

Dedicated sampling taps can save you big headaches



How not to...
Never take your coliform sample from a hose bib, such as this one.

Did you hear about the major water utility that collected a routine coliform monitoring sample from a residential hose bib without knowing that a septic tank pumping service had used it recently?

Or another large utility that had an *E. coli* detection from a sample collected at a hamburger joint?

It's impossible to know how many unsatisfactory sample results can be blamed on poor sample sites. But, it is reasonable to assume that poor sampling sites do account for some unsatisfactory results. Any time you collect a coliform sample where the water flows through internal building plumbing or pipes not under the control of the water system, your chances of having an unsatisfactory sample result increase.

Results of routine and repeat coliform samples really matter. It is important that the sampler has full confidence that the sample location and the sampling device produce results representative of water in the distribution system. The operator must take time to understand the flow characteristics of the site and the maintenance history of the sample station.

Many water systems purchase and install dedicated sample stations on or near a water main so the quality of the water in the service mains or the internal plumbing of buildings does not affect their samples. Purchased dedicated sample stations can be expensive, but they are an excellent way to have a lot of confidence that the water sample results correctly reflect the quality of the water you're providing to your customers.

Some water systems can't afford to install purchased dedicated sample stations and have found less expensive options that work well. Some build their own dedicated sample stations. A dedicated sample tap can be as simple as a length of pipe with a faucet installed near the water main that can be opened to collect a water sample. Some water meters are designed to accommodate a snap-on sampling device. Some operators tap directly into a water meter and install a length of copper pipe used to collect a sample.



Sampling station rods easily thread onto a spring-loaded sampling tap, reducing your chance of obtaining an unsatisfactory water sample.

Photo courtesy of Kupferle

While we don't endorse specific sample station designs, our guidance is clear: Choose a device in which you have full confidence. If you have any questions, call our regional office.

Avoid these sample sites!

- Fire hydrants
- Swivel faucets
- Hot/cold "mixing faucets" (such as faucets with a single lever)
- Drinking fountains
- Janitorial sinks
- Frost-free hose bibs or yard hydrants
- Leaking or spraying faucets
- Faucets below ground or near ground level
- Faucets with filters or other home treatment systems

Collecting representative lead and copper samples

By Sophia Petro, Southwest Region, Water Quality Program Manager

Lead and copper monitoring can be challenging for community water system operators because they usually rely on homeowners to get the samples. It is important for operators to provide precise written and oral sampling instructions so that customers collect samples properly.

Talk to your customers about the samples they collected. See suggested questions in guidance below. If a sample doesn't meet the proper collection criteria, don't send it to the lab. Instead, try again to get an appropriate sample. Keep in mind that you don't have to collect all the samples on the same day. Ask your lab about holding times.

Here are two common errors:

- Samples from a faucet with additional point-of-use or point-of-entry treatment, such as a filter or water softener that can make the water more corrosive.
- Samples from improper locations.

If you have questions about lead and copper monitoring, call the lead and copper program coordinator at our regional office.

Eastern Region, Spokane Valley, 509-329-2100

Northwest Region, Kent, 253-395-6750

Southwest Region, Tumwater, 360-236-3030



Lead and copper sampling guidance

Samples SHOULD BE collected:

- From a regularly used COLD WATER kitchen or bathroom faucet.
- After the water sat unused in the pipes for at least 6 hours (but no more than 12 hours).

Samples SHOULD NOT BE collected from:

- Vacant or periodically unoccupied (vacation) homes. It may be easy to collect the sample, but the stagnant water also makes it very likely to exceed the action level.
- Homes where occupants just returned from vacation. Ask, "Have you used the faucet daily for at least three days in a row?"
- Outside faucets, frost-free faucets or yard hydrants. Ask, "Did you collect the sample from the cold water side of a regularly used kitchen or bathroom faucet?"
- Homes with additional treatment, such as water softeners or filters. Ask, "Is there any additional treatment or filtration in the home or on the sampling faucet?"
- A faucet where the aerator was removed right before collecting the sample. The recently roughed threaded surface can artificially increase the lead or copper content.
- A local business or restaurant. This is fine for a nontransient noncommunity system, but inappropriate for a community system.
- Janitorial sinks. Who drinks from the janitorial sink? This is simply a bad sample location.
- Schools right after holidays or when school is not in session. It's easier to sample when kids are gone, but that doesn't represent normal use.



High 5 Award



When the City of Mercer Island issued two boil water advisories last fall, the headlines focused on the impact on the community and what could be causing the contamination. Behind the scenes, many staff from the city, county, state and other entities labored long hours to bring the advisories to an end.

One group that played a quiet but key role was the staff at Seattle Public Utilities (SPU) Water Quality Lab. The lab is the largest state accredited water utility lab in Washington. It analyzes water samples for all of SPU's wholesale customers, including Mercer Island.

