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HTRW CX Regulatory Fact Sheet FY10-01

Ground Water Rule (GWR)

Purpose: The Ground Water Rule (November 8, 2006, 71 Federal Register 65574 as amended by November 21, 2006, 71 FR 67427) was put in place to increase protection against microbial pathogens in ground water used for drinking water. Though the rule was finalized in 2006, it contains some December 2009 deadlines. The purpose of this fact sheet is to summarize key components of the rule to alert readers of the Federal requirements and to encourage coordination with States to ensure continued compliance.

Applicability: This rule applies to all classifications of public water systems (PWSs) that use ground water sources for drinking water[1]. That includes community water systems; non-transient non-community water systems; and transient non-community water systems. It even applies to consecutive systems - systems that receive finished ground water from another PWS. Affected systems are referred to as ground water systems (GWSs). Even relatively small GWSs, for example a well serving a small campground, may be affected by this rule. The key to determining whether the rule applies is dependent upon whether the system meets the definition of a PWS and whether that PWS uses ground water.

The technical definition of a PWS, as defined in 40 CFR 141.2, is:

> "a system for the provision to the public of water for human consumption through pipes or, after August 5, 1998, other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year. Such term includes: any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Such term does not include any "special irrigation district." A public water system is either a "community water system" or a "noncommunity water system."

More simply, this rule applies to GWSs serving as few as 25 people for at least 60 days per year or as few as 15 service connections.

[1] There is an exception for PWSs that combine all of their ground water with surface water or with ground water under the influence of surface water prior to treatment as required under the Surface Water Treatment Rule.

Background: Under the Safe Drinking Water Act Total Coliform Rule (TCR), distribution systems have long been monitored for microbial contamination. However, until the GWR, no Federal regulation required monitoring of microbial contamination in the ground water source, nor did Federal regulation require corrective action upon discovery of microbial contamination in the ground water. This has been changed by the GWR. Specifically, the GWR seeks to reduce the risk of illness from fecal contamination, bacteria, and viruses by ensuring identification of susceptible ground water systems, monitoring of the source water where necessary, institution of corrective actions or treatment to address problems, and monitoring of treated ground water to ensure the treatment is effective. The GWR also includes a public notice component to alert consumers of problems.

Key Points of the Rule: Rather than requiring all GWSs to be disinfected, this rule uses a risk-targeted approach as discussed below.

Sanitary Surveys

Under the GWR, States must conduct sanitary surveys. This involves an onsite review of the water source, facilities, equipment, operation, maintenance, monitoring to evaluate the adequacy of the system, and operator compliance with State requirements. The surveys identify defects in design, operation, or maintenance, or a failure or malfunction of the treatment, storage, or distribution systems that have the potential to cause the introduction of contamination into the water delivered to consumers. See Attachment A for details of significant deficiencies. If a GWS is notified by the State of a significant deficiency, corrective action is required.

Assessment Source Water Monitoring

States can target higher risk GWSs for additional testing. If directed by the State, GWSs must conduct "assessment source water monitoring" to evaluate the ground water. The State will determine the monitoring requirements. These may include:

(1) Collection of a total of 12 ground water source samples that represent each month the system provides ground water to the public,

(2) Collection of samples from each well unless the system obtains written State approval to conduct monitoring at one or more wells within the ground water system that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting,

(3) Collection of a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used,

(4) Analysis of all ground water source samples for the presence of *E. coli*, enterococci, or coliphage,

(5) Collection of ground water source samples at a location prior to any treatment of the ground water source unless the State approves a sampling location after treatment, and

(6) Collection of ground water source samples at the well itself unless the system's configuration does not allow for sampling at the well itself and the State approves an alternate sampling location that is representative of the water quality of that well.

Triggered Source Water Monitoring

GWSs that do not provide at least 4-log (99.99%) treatment[2] of viruses must conduct "triggered source water monitoring" if notified that the distribution system has tested positive for coliform (unless the sample is found to be an invalid result).

Generally, "triggered source water monitoring" requires the GWS to quickly collect ground water samples to evaluate whether the source of microbial contamination is in the ground water. See 40 CFR 141.402 for specifics regarding triggered source water monitoring.

Corrective Action/Treatment

GWSs in need of corrective action because of a significant deficiency found during a sanitary survey or because fecal contamination has been indicated through analytical results will be notified by the State. Unless the State directs a specific corrective action, the GWS must consult with the State within 30 days of receiving written notice from the State and must implement one of the following corrective action options:

- correct all significant deficiencies;
- provide an alternate source of water;
- eliminate the source of contamination; or
- provide treatment that reliably achieves at least 4-log treatment of viruses before or at the first customer.

