

**Kansas Department of Health and Environment
Division of Environment**

**FILTER BACKWASH RECYCLING RULE
REGULATORY IMPACT STATEMENT**

Pursuant to K.S.A.77-416

PROPOSED NEW REGULATIONS

K.A.R. 28-15a-76

May12, 2004

**Executive Summary of
Proposed New Regulations Necessary to Implement the
Filter Backwash Recycling Rule
under the Safe Drinking Water Act**

Legal Authority

The Safe Drinking Water Act (SDWA - P.L.104-182), title XIV of the Public Health Service Act (P.L. 93-523), is the key federal law for protecting public water system customers from harmful contaminants. First enacted in 1974 and substantively amended in 1986 and 1996, the SDWA is administered through regulatory programs that establish standards and treatment requirements for drinking water, control underground injection of wastes that might contaminate water supplies, and protect groundwater. The Environmental Protection Agency (EPA) is the federal agency responsible for administering the provisions of the SDWA.

The 1974 law established the current federal-state arrangement in which states may be delegated primary implementation and enforcement authority for the drinking water program. The Public Water Supply Supervision (PWSS) program and the Drinking Water State Revolving Fund (DWSRF) loan program are the basic federal programs for regulating and financing SDWA requirements to the nations public water systems through state, tribal, and territorial governments. Kansas Statutes Annotated (K.S.A.) 65-171m states in part: "The secretary of health and environment shall adopt rules and regulations for the implementation of this act... The standards established under this section shall be at least as stringent as the national primary drinking water regulations adopted under public law..."

Background

EPA has determined that the presence of microbiological contaminants is a health concern. If finished water supplies contain microbiological contaminants, illnesses and disease outbreaks may result. Of the twelve waterborne cryptosporidiosis outbreaks that have occurred at drinking water systems since 1984, three were linked to contaminated drinking water from water utilities where recycle practices were identified as a possible cause. [The Milwaukee, Wisconsin outbreak alone was responsible for over 400,000 illnesses and 50 deaths.]

Through the prior adoption of the Surface Water Treatment Rule (SWTR) and the Interim Enhanced Surface Water Treatment Rule (IESWTR), EPA set enforceable drinking water treatment technique requirements to reduce the risk of waterborne microbiological disease including *Cryptosporidium* from surface water and groundwater under the direct influence of surface water (GWUDI). The Filter Backwash Recycling Rule (FBRR) provides additional protection from *Cryptosporidium* for systems that practice recycling. The practice of filter backwash recycling had not been previously addressed in drinking water rules promulgated by the EPA.

The FBRR is a regulatory measure designed to ensure that the 2-log *Cryptosporidium* removal requirement established in the IESWTR and in the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) is not jeopardized by recycle practices. The rule requires (with some exceptions) that recycle flows be returned through the processes of a system's existing conventional or direct filtration that is capable of achieving a 2-log (99%) *Cryptosporidium* removal of the recycle flows.

Surges of recycle flows returned to the treatment plant may adversely affect treatment systems by creating hydraulically overloaded conditions (when plants exceed design capacity or state-approved operating capacity) that can lower performance of individual units within a treatment plant resulting in lowered *Cryptosporidium* removal efficiency. Therefore, the rule also requires and ensures that systems and States will have the recycle flow information necessary to evaluate whether site-specific recycle practices may adversely affect the ability of systems to achieve 2-log *Cryptosporidium* removal.

The primary benefits of the FBRR are expected to come from reductions in the risk of illness from microbial pathogens in drinking water - particularly pathogens such as *Cryptosporidium* which are resistant to traditional disinfection practices. Exposure to other pathogenic protozoa, such as *Girardia*, or other waterborne bacterial or viral pathogens is also likely to be reduced by the provisions of the FBRR. In addition to preventing illnesses, the rule is expected to have other non-health related benefits - these benefits are represented as "avoidance costs" associated with waterborne disease outbreaks.