At the height of the advisories, Mercer Island collected 18 samples a day in an effort to pinpoint the source of contamination. To put that into perspective, this was a 30-fold increase in sample analysis for the SPU lab. Mercer Island normally collects 18 samples a month.

"The dramatic increase in water sample analysis was needed in support of

the decision process to lift the advisory and continue monitoring after the event," said Wylie Harper, who manages the lab. "Diligence on the part of the laboratory staff, ranging from tracking chain of custody information to performing all required quality assurance checks, provided meaningful analytical results that were a part of resolving the event."

The lab provided "at cost" analysis as part of their regional monitoring plan. To handle the workload, SPU brought in an additional water quality analyst and administrative staff person on the weekends. They also provided technical support from water quality engineering staff during and after regular business hours. In

addition, SPU's operations staff worked an extra 200 hours during the crisis.

"Normally between October 2014 and now, we would have analyzed about 80 coliform samples," Harper said. "During this period of enhanced monitoring, we've analyzed about 1,020 samples for Mercer Island."



An SPU lab analyst prepares to conduct a membrane filter test in their microbiology section. Photo courtesy of Seattle Public Utilities

The work continues...

Because the source of contamination was never found, Mercer Island continues to collect additional coliform samples so they can react quickly if there's another coliform detection.

The city had 15 samples a day tested from Oct. 2 to Nov. 3, 2014, many from locations beyond their routine sampling sites. The current regimen is 7-8 samples a week.

Stage 2 DBP monitoring update

By Regina Grimm, DBP Lead
Southwest Region

We completed our transition from the Stage 1 to the Stage 2 Disinfection Byproducts (DBP) Rule on October 1, 2013. All water systems required to comply with DBP monitoring have transitioned to their new schedules. However, sampling data indicates that some systems are collecting samples at the wrong sampling site.

Monitoring locations: DBP monitoring is a distribution sampling requirement. To get credit for monitoring and avoid a violation, it is important to use the right sampling location. If you change a monitoring site, let your regional office know and update your DBP Monitoring Plan.

- **Total Trihalomethane (TTHM)** formation increases as water ages, so you should collect samples near the end of the distribution system at or before the last group of customers. Avoid dead-ends without customers, without a blow off, or locations immediately prior to booster disinfection.
- **Haloacetic Acids (HAA5)** increase, peak, and then may decrease as the water ages. It is OK to collect your HAA5 samples at the same sites where you collect TTHM samples. Many systems do. However, if you need to select a new monitoring location for HAA5, we suggest using a site with an average water age, downstream of storage, where there are low but existing disinfectant residuals (at least 0.2

mg/L). Avoid areas with biofilm problems or areas where the residual is less than 0.2 mg/L.

Reduced monitoring: Based on at least one year of Stage 2 DBP monitoring, we are looking at reduced monitoring requirements. You don't have to request reduced monitoring. The WQMS will show a reduced monitoring schedule for systems that qualify, so please check our website.

If you need help, please call our regional office:

Northwest Region: Jolyn Leslie
253-395-6762
Eastern Region: Russell Mau
509-329-2116
Southwest Region: Regina Grimm
360-236-3035

Caution, chemical deliveries

By Mike Stevens, City of Camas Water-Sewer Supervisor, and Janet Cherry, P.E., Southwest Region

Last July, a delivery truck delivered the wrong chemical to the water treatment plant at the City of Camas. This mishap easily could have caused an explosion. The incident occurred following a “perfect storm” of events:

1. Both the water treatment plant and wastewater treatment plant were expecting a chemical delivery. The water plant expected to receive sodium hydroxide and the wastewater plant expected to receive calcium nitrate.
2. The contractor from the chemical company hired to deliver the calcium nitrate to the wastewater plant was not familiar with the City of Camas or the system operators.
3. The contractor began pumping the chemical from the delivery truck before the water plant operator checked the paperwork.

For a brief time, calcium nitrate pumped into a bulk container of sodium hydroxide. Fortunately, the water treatment plant operator acted quickly. As soon as he saw the paperwork, he asked the contractor to stop pumping the calcium nitrate.

Protocol for chemical deliveries

Following this incident, the City of Camas developed a protocol for chemical deliveries. The protocol includes several key procedures you may want to incorporate into your water system’s standard operating procedure for chemical deliveries:

1. All operators need to review the bill of lading from the delivery supplier to verify the correct product is being delivered on every shipment.
2. All connection ports to which the delivery will connect are to be clearly labeled with the chemical name.
3. All chemical tanks and vessels are to be checked for proper labeling.
4. All material safety data sheets (MSDS) will be reviewed and made accessible at the remote sites of the water system (such as well sites) and in the office.
5. If possible, avoid multiple chemical deliveries on the same day.

Additional considerations

In addition to the protocol the City of Camas developed, consider including procedures such as:

1. Notify all operators, both water and wastewater, about all scheduled chemical deliveries.
2. Have an operator on-site for all chemical deliveries.
3. Put a lock on every chemical delivery port to prevent access without the operator present.
4. Provide supports for hoses if spanning a long distance.
5. Provide adequate containment for the chemical delivery area.
6. Provide eyewash and shower facilities for operators and delivery personnel in the event someone is exposed to the chemical.
7. Review these processes regularly with all staff and update as needed.



