

# Groundwater Under the Direct Influence (GWUDI)

The federal Surface Water Treatment Rule requires that all public water systems that use surface water or use groundwater under the direct influence of surface water meet performance standards of filtration and disinfection to deactivate pathogenic organisms within the water. This requirement is addressed in Oregon Administrative Rule 333-061-0032.

## What is groundwater under the direct influence?

Groundwater under the direct influence (GWUDI) of surface water occurs when, because of its proximity to surface water and the character of the aquifer, pathogenic organisms can move from the surface water source to the well or infiltration gallery.

## What are the public health concerns associated with GWUDI?

Pathogens, such as *Giardia* and *Cryptosporidium*, are often found in surface water and can cause gastrointestinal illness and other health risks. In many cases, this water needs to be filtered and disinfected through the use of additives such as chlorine to inactivate (or kill) microbial pathogens.

*Cryptosporidium* is a significant concern in drinking water because it is resistant to chlorine and other disinfectants and it's responsible for waterborne disease outbreaks that have caused severe illness. It may be especially harmful to people with weakened immune systems (e.g., infants and the elderly) and potentially fatal in people with severely compromised immune systems (e.g., cancer and AIDS patients).

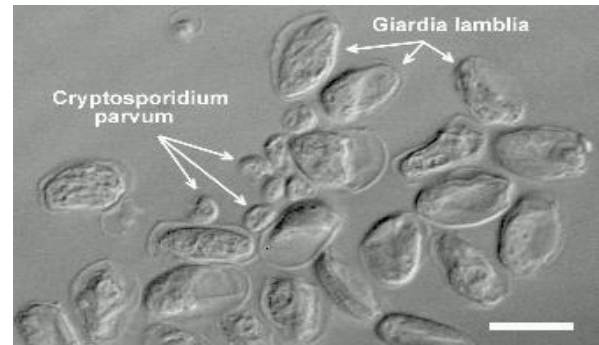
In the photomicrograph on the top right of this page, *Giardia* and *Cryptosporidium* are shown as seen through a microscope. These organisms are very small. The white bar in the diagram is approximately 10 microns (0.0004 inches) in length.

**Fact sheets on *Giardia* and *Cryptosporidium* are available at:**

[https://www.cdc.gov/cryptosporidium/about/?CDC\\_AAref\\_Val=https://www.cdc.gov/parasites/crypto/](https://www.cdc.gov/cryptosporidium/about/?CDC_AAref_Val=https://www.cdc.gov/parasites/crypto/)

**For more information on GWUDI please see:**

<https://www.oregon.gov/oha/PH/HealthyEnvironments/DrinkingWater/Operations/Pages/gwudi.aspx>



Because of their small size, *Giardia* and *Cryptosporidium* can readily move through the open spaces in the aquifer, i.e., through the openings between sand and gravel size particles or in fractures in bedrock. However, the farther they travel the more likely it is that they will be filtered out of the water by natural processes. Through previous studies, scientists believe that the risk related to these organisms is substantially reduced after travel of 200 feet in sand and gravel and after 500 feet in fractured bedrock or layered volcanic rocks.

## What's involved in determining GWUDI?

Analysis of water for *Giardia* or *Cryptosporidium* is complex and costly. The EPA has indicated that monitoring source water for coliform bacteria may serve as a useful surrogate for the other pathogens. If your source is in proximity to a surface water source and meets the hydrogeologic setting-surface water setback criteria listed in OAR 333-061-0032 (7)(a), OHA-DWS requires monthly coliform testing at the wellhead of the source for a period of up to 12 months. If at any time the system fails to monitor or it experiences a confirmed positive *E. coli* test, the water system is required to have two microscopic particulate analyses (MPAs) performed on the source water. For additional information, see [MPA Fact Sheet](#).