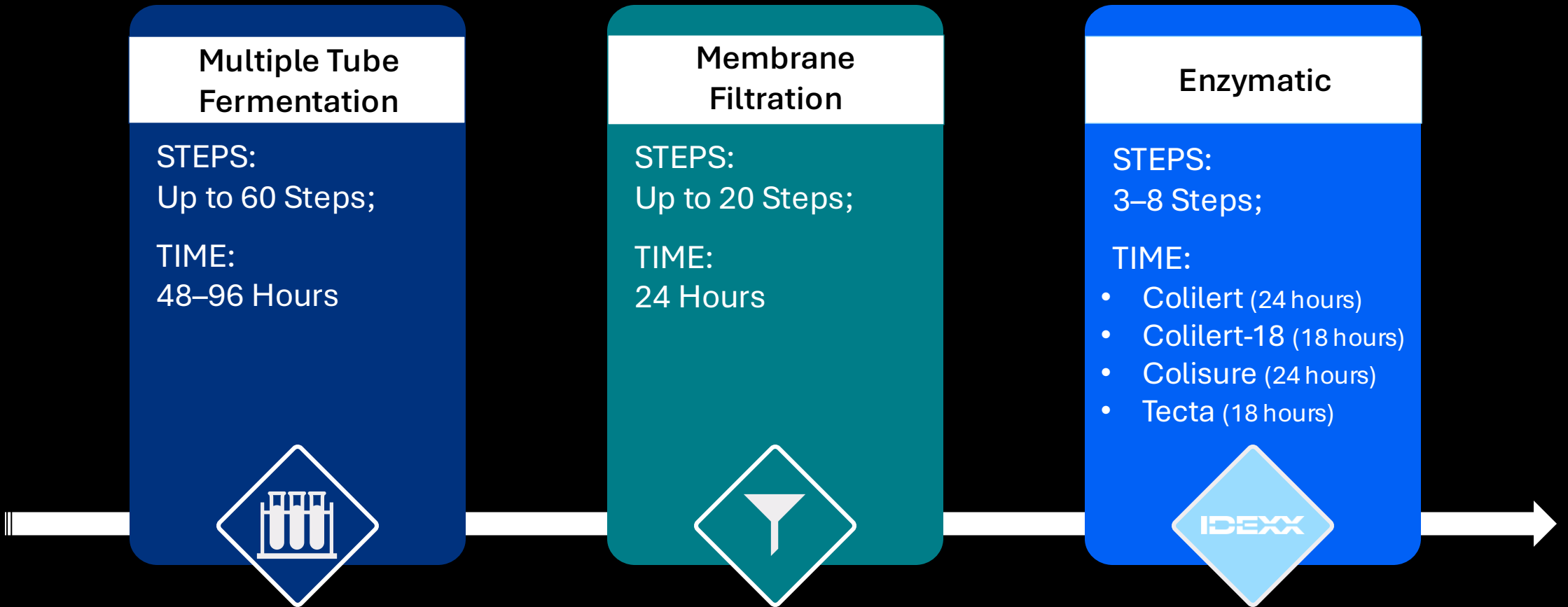
Source: Dufour, A.P. (1977). *Escherichia coli*: The Fecal Coliform. ASTM STP 65, pp. 48–58.

E. coli is present in 95% of all fecal samples studied.



Water Testing

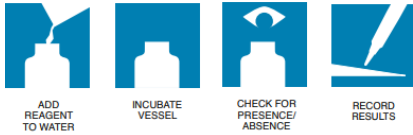
Drinking Water Methods – Evolution



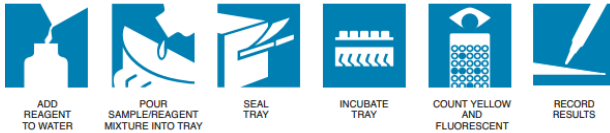
Defined Substrate Technology and Membrane Filtration

Defined Substrate Technology (DST)

