

## Question & Answer:

# What is the Ground Water Rule?

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### What is the Ground Water Rule?

The U.S. Environmental Protection Agency (EPA) proposed the Ground Water Rule (GWR) to protect the public from pathogen contamination in systems that use groundwater. Pathogens are microorganisms, such as bacteria (*E Coli*), viruses, and protozoa, such as *Cryptosporidium* and *Giardia lamblia*. Essentially, the GWR aims to identify operating deficiencies in water systems and requires them to do more frequent monitoring.

The GWR applies to all systems using groundwater, and it takes a targeted, risk-based approach. There are no mandatory disinfection requirements, but the rule does build on existing state programs and provides flexibility in defining significant deficiencies.

A significant deficiency refers to a problem that could have immediate potential to affect human health. Some possible examples include:

- maximum contaminant level violations,
- not enough chlorine contact time,
- insufficient water for normal demand,
- not enough disinfectant residual to meet the minimum requirement, or
- no licensed operator for the water system.

Under this rule, primacy agencies must complete a sanitary survey of treatment plants that identifies any problems that could cause contamination. A hydrogeology sensitivity assessment must also be completed to determine the groundwater's vulnerability to contamination. For those systems that use groundwater and that do not disinfect, the rule requires continuous

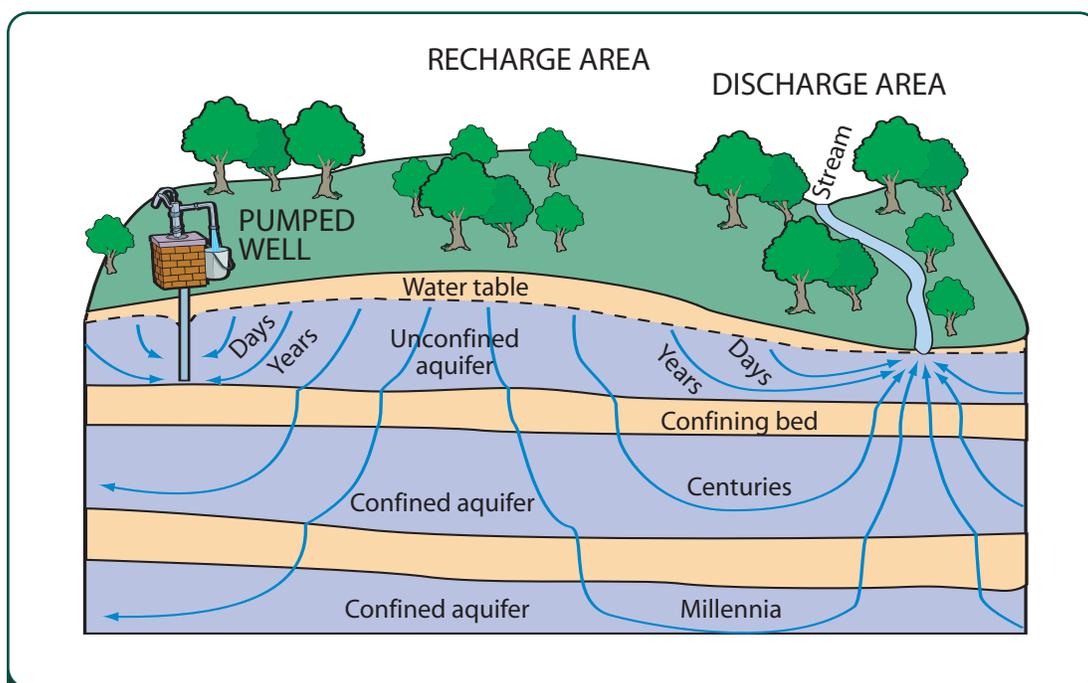
monitoring for susceptible systems. For systems that disinfect, a 4-log (99.9 percent) inactivation of viruses should be demonstrated.

### What are the relevant dates?

EPA started working on this rule in 1999 and proposed it in May 2000. The final Ground Water Rule was supposed to become effective in March 2003. However, the effective date of this rule is still being anticipated.

### Why is EPA proposing this rule?

Historically, groundwater has been considered to be pathogen free, but research indicates that some groundwater sources are contaminated. Presently, only those systems that use surface water (rivers, lakes, creeks, and streams) as a source or systems using groundwater under the direct influence of surface water (GWUD-ISW) are required to disinfect. The 1996 amendments to the Safe Drinking Water



**Figure 1** Flow of groundwater through aquifers

Act require EPA to develop disinfection regulations for groundwater systems “as necessary” to protect the public health.

