

August 2008

DOH 331-411

On-line Turbidity Meters

In surface water treatment plants, you can use a properly calibrated and correctly positioned on-line turbidity meter (also called a “turbidimeter”) to accurately measure the clarity of drinking water and judge the effectiveness of your treatment process.

Your turbidity measurement is important. It tells you how efficiently your filtration is removing pathogens, such as *Giardia* and *Cryptosporidium*, and other particles. Besides indicating potential pathogen breakthrough, high turbidity can interfere with disinfection.

The Department of Health Office of Drinking Water requires most plants to conduct two types of filtered water turbidity monitoring.

1. **Combined:** Blended water from all of the operating filters in a plant.
2. **Individual:** Water produced by one filter.

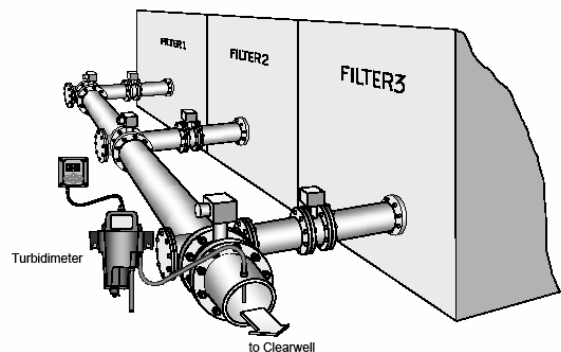
Combined filtered water sampling

You must determine where to collect turbidity samples that represent the quality of the water the system produces. We recommend a point immediately after water from all the filters merge and before the clearwell. This is a *combined filter effluent* sample (CFE).

Because of differences in filter piping and clearwell configuration, the exact location for the most representative sample may vary from plant to plant.

It may be physically impossible to collect a CFE sample in some facilities. This may occur if there is:

- More than one clearwell.
- No common header pipe and each filter empties into the clearwell.



If you can't take a CFE sample, consider these alternatives (in order of preference):

- Take a sample from a line pumped from a representative location within the clearwell.
- Take a sample from any pipe that gets water from the clearwell.
- Take an average of individual filter turbidity readings.
- Report the highest individual filter turbidity.
- Combine the filter turbidity sample lines. Each sample line must have the same flow rate.

Be sure to choose a sampling location that represents the quality of your filtered water. A monitoring violation could occur if you:

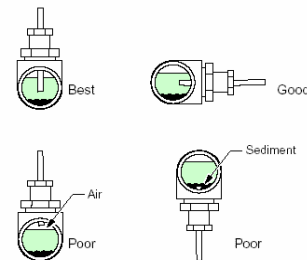
- Fail to perform this monitoring obligation properly.
- Deliberately report data only from sampling sites known to be under the turbidity limits of the rules.

Individual filtered water sampling

Collect turbidity samples for an individual filter from the effluent piping for that filter before it connects with the piping from any other filter. Pick a location with positive flow throughout the range of filter headloss experienced.

Installation Tips

- When you install an on-line turbidimeter, move the signal, not the sample! Put your sensor as close to the sample site as possible. A short sample line lessens the chance for sample deterioration and lets the water you are producing look its best. A few extra feet of wire can bring the recorder signal to a spot convenient for routine monitoring.
- Install a relay to interrupt the signal to the recorder whenever the filters are off-line.
- Use ¼ inch diameter tubing. Smaller tubing improves meter response time.
- Make sure your sample tap projects into the center of the process pipe, avoiding air or sediment (see diagram, right).
- When possible, avoid pumping turbidity samples. Use gravity instead.
- Be sure there is adequate flow to your meter (check the owner's manual).
- Inspect your sample lines quarterly and flush if necessary.
- Be sure to calibrate your turbidimeter on a quarterly basis, or at least as often as recommended by the manufacturer.



For more information

Learn how to check the accuracy of a turbidimeter. Get **Calibrating turbidity meters (331-404)** online at <<https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm>> or by calling (800) 521-0323.

Call the Office of Drinking Water:

Eastern Region – Spokane (509) 456-3115

Northwest Region – Kent (253) 395-6750

Southwest Region – Tumwater (360) 236-3030