PRESENCE/ABSENCE

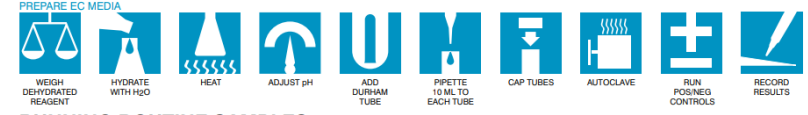
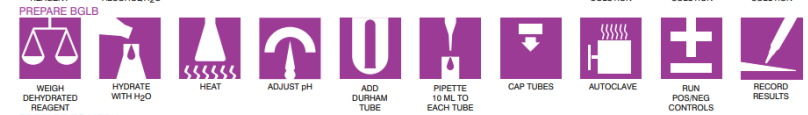
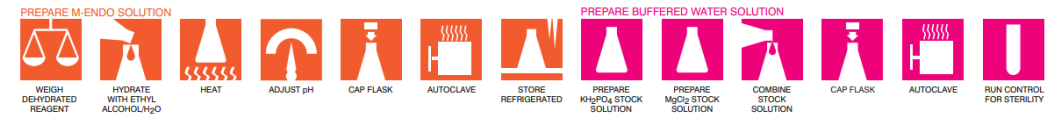


QUANTIFICATION

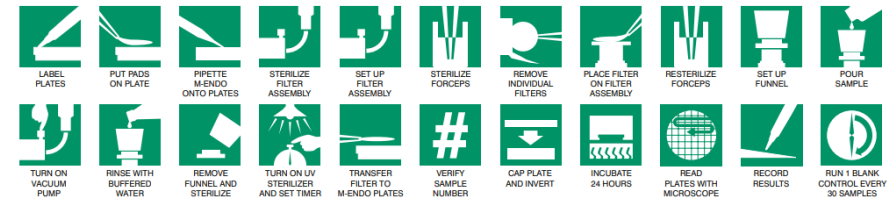


Membrane Filtration (MF)

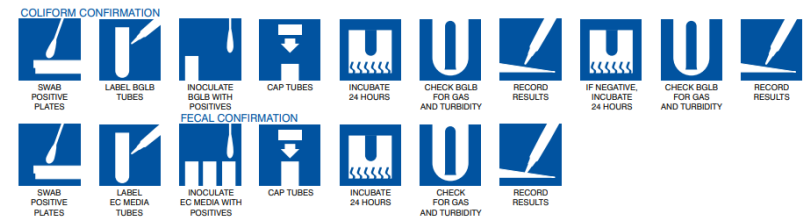
MEDIA PREPARATION



RUNNING ROUTINE SAMPLES



CONFIRMATION TESTING



Presence/Absence (P/A)



vs.

Quantification



Simple Presence/Absence Procedure

Step 1



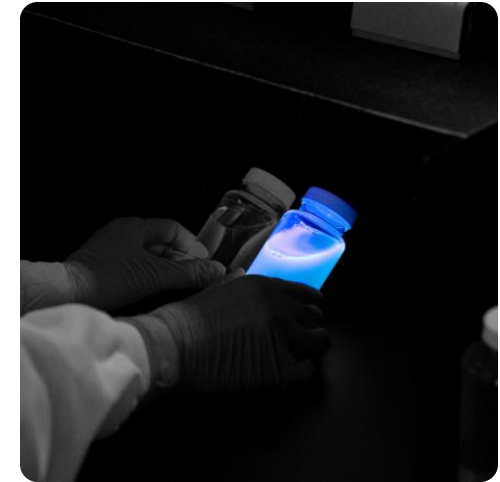
Add reagent to water sample and mix well

Step 2



Incubate vessel

Step 3 & 4



Read and record results

Let us know in the Chat!



What methods does your laboratory currently use for Coliform and *E. coli* detection?

A	Colilert	E	Membrane Filtration
B	Colilert-18	F	Multiple Tube Fermentation
C	Colisure	G	Other
D	Tecta		

A miniature industrial facility, including several tall grey storage tanks and a white dome-shaped structure, is situated on a lush green hill. A small pipe extends from the facility towards a small waterfall. The waterfall flows over a rocky ledge into a pool of water below. The background features a large, leafy tree and distant, hazy mountains under a soft, overcast sky. The entire scene is presented in a soft, slightly desaturated color palette, giving it a dreamlike or conceptual quality.