Bulk sodium hydroxide storage tank with containment and eyewash station.

Improving your sampling routine

By Stan Hoffman, Eastern Region, Source Water Quality Program Manager

Has your phone ever rung late Friday afternoon after you delivered samples to your lab on Thursday? If you've felt the rush of anticipation from having been in that position before, you're not alone.

No matter where we live in Washington, it is never a dull day when we are sampling to meet monitoring requirements. The results of those samples can have a huge effect on your water system and the people we both serve.

Taking the time to evaluate your personal sampling routine for areas of improvement can be beneficial. Here are some important considerations.

Are you prepared?

The bottles needed for collecting various kinds of samples often differ from each other and may contain different preservatives. The sample bottles need to be in good physical condition and you need to have ice ready to cool the samples after you collect them. Paperwork regarding water system identification numbers, sample source location, and composition should be clear.

Is your technique appropriate for the kind of sample you're collecting?

Do you allow enough flush time to get a representative sample? If the sample isn't representative of your water, you may receive different results than you expect. Does your coliform sample have at least 100 mL of water? Is your VOC sample free of air bubbles? When a lab receives samples that weren't collected correctly it can't perform the test you need.

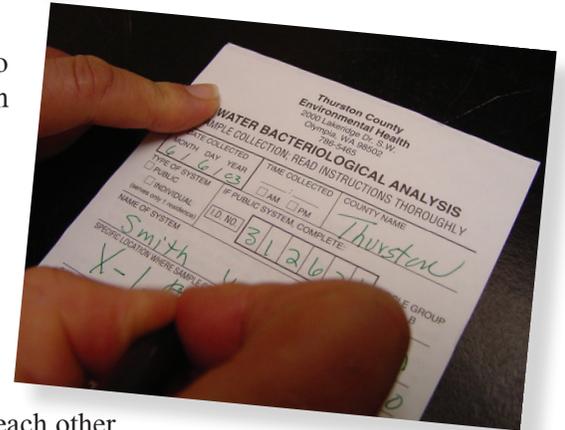
Is the lab prepared for your sample?

Some samples have holding times as short as 30 hours. Others may need a certain chemist to be available to complete the analysis. Communicating with your lab ahead of time will streamline the sample collection and analysis process.

Are you sampling early enough?

Are you sampling early enough in the week, month, and quarter or other compliance period? Sampling early will give you time to make alternate arrangements with your lab or the state if something unexpected happens. This also makes it easier for us to provide technical assistance in cases where results require an immediate response.

Steps and procedures for collecting samples can vary from lab to lab. So, if you have sampling questions, call your lab. If you have questions about requirements, call our regional office.



Coliform monitoring procedure

Follow your Coliform Monitoring Plan to collect routine and repeat samples from sites throughout the distribution system. Sample taps should represent the water in your distribution system. Avoid poor sample sites (see page 1).

Remove attachments from the faucet (aerators, screens, washers, hoses, water filters). If you disinfect the sample site before sampling, flush thoroughly to remove all disinfectant.

Leave the bottle closed. Turn on the cold water only and let it run for at least five minutes. Then turn the water down to a thin stream, and run for one minute. If the system is chlorinated, measure the free chlorine residual and note the measurement on the lab slip.

Open the bottle. Don't rinse it because there may be liquid or powder inside to neutralize chlorine. To avoid contamination, hold the bottle near the bottom with one hand, hold the top of the cap with the other, and then unscrew the cap. Hold the cap with the threads facing down. Do not set the cap down, touch any part of the cap that touches the bottle, or let anything touch the rim of the bottle or the inside of the cap.

Fill the bottle to the neck or indicated fill line and replace the cap. Don't let it overflow or touch the sample tap.

Complete the lab slip. If there was anything unusual about the sample collection, note it on the lab slip. Secure the lab slip to the bottle with a rubber band. Deliver the sample to a certified lab or a designated drop-off location for the lab as soon as possible. Lab analysis must begin within 30 hours of sample collection.

PO Box 47822
Olympia, WA 98504-7822

H2Ops will *always* be available at
<http://www.doh.wa.gov/H2Ops>

DOH 331-500

For people with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TDD/TTY call 711).

Upcoming deadlines

July 1, 2015	Submit Water Use Efficiency Report to us.
July 1, 2015	Send consumer confidence reports (CCR) to customers and us.
October 1, 2015	Submit CCR certification form to us.
30 days after you get your lead and copper sample results	Send lead and copper sample results to the customers who sampled.
90 days after monitoring period ends	Submit certification of customer notification of lead and copper results to us.

We have a publication about that!
Need information on sampling or other drinking water topics? Visit our publications database at
<https://fortress.wa.gov/doh/eh/dw/publications>