



# Filter Backwash Recycling Rule: *A Rule Summary for Systems*



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# Filter Backwash Recycling Rule: A Rule Summary for Systems

## BACKGROUND

### *What is the purpose of the rule?*

The Filter Backwash Recycling Rule (FBRR) is intended to reduce the opportunity for recycle practices to adversely affect the performance of drinking water treatment plants and to help prevent microbes, such as *Cryptosporidium*, from passing through treatment systems and into finished drinking water. Customers may become ill if they drink such contaminated water.

Spent filter backwash water, thickener supernatant, and liquids from dewatering processes can contain microbial contaminants, often in very high concentrations. Recycling these streams can reintroduce microbes and other contaminants to the treatment system. Additionally, large volumes of recycle streams may upset treatment processes, allowing contaminants to pass through the system. To minimize these risks, the FBRR requires that recycle streams pass through all the processes of a system's existing conventional or direct filtration system (as defined in 40 CFR 141.2) that the Environmental Protection Agency (EPA) has recognized as capable of achieving 2-log (99 percent) *Cryptosporidium* removal. The FBRR also allows recycle streams to be reintroduced at an alternate location, if the location is State-approved.

### **What is *Cryptosporidium*?**

*Cryptosporidium* is an intestinal parasite that can be passed through a water treatment plant and into the drinking water supply. Infection can cause gastro-intestinal illness, lasting up to two weeks, and may even be life-threatening for people with weakened immune systems. Several outbreaks of cryptosporidiosis have been traced to *Cryptosporidium* in drinking water. The worst outbreak occurred in Milwaukee in 1993 when more than 400,000 people fell ill with flu-like symptoms. *Cryptosporidium* is difficult to treat (inactivate) because it is resistant to most disinfectants used by water treatment systems. Consequently, other treatment processes, such as sedimentation and filtration, must be effective in removing *Cryptosporidium* oocysts from raw water and recycle streams.

### ***Which systems are affected by the FBRR?***

(Rule reference: 40 CFR 141.76(a))

Public water systems that meet **all** of the following criteria are subject to the FBRR:

- \$ The system is a Subpart H system, (i.e. uses surface water or ground water under the direct influence of surface water (GWUDI)).
- \$ The system treats water using conventional or direct filtration. (See the box on page 2 for definitions of conventional and direct filtration.)
- \$ The system recycles one or more of the following: spent filter backwash water, thickener supernatant, or liquids from dewatering processes.

## Conventional Filtration

Conventional filtration treatment, as defined in 40 CFR 141.2, is a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal. Conventional filtration is the most common type of filtration.

## Direct Filtration

Direct filtration, as defined in 40 CFR 141.2, is a series of processes including coagulation and filtration, but excluding sedimentation, and resulting in substantial particulate removal. Typically, direct filtration can be used only with high-quality raw water that has low levels of turbidity and suspended solids.

### *What are the requirements of the FBRR?*

The FBRR has three main components:

1. **Reporting.** The FBRR requires a system to notify the State in writing about its recycle practices if the system is a Subpart H system, practices conventional or direct filtration, and recycles one or more of the regulated recycle streams. More information on reporting is contained in Section 1 beginning on page 3.
2. **Recycle Return Location.** The FBRR requires regulated recycle streams to be returned through all processes of a system's existing conventional or direct filtration system, as defined in 40 CFR 141.2. However, a system may recycle at an alternate location if approved by the State. More information on recycle return location is provided in Section 2 beginning on page 4.
3. **Recordkeeping.** The FBRR includes recordkeeping requirements related to recycling procedures. These requirements are outlined in greater detail in Section 3 beginning on page 6.

## Recycle and Regulated Recycle Flows

**Recycle** – The act of returning recycle streams to a plant's primary treatment process.

**Recycle Flows** – Any water, solid or semi-solid generated by a plant's treatment processes, operational processes, and residual treatment processes that is returned to the plant's primary treatment process. Also referred to as recycle streams.

**Spent Filter Backwash Water** – A stream containing particles that are dislodged from filter media when water is forced back through a filter (backwashed) to clean the filter. Spent filter backwash water contains particles including coagulants, metals, and microbes such as *Cryptosporidium*.

**Thickener Supernatant** – A stream containing the decant from a sedimentation basin, clarifier or other unit that is used to treat water, solids, or semi-solids from the primary treatment processes. The "clear water" that exits the units after particles have been allowed to settle out is thickener supernatant (or sludge thickener supernatant).

**Liquids from Dewatering Processes** – A stream containing liquids generated from a unit used to concentrate solids for disposal. Processes may consist of centrifuges, filter presses, belt presses, vacuum filters, monofills, or other sludge concentrating equipment. Such equipment may be used to dewater sludge from treatment units used in recycling processes or sludge from units found in the primary processes.