Enzymatic Testing

Colilert

Total coliform and *E. coli*, 24-hour test

- Flagship product
- First EPA approval in 1989 (*E. coli* added in 1992)
- No confirmation steps
- Unit dose snap pack



EPA-approved, *Standard Methods 9223B*

- Drinking Water*
- Ground Water*
- Recreational Water (fresh)*
- Wastewater (*E. coli*)*



*U.S. Environmental Protection Agency (EPA) approved as a method for total coliform and *E. coli* detection in drinking water and for *E. coli* detection in the following types of waters: ambient waters, surface water, ground water, wastewater.

Colilert-18

Total coliform and *E. coli*, Fecal, 18-hour test

- Faster results
- Thermotolerant (fecal) coliforms
- Marine water applications



EPA-approved, *Standard Methods 9223B, ISO 9308-2*

- Drinking Water*
- Ground Water*
- Recreational Water*
- Wastewater (*E. coli*)*
- Wastewater (Fecal coliforms)*



*U.S. Environmental Protection Agency (EPA) approved for several types of regulated water.

Colilert and Colilert-18: Reading Results

Read *E. coli* under a 6-watt, 365nm UV light



Yellow color = Total coliforms



Fluorescence + Yellow color = *E. coli*

Colilert and Colilert-18: Defined Substrate Technology

Total coliforms

β -galactosidase

ONPG

o-nitrophenyl

β -D-galactopyranoside

Coliforms

β -galactosidase

o-nitrophenol

β -D-galactopyranoside

E. coli

β -glucuronidase

MUG

4-methyl-umbelliferyl

β -D-glucuronide

β -glucuronidase

4-methyl-umbelliferone

β -D-glucuronide

Colisure

Total coliform and *E. coli*

- Longer read window (24–48 hours)
- Distinct magenta color for positive result



EPA-approved, *Standard Methods 9223B*

- Drinking Water*
- Ground Water*



*U.S. Environmental Protection Agency (EPA) approved as a method for total coliforms and *E. coli* detection in drinking water and for *E. coli* detection in groundwater.