Research data from the Centers for Disease Control and Prevention (CDC) showed that there were 318 waterborne disease outbreaks associated with groundwater systems between 1971 and 1996. Eighty-six percent of these outbreaks were associated with contaminated source water, and half of those outbreaks occurred in systems that were already using some kind of disinfection. This data indicated a need to strengthen monitoring, prevention, inactivation, and removal of contaminants from groundwater systems.

### **How is groundwater contaminated?**

Intestines of warm-blooded animals, including humans, contain pathogens, such as viruses, bacteria, and *E. Coli*. Fecal matter can enter water through runoff in rainfall and enter surface water sources. Groundwater travels within the surface of the earth through geologic formations or channels called aquifers. Surface water containing pathogens can enter groundwater through cracks in the layers of earth that lead to aquifers. But there are a num-

ber of other ways that groundwater can become contaminated, such as failing septic systems, cracked well casings, or improperly grouted wellheads. In addition, leaking sewer lines also may cause contamination.

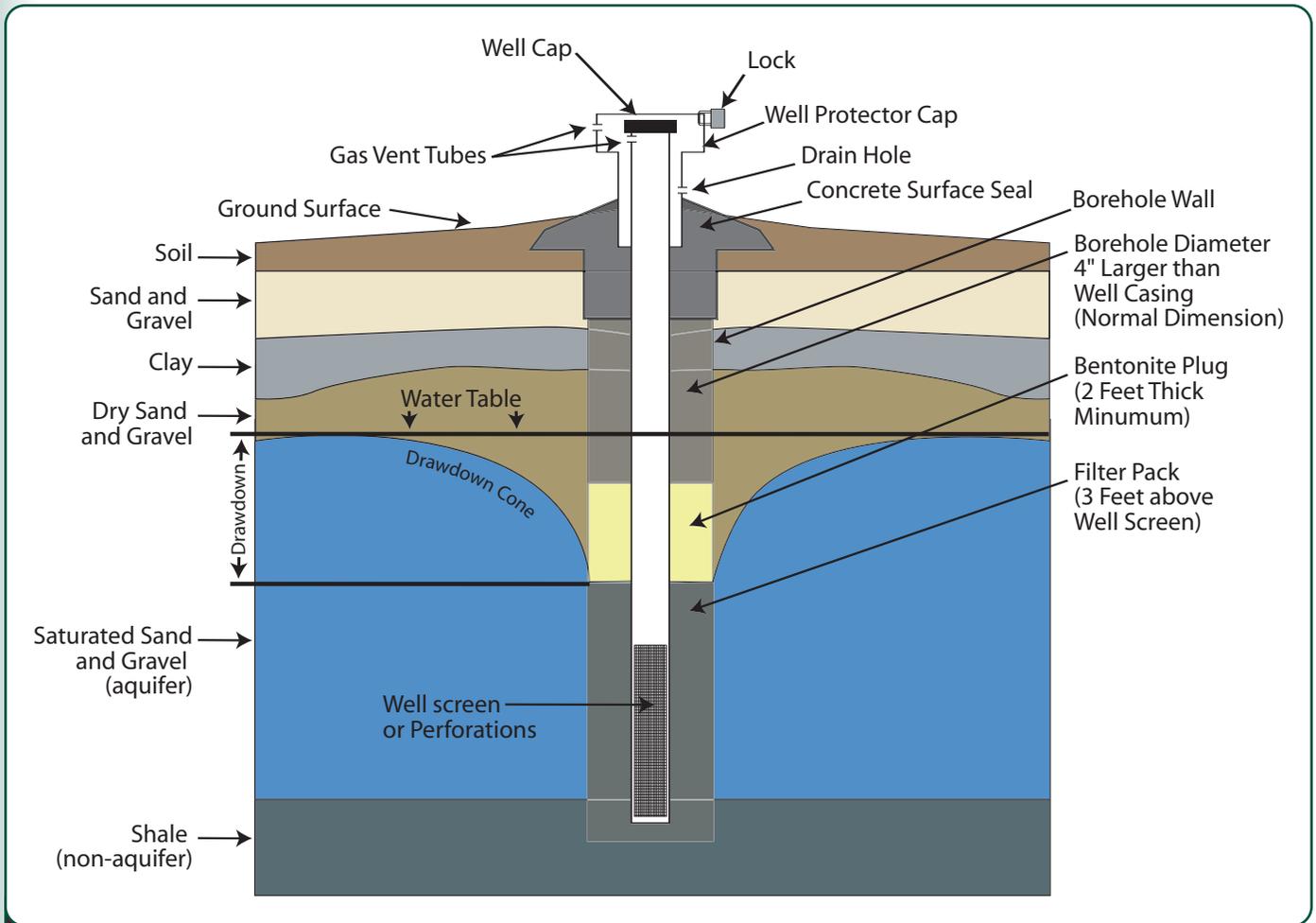
### **What are the health effects of these pathogens?**

Exposure to microbial contaminants can cause gastrointestinal illness, including diarrhea, vomiting, abdominal pain, muscle weakness, and body pain. The illness can last for a few days to several weeks and may result in death for those with weakened immune systems.