# **SECTION 1**

## **REPORTING REQUIREMENTS**

(Rule reference: 40 CFR 141.76(b))

### ***What information must be submitted to the State?***

Each system that uses conventional or direct filtration and recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes must provide the State with the following written information **by December 8, 2003**:

- \$ A plant schematic showing the origin of all flows which are recycled, how the flows are transported, and the location where the flows are reintroduced back into the treatment process;
- \$ Typical recycle flow, highest observed plant flow experienced in the previous year, and design flow for the treatment plant (all flows must be reported in gallons per minute); and
- \$ The State-approved operating capacity for the plant, if the State has made such a determination.

The submitted data will be evaluated by the State to determine whether the system's current recycle return location is acceptable or if the system must make modifications. A system that fails to submit this information to the State commits a monitoring/reporting violation, which requires Tier 3 public notification (see box below). Failure to notify the public within the appropriate time period is a public notification violation. Table 2 lists the information that must be submitted to the State.

### **Violations & Public Notification**

EPA has assigned each violation and situation requiring public notice to one of three categories, or tiers, based on the risk of adverse health effects. After you learn of a violation or situation, public notice must be provided according to the following requirements:

**\$Tier 1** – requires public notice within 24 hours by broadcast media, hand delivery, posting, or another method to reach others.

**\$Tier 2** – requires public notification within 30 days by mail, hand delivery, or another method to reach others.

**\$Tier 3** – requires public notification within one year by mail, hand delivery, or another method to reach others.

## SECTION 2 RECYCLE RETURN LOCATION

(Rule reference: 40 CFR 141.76(c))

### ***Why is the point of return for recycle streams important?***

Recycle streams must be introduced at a point in the treatment plant that incorporates all treatment processes of a conventional or direct filtration system to reduce the opportunity for recycle practices to adversely affect plant performance. An alternate location may also be approved by the State. The point of introduction should ensure effective mixing and thorough dispersion of the recycle stream with raw water prior to subsequent treatment. The continuous and steady introduction of recycle streams tends to have a much less negative impact on the water treatment process than the sporadic introduction of larger volume recycle streams that vary in quality and quantity.

### ***How can a plant that currently does not return its recycle streams through all treatment processes comply with the FBRR?***

A system whose recycle streams currently do not pass through all the direct or conventional treatment plant's unit processes has two options:

- \$ Begin the necessary capital improvements to move the recycle location. Any such capital improvements must be completed by June 8, 2006.
- \$ Request approval of an alternate recycle location. Any requests for alternate recycle locations must be approved by the State no later than June 8, 2004. If capital improvements are required to return recycle streams to a State- approved recycle location, all capital improvements must be completed by June 8, 2006.

### ***What factors will the State consider in deciding whether to approve an alternate location?***

Each State has the flexibility to determine the criteria and factors they will utilize in evaluating and approving alternate recycle locations. Examples of factors that a State may use to evaluate requests for alternate recycle locations include (but are not limited to):

- \$ Does the plant require recycle to an alternate recycle location to maintain optimal finished water quality?
- \$ Does the plant have unique treatment requirements or processes that require the return of recycle streams to an alternate location?
- \$ Is the plant in compliance with the turbidity limits established in the Interim Enhanced Surface Water Treatment Rule/Long Term 1 Enhanced Surface Water Treatment Rule?
- What impacts would the use of the alternate recycle location have on treatment processes and finished water quality?

***What if a proposed or current alternate recycle location has not received State approval?***

If a system returns recycle to a location which does not provide treatment by all conventional or direct filtration processes (as defined in 40 CFR 141.2) without State approval, it commits a treatment technique violation which requires Tier 2 public notification. (See the box on page 3 for a discussion of violation categories.) Failure to notify the public within the appropriate time frame will result in a public notification violation. A system has until June 8, 2004, to receive State approval of its alternate recycle location.

***What if a system does not complete capital improvements within the specified time period?***

If capital improvements are required to comply, a system must complete such improvements no later than June 8, 2006. A system that does not complete capital improvements by the required date commits a treatment technique violation, which requires Tier 2 public notification. Failure to notify the public within the appropriate time frame is a public notification violation.

***Are funds (grants, loans, etc.) available for making capital improvements?***

No special funds have been set aside for improvements to meet the FBRR. However, the Drinking Water State Revolving Loan Fund is available to assist in funding infrastructure upgrades that will ensure safe drinking water. More information about the Drinking Water State Revolving Loan Fund is available at [www.epa.gov/safewater/dwsrf.html](http://www.epa.gov/safewater/dwsrf.html). Systems may also contact the Safe Drinking Water Hotline at 1-800-426-4791, or by e-mail at [hotline-SDWA@epa.gov](mailto:hotline-SDWA@epa.gov). EPA also provides funding to States that have primary enforcement responsibility for their drinking water programs through the Public Water Systems Supervision (PWSS) grants program. Other Federal funds may be available through the U.S. Department of Housing and Urban Development Community Development Block Grant Program and the Rural Utilities Service of the U.S. Department of Agriculture. Individual States may have other loan or grant programs that could provide additional funding for necessary capital improvements. Contact your State for more information regarding such programs.