Colisure: Reading Results



Magenta color = Total coliforms

Read *E. coli* under a 6-watt, 365nm UV light

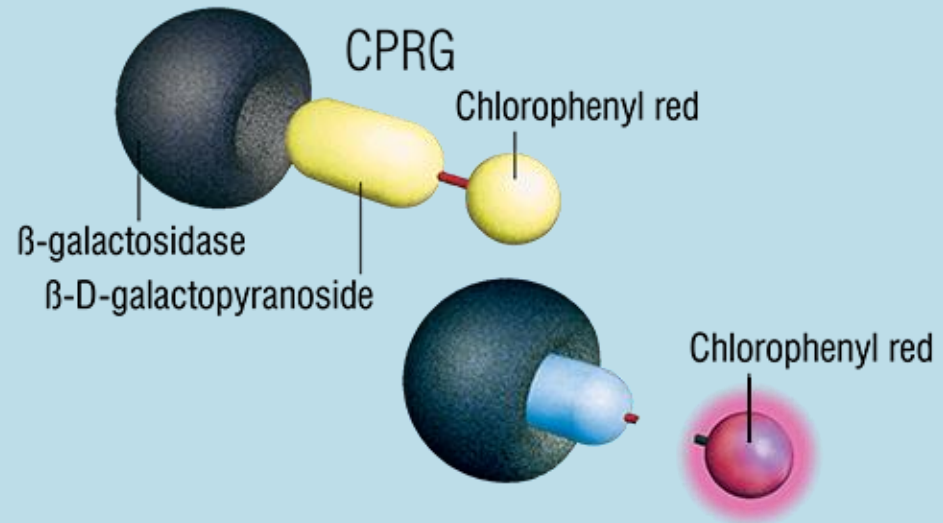


Fluorescence + Magenta color = *E. coli*

Colisure: Defined Substrate Technology

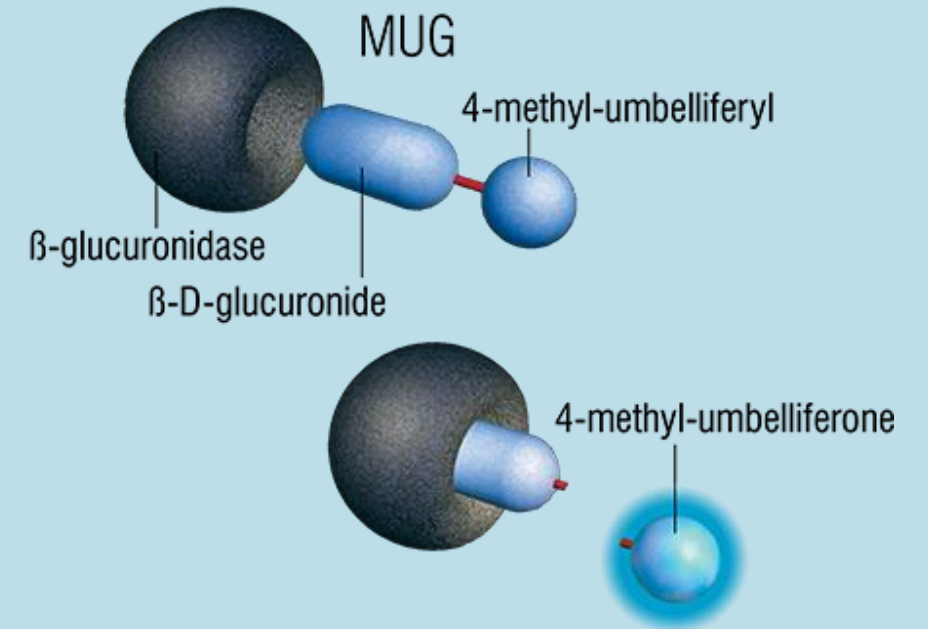
Total coliforms

Coliform



E. coli

E. coli



Tecta

Complete, self-contained water testing system

- Innovation in microbiology
- “Lab in a box”
- Anywhere, anytime, by anyone

Tectalert Tests

- *E. coli* and total coliforms (EC/TC)*
- *E. coli* (EC)
- *Enterococcus* (ENT)
- Fecal coliforms (FC)

EPA-approved

- Drinking Water*

*Tectalert EC/TC medium and Tecta instruments are U.S. EPA approved at 40 CFR Part 141.



Heterotrophic Plate Count (HPC) Tests



Product	SimPlate	EasyDisc PCA	HPC for Quanti-Tray
Water type	• Drinking water • Source water	• Drinking water • Source water	Bottled water (100 mL)
Benefit	EPA approved	Space and time saver	Quanti-Tray platform

SURFACE WATER TREATMENT RULE (SWTR)

As per the 40CFR Part 141.72, surface water systems must provide disinfection at the point of entry whether the water is filtered or not.

The distribution system water must have a detectable level of disinfectant or an HPC level less than or equal to 500/mL.

IDEXX Products Summary for Drinking Water Testing

Total coliform and *E. coli*



Tecta

Heterotrophic Plate Count (HPC)



IDEXX vessels



[idexx.com/vessels](https://www.idexx.com/vessels)

Drinking Water Regulations in United States and Canada

- EPA-regulated
 - Revised Total Coliform Rule (RTCR)
 - Surface Water Treatment Rule (SWTR)
- Health Canada guidance
 - Multi-barrier approach
 - Weekly monitoring for total coliform and *E. coli*



Your Questions Answered

Ask questions in the Q&A tab.





UPCOMING WEBINAR

[How Labs are Using Tecta to Turn Rush Samples Around
in Hours, Not Days](#)

Tuesday, September 15, 2026
1:00 PM EST



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www.linkedin.com/company/idexx-water-testing/

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