### **How many water systems are affected?**

In the U.S. there are 165,000 public water systems. These include community water systems, non-community water systems, and non-transient non-community water systems. Out of these 165,000, about 145,000 systems use groundwater and the majority of them are small systems. The rule applies to all water systems serving 25 people or more for at least 60 days in a year.

# All you have to do is **ASK!**



**Figure 2** Cone of depression around a well.

### ***How did EPA arrive at this rule?***

EPA published the rule in the Federal Register, invited comments, conducted stakeholder meetings, and incorporated public comments.

### ***What requirements are proposed in the GWR?***

Some of the key provisions of the GWR are:

- Using sanitary surveys to help determine system deficiencies and having systems take corrective actions. Eight elements should be evaluated: source, treatment, and distribution; finished water storage; pumps, pump facilities, and controls; monitoring, reporting, and data verification; system management and operation; and operator compliance.
- Requiring hydrogeologic sensitivity assessments for systems that do not disinfect their water. Some aquifers are more susceptible to water enter-

ing them through fractures in subsurface geology. Sensitive aquifers include karst geology, gravel, fractured bedrock, or any other vulnerabilities that the state identifies. States must complete a sensitivity assessment by the sixth year (CWS) and eighth year (NCWS) after the rule promulgation date.

- Requiring monitoring for those systems that do not disinfect and are susceptible to contamination as determined by hydrogeologic assessment. If a system detects contamination, however, it must continue monitoring. These systems can discontinue monitoring if 12 successive samples are negative. This stipulation also applies to systems that do not provide 4-log treatment or draw water from state-determined hydrogeologically sensitive sources. Such systems must collect monthly samples for at least a year. The state may reduce monitoring requirements to quarterly or waive them altogether if a system

## Where can I find more information?

EPA offers a number of Web pages that help explain the GWR.

[www.epa.gov/safewater/gwr.html](http://www.epa.gov/safewater/gwr.html)

[www.epa.gov/safewater/gwr/gwrfs.html](http://www.epa.gov/safewater/gwr/gwrfs.html)

[www.epa.gov/safewater/gwr/gwr\\_ria.pdf](http://www.epa.gov/safewater/gwr/gwr_ria.pdf)

For more information about groundwater, microbiology, and wells, go to *On Tap Online* for articles related to these topics.

### Related Products Available from NESC

#### Manual of Individual and Non-Public Water Supply Systems

Of the thousands of individual and small, non-public water systems in the U.S., many don't have the technical and information resources to meet their customers' demands. This manual provides an overview of individual and non-public water systems and includes information about selecting and managing a water source, water treatment, pumping, distribution, and storage.

DWBKDM06/Book: 188 pp. (1991)

U.S. EPA

#### Groundwater and Surface Water: A Single Resource

Nearly all surface water features interact with groundwater. This illustrated book gives an overview of the relationship between groundwater and surface water. It is intended to help build a foundation for policies governing the management and protection of aquifers and watersheds.

DWBKPE115/Book: 84 pp. (1999)

U.S. Geological Survey

#### Home Water Treatment Units: Filtering Fact From Fiction

Produced to respond to the public's request for information, this brochure discusses the proper use of home water treatment units, the misconceptions about unit approval, possible false or misleading promotions, and references to help consumers make informed decisions.

DWBRPE03/Brochure: 2 pp. (1990)

U.S. EPA

#### Proposed Ground Water Rule: Questions and Answers

The EPA proposed to further protect U.S. drinking water by requiring action to protect groundwater sources from disease-causing viruses and bacteria. This factsheet helps people learn more about groundwater protection and how this rule contributes to better public health.

DWFSRG60/Fact sheet: 3 pp. (2000)

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continually meets monitoring requirements. The rule requires continuous monitoring if fecal indicators (*E. coli*, *enterococci*, or *coliphage*) are found in the source water.

### Is source monitoring required?

Under the Total Coliform Rule, a positive total coliform sample triggers source water monitoring. Systems must collect and analyze source water samples within 24 hours of the positive total coliform notification.

Corrective action is required if fecal indicators (*E. coli*, *enterococci*, or *coliphage*) are found in the source water.

### What corrective actions are necessary?

Systems with a significant deficiency or contaminated source water must correct the problem within 90 days by either changing the source, or installing a treatment process that reliably achieves 4-log removal or inactivation of viruses.

### Are there special provisions for smaller systems?

For systems that disinfect, those serving less than 3,300 must monitor disinfection treatment once daily, while systems serving 3,300 or more people must monitor their disinfection treatment continuously.



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