Each of these corrective actions is capable of removing all or nearly all fecal contamination, including both viral and bacterial pathogens.

Compliance Monitoring

Ground water systems that provide at least 4-log treatment of viruses before or at the first customer can be relieved from conducting "triggered source water monitoring" if they notify the state of the treatment. Instead of monitoring the source, the GWS conducts "compliance monitoring" to demonstrate the treatment being used is effective. See 40 CFR 141.403(b) for details of compliance monitoring. For example, GWSs using chemical disinfectants must monitor water for minimum disinfectant residual concentrations, however, monitoring requirements vary depending upon the population served.

New Sources

New sources are those placed into service after November 30, 2009. Prior to placing a new source into service, "assessment source water monitoring" must be conducted if directed by the State. New ground water sources that provide at least 4-log treatment of viruses must notify the state and conduct "compliance monitoring" within 30 days of being placed in service. However, if the system subsequently discontinues treatment, then source water monitoring is required. This may be "assessment source water monitoring" if imposed by the State or "triggered source water monitoring" if the distribution system tests positive for coliform.

[2] 4-log treatment of viruses can be attained using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal.

Public Notification

Public notice is required of fecal indicator-positive sample results and of failure to meet monitoring requirements. See 40 CFR 141.202, 40 CFR 141.203, and 40 CFR 141 Appendix A and B for details of public notice requirements.

Important Dates:

- November 30, 2009 - New GWSs placed into service after this date and which do not provide at least 4-log (99.99%) treatment of viruses, must conduct "triggered source water monitoring" if coliform is detected in the distribution system (unless the sample is found to be an invalid result).
- November 30, 2009 - New GWSs placed into service after this date and which provide at least 4-log treatment of viruses, must notify the State regarding the treatment and must conduct compliance monitoring to ensure treatment is effective.
- December 1, 2009 - Deadline for GWSs to notify the State in writing if the GWS provides at least 4-log (99.99%) treatment of viruses[3] before or at the first customer. This notice is necessary in order to avoid "assessment source water monitoring" and/or "triggered source water monitoring". Compliance monitoring is still required.
- December 1, 2009 - Compliance date for triggered source water monitoring. GWSs that do not provide at least 4-log treatment of viruses should be poised to quickly sample the ground water source in the event the distribution systems test positive for coliform.
- December 1, 2009 - Deadline for conducting compliance monitoring to demonstrate treatment effectiveness. This pertains to GWS that are providing at least 4-log (99.99%) treatment of viruses using chemical disinfection, membrane filtration, or a State-approved alternative treatment technology.
- December 31, 2012 - Date by which States must complete initial sanitary surveys for community water systems[4] except those that meet performance criteria. This is repeated every 3 years.
- December 31, 2014 - Date by which States must complete initial sanitary surveys for non-community water systems[5] and community water systems that meet performance criteria. This is repeated every 5 years.
- Upon notification from the State of a significant deficiency, corrective action must be completed within 120 days (or earlier if directed by the State).

State Implementation: States authorized to implement the Safe Drinking Water Act program are specifically required to adopt provisions of the Federal GWR. However, individual state regulations should be consulted to determine any additional, more stringent requirements.

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[3] Treatment can be accomplished via using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal.

[4] A Community Water Systems is a public water system which serves at least 15 service connections used by year round residents or regularly serves at least 25 year-round residents.

[5] A Non-Community Water System is a public water system that is not a community water system and is either a transient or non-transient.

Example #1

A ground water well is used to supply drinking water at a campground. Water flows from the wellhead to a well house where it is chemically treated for disinfection purposes. It then flows to campgrounds where it is available via spigots, water fountains, and water hookups. Because this is a campground, the system serves more than 25 individuals for more than 60 days per year, but does not serve year-round residents, nor does it serve the same individuals more than 6 months of the year.

1. Is this a PWS?
Yes - it is a PWS and more specifically, it is a transient non-community water system.

2. Does the distribution system need to be tested for coliform?
Yes. The Total Coliform Rule is a long-standing requirement applicable to public water systems. Coliform testing should have been occurring routinely for several years.

3. Does the GWR apply to this system?
Yes. It applies because it is a PWS and because it uses ground water and is not excepted.

4. Does the GWS need to notify the State by December 1, 2009 if it is providing 4-log treatment?
If the chemical treatment provides 4-log treatment, State notification is required in order to avoid becoming subject to source water monitoring requirements (either "assessment source water monitoring" at the discretion of the State or "triggered source assessment monitoring" in the event coliform is detected in the distribution system.

