What does drinking-water quality mean?

California Water Course

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Prof. Sam Ying – Department of Environmental Sciences – UC Riverside
Samying@ucr.edu

What does drinking-water quality mean?

“Safe” means health-protective for the way people actually use the water.

Clean ≠ Safe

Clean = looks, smells, and tastes acceptable.

Safe = tested and below health-based limits.

Invisible matters

Arsenic, nitrate, lead, PFAS, and pathogens may not change color, taste, or smell.

Context matters

The relevant question is: safe for whom, for what use, over what time period?

Take-home: Water quality is measured, compared to a benchmark, and interpreted in context.

Sources: EPA SDWA; CA State Water Board DDW

1 What Is Drinking-Water Quality?

From source to tap—and beyond what you can see.

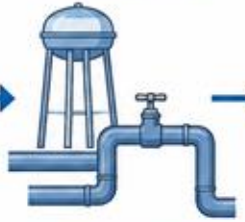
1. SOURCE

Rivers, lakes, groundwater

2. TREATMENT PLANT

Treats and removes contaminants

3. DISTRIBUTION



Pipes carry water to communities

4. YOUR TAP

Water in your home

LOOKS CLEAN

≠

SAFE TO DRINK

CLEAN = What you can see, smell, taste

Clear

No odor

No bad taste

≠

SAFE = What protects your health

Tested

Treated

Below health-based limits

Some contaminants are invisible and odorless.

Examples include:

- As — Arsenic
- NO_3^- — Nitrate
- Pb — Lead
- Microbes (e.g., bacteria, viruses)

Primary vs. secondary contaminants

PRIMARY

Health-based limits

- Regulated because of health risk
- Examples: arsenic, nitrate, lead, E. coli, uranium, PFAS
- Can be acute or chronic
- For public water systems, these are enforceable standards

SECONDARY

Aesthetic / operational

- Taste, odor, color, staining, scaling, corrosion
- Examples: iron, manganese, chloride, sulfate, total dissolved solids (TDS), pH
- May still affect trust, usability, and treatment
- EPA secondary standards are guidelines; states may adopt/enforce them

Important: “secondary” does not mean unimportant — it often determines whether people trust and use tap water.

Sources: EPA Primary & Secondary Drinking Water Regulations; CA MCLs/SMCLs

2 Primary vs. Secondary Contaminants

Two types of standards. Two important roles.

PRIMARY CONTAMINANTS

Health-based • Enforceable

Protects health
Linked to health risk

Enforceable standards
Legally required limits

Examples include:

- As — Arsenic
- NO_3^- — Nitrate
- Pb — Lead
- Microbes (e.g., bacteria, viruses)

Primary standards PROTECT HEALTH.

VS.

SECONDARY CONTAMINANTS

Aesthetic • Non-health-based

Affects acceptability
Taste, odor, color, or appearance

Not health-based
Do not pose a known health risk

Can cause staining
May affect fixtures, laundry, dishes

Examples include:

- Fe — Iron
- Mn — Manganese
- S — Sulfur / Odor
- TDS / Salinity

Secondary standards **AFFECT ACCEPTABILITY AND APPEARANCE.**

Both types of standards work together to deliver drinking water you can trust.

Public water systems vs. private wells

Public water systems

- Serve customers through a regulated system
- Must monitor required contaminants on schedules
- Must report violations and provide Consumer Confidence Reports
- Monitoring usually represents source water, treatment, and distribution — not every household tap every day

Private domestic wells

- Usually the owner's responsibility
- Not routinely regulated like public systems
- Testing is often voluntary or triggered by sale, loan, local program, or concern
- Risk can be highly local: well depth, geology, land use, flooding, septic systems

Equity issue: people on smaller or self-supplied systems often have less routine data and fewer resources to respond.

Sources: CA State Water Board DDW; CA SAFER strategy for domestic wells and state small systems

3 Public Water Systems vs. Private Wells

Different responsibilities. Different protections.

PUBLIC WATER SYSTEMS

Utility is responsible
The water system owns and maintains the source, treatment, and distribution.

Regulated
Must meet federal and state drinking-water standards.

Routine monitoring
Water is tested regularly for many contaminants.