**TABLE I:  
Recycle Return Location Compliance Schedule**

| <b>If:</b>   | <b>You Must:</b>  | <b>By:</b>   |
|--|---|--|
| Capital improvements are necessary to relocate the point of recycle return . . .   | complete all improvements . . .   | June 8, 2006   |
| You are planning to request State approval for use of an alternate location . . .  | receive approval from the State . . .                                       | June 8, 2004   |
| You are planning to request State approval for use of an alternate location AND capital improvements are necessary . . .   | receive approval from the State for alternate recycle return location . . . | June 8, 2004   |
|  | complete all improvements . . .   | June 8, 2006   |
| You already return flows through the processes of your existing conventional or direct filtration system . . .<br><br>(No capital improvements are necessary and you are not seeking approval for an alternate location) | meet only the reporting and record-keeping requirements of the FBRR.        | See the Reporting and Recordkeeping Checklist on page 8. |

**SECTION 3**  
**RECORDKEEPING REQUIREMENTS**

(Rule reference: 40 CFR 141.76(d))

***What additional data must be collected and maintained?***

In addition to the information submitted to the State, a system must collect and maintain the following data to comply with the FBRR.

- \$ A copy of all information that is submitted to the State (see Section 1).
- \$ A list of recycle streams and the frequency with which they are returned.
- \$ Average and maximum backwash flow rates through the filters and the average and maximum durations of the filter backwash process, in minutes.
- \$ Typical filter run length and a written summary of how filter run length is determined (headloss, turbidity, time, etc.).
- \$ The type of treatment provided for the recycle stream **before** it re-enters the conventional or direct filtration process.
- \$ If applicable, data about the physical dimensions of the equalization or treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used, average dose of chemicals, frequency of chemical addition, and frequency of solids removal.



This information must be collected by June 8, 2004. Systems are not required to submit this information unless requested to do so by the State. However, the information must be retained and made available at the treatment plant for State review during sanitary surveys, Comprehensive Performance Evaluations (CPEs), or other site visit activities. After the State reviews this information, a system may be required to modify its recycling practices. Failure to comply with the reporting requirements is a recordkeeping violation, which requires Tier 3 public notification. Failure to notify the public within the appropriate time frame is a public notification violation. Table 2 provides a list of information the system must collect and retain.

***What are other sources of information on the FBRR and other drinking water treatment issues?***

A number of documents can be found at [www.epa.gov/safewater/filterbackwash.html](http://www.epa.gov/safewater/filterbackwash.html).

- The Filter Backwash Recycling Rule – This document contains the preamble and regulatory language of the Filter Backwash Recycling Rule, as published in the Federal Register.
- The Filter Backwash Recycling Rule Technical Guidance Manual – This document provides greater detail on many of the topics mentioned in this document.

Copies of these documents may be ordered through EPA’s Safe Drinking Water Hotline (1-800-426-4791), the National Service Center for Environmental Publications (1-800-490-9198 ), or the National Technical Information Service at (1-800-553-6847) or [www.ntis.gov](http://www.ntis.gov).

EPA’s Safe Drinking Water Hotline (1-800-426-4791) can also provide general drinking water information. You may e-mail the Safe Drinking Water Hotline at [hotline-SDWA@epa.gov](mailto:hotline-SDWA@epa.gov). The EPA Office of Ground Water and Drinking Water web page is also a good source of general drinking water information ([www.epa.gov/safewater](http://www.epa.gov/safewater)).

**Table 2:  
Reporting and Recordkeeping Checklist**

| <b>Information Qualifying Systems Must Submit to the State by December 8, 2003</b>   |  |
|--|--|
| Plant Schematic  |  |
| Origin of recycle streams  |  |
| Recycle stream transport   |  |
| Point where recycle stream enters treatment train                                    |  |
| Typical recycle flow (in gpm)  |  |
| Highest observed plant flow (in gpm) for previous year                               |  |
| Design flow for treatment plant (gpm)  |  |
| State-approved operating capacity  |  |
| <b>Information Qualifying Systems Must Collect and Retain Onsite by June 8, 2004</b> |  |
| Copy of information submitted to the State   |  |
| List of recycle streams  |  |
| Frequency with which recycle streams are returned                                    |  |
| Average backwash flow rate   |  |
| Maximum backwash flow rate   |  |
| Average duration of filter backwash (in minutes)                                     |  |
| Maximum duration of filter backwash (in minutes)                                     |  |
| Typical filter run length (in minutes)   |  |
| How is run length determined (turbidity, time, head loss, other)                     |  |
| Type of treatment provided for the recycle flow                                      |  |
| Dimensions of equalization unit(s) (if applicable)                                   |  |
| Dimensions of treatment unit(s) (if applicable)                                      |  |
| \$ Typical/average hydraulic loading rates   |  |
| \$ Maximum hydraulic loading rates   |  |
| \$ Type of treatment chemicals used  |  |
| \$ Average dose of chemicals   |  |
| \$ Frequency of chemical use   |  |
| \$ Frequency of solids removal   |  |