5. Presuming the treatment meets the 4-log treatment standard, does the GWS need to conduct "compliance monitoring"?
Yes, compliance monitoring is required by December 1, 2009.

6. If all distribution system samples test negative for coliform, is triggered source water monitoring required?
No.

7. If the distribution system tests positive for coliform, is triggered source water monitoring required? Not typically. Because water is being treated, even if the source is contaminated, the treatment should be addressing the contamination. Coliform in the distribution system would indicate either a problem with the treatment effectiveness (and this should be detected via compliance monitoring) or a problem somewhere within the distribution system after treatment. The State will work with the GWS on assessing what corrective action is required.

8. Is public notice required?
Yes.

Example #2

A campground operates a ground water well used to supply drinking water. No treatment is occurring. The system serves more than 25 individuals for more than 60 days per year, but does not serve year-round residents, nor does it serve the same individuals more than

6 months of the year.

1. Is this a PWS?
Yes. It is a transient non-community water system.

2. Does the distribution system need to be tested for coliform?
Yes. The Total Coliform Rule is a long-standing requirement applicable to public water systems. Coliform testing should have been occurring routinely for several years.

3. Does the GWR apply to this system?
Yes. It applies because it is a PWS and because it uses ground water and is not excepted.

4. Does the GWS need to notify the State by Dec 1, 2009 that it is providing 4-log treatment?
No because no treatment is occurring.

5. If all distribution system samples test negative for coliform, is triggered source water monitoring required?
No, because the requirement has not been triggered.

6. If the distribution system tests positive for coliform, does the ground water have to be sampled? Yes and typically within 24 hours of receiving notification.

7. If the ground water monitoring indicates fecal contamination, then what?
Corrective action must be implemented. If State does not impose a specific corrective action, then coordination with the state is required within 30 days and corrective action would be one of the following: correct all significant deficiencies; provide an alternate source of water; eliminate the source of contamination; or provide treatment that reliably achieves at least 4-log treatment of viruses before or at the first customer.

8. If 4-log treatment is implemented as the corrective action, such as chemical disinfection to inactivate the microbial contamination, then what is required?
Compliance monitoring is required to ensure effectiveness of the treatment process. Residual disinfectant level are monitored to ensure effectiveness.

9. Is public notice required? Yes.

Example #3

A ground water well is used to water grass. It is unusual that anyone would ever drink the water, but it is possible.

1. Is this a PWS?
No, the system is does not meet the definition of a PWS because it is not a "system for the provision to the public of water for human consumption and does not serve at least 25 people at least 60 days per year.

2. Does the distribution system need to be tested for coliform?
No. This requirement applies to PWS.

3. Does the GWR apply to this system?
No because it is not a PWS.

Attachment A - Sanitary Survey Significant Deficiencies

Significant deficiencies may include, but are not limited to, deficiencies in eight key operational areas:

- *Source*
  - Well near a source of fecal contamination (*e.g.*, failing septic systems or a leaking sewer line).
  - Well in a flood zone.
  - Improperly constructed well (*e.g.*, improper surface or subsurface seal).
  - Spring boxes that are poorly constructed and/or subject to flooding.
- *Treatment*
  - Inadequate application of treatment chemicals (*e.g.*, disinfection contact time is inadequate).
  - Lack of redundant mechanical components where disinfection is required.
  - Unprotected cross-connections with treatment chemical systems.
  - Inadequate treatment process monitoring.
- *Distribution System*
  - Negative pressures that could result in the entrance of contaminants.
  - Inadequate disinfectant residual monitoring, when required.
  - Unprotected cross-connections.
- *Finished Water Storage*
  - Inadequate internal cleaning and maintenance of storage tanks.
  - Lack of proper screening of overflow pipes, drains, or vents.
  - Storage tank roofs or covers need repair (*e.g.*, holes or hatch of improper construction).
- *Pumps, Pump Facilities, and Controls*
  - Inadequate pump capacity.
  - Inadequate maintenance.
  - Inadequate/inoperable control system.
- *Monitoring, Reporting, and Data Verification*
  - Failure to properly monitor water quality.
  - Failure to meet reporting requirements.
  - Inadequate recordkeeping.
- *System Management and Operation*
  - Failure to meet water supply demands/interruptions to service (*e.g.*, unreliable water source or lack of auxiliary power).
  - Lack of approved emergency response plan.
  - Inadequate follow-up to deficiencies noted in previous assessment/survey.
- *Operator Compliance with State Requirements*
  - Operator is not certified as required by the State.
  - Lack of operator training.