Consumer Confidence Reports
Utilities provide annual reports so you know what's in your water.

PRIVATE WELLS

Homeowner is responsible
You are responsible for maintaining the well and the water quality.

Not regulated like public systems
Private wells are not required to meet federal drinking-water standards.

Testing is not routine
Water is not tested unless the owner chooses to test it.

Water quality can vary
Quality can change over time and may be affected by natural or human activities.

Many people assume all tap water is monitored the same way.
It is not.

What is monitored — and what can be missed?

Commonly monitored in public systems

- Regulated microbial, inorganic, organic, and radiological contaminants
- Disinfectant residuals and disinfection byproducts
- Lead and copper through specific tap-sampling rules
- Treatment performance and operational indicators

Often not fully captured

- Every contaminant, every tap, every day
- Premise plumbing and point-of-use filter performance
- Private wells unless owners test
- Emerging contaminants before rules are adopted
- Short-term spikes from fires, floods, drought, recharge, stagnation, or treatment changes

Question: “Where was the sample taken, when, and what was it tested for?”

Sources: EPA SDWA; CA DDW monitoring and Drinking Water Watch resources

4 What Is Monitored — and What Can Be Missed?

Public water systems monitor many things, but not everything.

WHAT IS MONITORED

Public water systems routinely monitor:

Specific regulated contaminants

Examples: microbes, disinfectants, inorganic chemicals (e.g., lead, nitrate), certain organic chemicals

Treatment and distribution indicators

Examples: chlorine residual, turbidity, pH, conductivity

WHAT IS NOT ALWAYS MONITORED

Not every possible chemical

Utilities test for regulated contaminants, not every chemical that could exist.

Not every household tap

Utilities sample a representative subset of homes, not every tap, every day.

Private wells are not routinely monitored by a utility

Well water testing is the responsibility of the well owner.

Contamination can occur after the water leaves the utility

Lead pipes, fixtures, or cross-connections in home plumbing can affect water quality.

Monitored does not mean everything, everywhere, all the time.

Quality you can trust. Every step. Every drop.

Meet the OtterSampler!

A simple way to learn about your tap water over time

What is it?

The OtterSampler is a small device that collects tiny water samples from your tap over time. This helps us understand how water quality can change from day to day or week to week.

What would I do?

1. Keep the sampler in your home during the sampling period.

2. When it is time to sample, fill a clean cup with tap water.

3. Place the tubing in the cup and press the button to collect the sample.

4. You may also answer a short survey and return the device at the end.

What do I get out of it?

- Learn more about your tap water.
- Help us understand how water quality changes over time.
- Support community efforts to improve water access and information.
- Help identify patterns that one-time testing might miss.

Good to know

- The device is designed to be easy to use.
- It collects small water samples over time.
- The samples are tested later in a laboratory.
- This project helps us better understand water at the tap.

Interested in participating?

Ask the community team how to sign up and learn more.

Together, we can learn more about what is happening at the tap.

OtterSampler

How to Use Your Sampler

OtterSampler makes tap water sampling easy!

Your OtterSampler collects a water sample once a week.
Follow the steps below when the display says it's time!

1 Wait for it to be time

The display will flash and tell you when it's time to take a sample (once a week).

2 Add clean water to your cup

Use a clean cup that you use for drinking water.

3 Place the cup under the tubing and press

Hold your cup up so the tubing is fully in the water. Press the button to collect your sample.

4 Remove the cup and press again

Take the cup away. Press the button again to suck up air and finish.

5 You're all set!

Your sample is saved! The display will show a countdown until the next sample (one week from now).

6 Wait until next time

Come back when the display flashes and it's time to sample again next week!

Scan the QR Code After Every Sample

After every time you sample, scan the QR code on your OtterSampler, visit your unique page and fill out a quick survey.

- How your water looks, smells, and tastes
- Whether you used other water sources
- Comments about the sampler or anything you notice about your water

Helpful Reminders

- Only sample when the display says it is time.
- If it is not time yet, the button is locked.
- Use a clean drinking-water cup.
- Keep the Otterr in a clean, dry place and make sure it stays plugged in.

Questions or Need Help?

We're here for you!

ucragua@gmail.com
(951) 554-1374