



# Groundwater Sources Under the Direct Influence of Surface Water

331-216 • Revised 12/10/2021

The federal Surface Water Treatment Rule applies to all Group A public water systems (community and non-community) that use:

- ◆ Surface water sources.
- ◆ Groundwater sources under the direct influence of surface water (GWI).

Such sources are vulnerable to microbiological contamination. For most affected systems, the rule requires both filtration and disinfection to control this contamination.

## Definitions and source classification

The federal rule defines groundwater under the direct influence of surface water as—

“Any water beneath the surface of the ground with significant:

- ◆ Occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia*, or
- ◆ Relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH that closely correlate to climatological or surface water conditions.”

GWI means the groundwater source is located close enough to nearby surface water, such as a river or lake, to receive direct surface water recharge. Since a portion of the groundwater source's recharge is from surface water, the groundwater source is considered at risk of contamination from pathogens such as *Giardia lamblia* and viruses, which are not normally found in true groundwater.

Sources most likely to be under the direct influence of surface water are:

- ◆ Infiltration galleries and Ranney wells located near surface waters.
- ◆ Poorly constructed springs.
- ◆ Shallow wells located near surface waters.

## Process for designating sources as GWI

**Records review.** We conduct a records review to identify potential GWI sources. Potential GWI sources are defined as all infiltration galleries, Ranney wells, springs, and wells less than 50 feet deep located within 200 feet of surface water.

**Determination of hydraulic connection.** A water system may either conduct a hydrogeologic investigation or use the water quality monitoring (WQM) method to determine whether the potential GWI source is hydraulically connected to nearby surface water.

The hydrogeologic investigation requires a licensed hydrogeologist; the water quality monitoring method does not. The WQM method requires one year of weekly measurements of temperature and conductivity (or other parameters) at both the source and the surface water. The purveyor must arrange for statistical analysis of the data to determine if there is a correlation between source measurements and surface water measurements. We can help and check the validity of the analysis. If either the WQM method or hydrogeologic investigation indicate a hydraulic connection, the source is designated as groundwater in hydraulic connection with surface water, requiring disinfection and microscopic particulate analysis.

**Microscopic particulate analysis.** The water system collects a sample of source water and sends the sample to a laboratory for a microscopic particulate analysis. If certain numbers or types of surface water organisms are found in the groundwater samples, the source is designated to be under the direct influence of surface water. Such sources are classified as GWI and are subject to the Surface Water Treatment Rule

## Treatment requirements for systems with GWI sources

Water systems with GWI sources must achieve at least 99.9 percent removal or inactivation of *Giardia lamblia* cysts and at least 99.99 percent removal or inactivation of viruses. To accomplish this, systems must do all of the following.

- ◆ Filter, unless certain source quality and site-specific conditions are met to avoid filtration.
- ◆ Disinfect.
- ◆ Be operated by qualified personnel.

## Compliance options

Systems with GWI sources or sources identified by the department as being potential GWI sources have several compliance options to choose from, including:

- ◆ Modify the source to eliminate direct surface water influence.
- ◆ Develop an alternate DOH-approved source (for example, develop a protected groundwater source or purchase from a nearby approved public water system).
- ◆ Attempt to meet the source quality and site-specific criteria to remain unfiltered.
- ◆ Install filtration.

## More information and assistance

Contact our nearest regional office from 8 AM to 5 PM, Monday through Friday. If you have an after-hours emergency, call 877-481-4901.

[Eastern Region](#), Spokane Valley 509-329-2100.

[Northwest Region](#), Kent 253-395-6750.

[Southwest Region](#), Tumwater 360-236-3030.

Our [website](#) provides access to publications on *Cryptosporidium* and other contaminants, information on how to hire an engineer, and many other resources. We include links to other

sites such as the federal Environmental Protection Agency (EPA) and the American Water Works Association (AWWA.)

U.S. Environmental Protection Agency Safe Drinking Water Hotline 800-426-4791.



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