EPA projects that the FBRR will apply to 4,650 systems which serve nearly 35 million people in the United States. EPA estimates that the annualized cost of implementing the FBRR will be \$5.84 million. Further, EPA expects that fewer than 400 systems will require capital improvements to achieve technological infrastructure compliance as a result of the rule. EPA estimates that the capital costs associated with these modifications will be \$5.5 million.

The final FBRR applies to all public water supply systems that 1) use surface water or GWUDI; that 2) utilize direct or conventional filtration processes; and that 3) recycle spent filter backwash water, sludge thickener supernatant, or liquids from dewatering processes.

Federal law now requires that all applicable water systems comply with these drinking water standards regardless of state or tribal law. Concurrent amendments to Kansas Administrative Regulations, however, are necessary to maintain compliance with the provisions of the SDWA regarding state primacy for administrative and enforcement authority and related state eligibility for federal PWSS program grants and DWSRF program loan capitalization grants. The proposed new regulation recommended as K.A.R. 28-15a-76 is no more stringent than federal law requires for these purposes.

As codified under 40 C.F.R. 141, recent federal revisions summarized as the Filter Backwash Recycling Rule which now require concurrent amendments to Kansas Administrative Regulations are summarized in their constituent articles, as follows:

Filter Backwash Recycling Rule

Part 141 - National Primary Drinking Water Regulations

Subpart H - Filtration and Disinfection

§ 141.76 Recycle provisions.

Subpart Q - Public Notification of Drinking Water Violations

- * Appendix A to Subpart Q of Part 141 - NPDWR Violations and Other Situations
Requiring Public Notice

- * Appendix B to Subpart Q of Part 141 - Standard Health Effects Language for Public
Notification

The proposed new regulation recommended as K.A.R. 28-15a-76 will effectively adopt the federal language of these appurtenant National Primary Drinking Water regulations by reference.

Environmental Benefit Statement

1. Need for proposed amendments and environmental benefit likely to accrue.

a. Need

All of the changes are needed to retain approval of KDHE's PWSS program and DWSRF loan program by EPA. The SDWA requires state programs to meet federal primacy requirements for administering and enforcing the SDWA, or they must forfeit their PWSS program grants (approximately \$1.1 million to Kansas in FY2004) and DWSRF program loan capitalization grants (approximately \$9.5 million to Kansas in FY2004).

The federal requirements established in the FBRR apply to all public water systems (PWSs) which use surface water or GWUDI, employ conventional filtration or direct filtration, and recycle spent filter backwash, thickener supernatant, or liquids from dewatering processes. Presently, about 104 PWSs in Kansas are utilizing surface water and/or GWUDI sources and will be subject to the initial reporting / notification requirements of informing KDHE of their recycling practices. About 30 of these systems are currently recycling filter backwash water, thickener supernatant, and/or other liquids from dewatering processes; about 12 additional systems are capable of recycling flows but are not recycling for various reasons. However, only two systems (Chanute and Fredonia) are presently known to require physical modifications to their treatment process facilities in order to achieve compliance with the new recycling requirements.

b. Environmental benefit

Studies considered by EPA have indicated that the presence of microbial contaminants (i.e. *Cryptosporidium*) in drinking water is a health concern. If finished water supplies contain microbial contaminants, disease outbreaks may result. In addition to preventing illnesses, the FBRR is expected to have many non-health related benefits resulting from avoiding non-health related costs associated with waterborne illness outbreaks. Adoption of the proposed regulations is expected to provide an increased level of environmental awareness and health protection to the general public through the improved safety of drinking water supplies.

No other direct benefits to the extended environment are anticipated.

2. When applicable, a summary of the research or data indicating the level of risk to the public health or the environment being removed or controlled by the proposed regulations or amendments.

EPA considered eight different studies conducted between 1991 and 1995 which demonstrated that conventional and direct filtration plants which employed coagulation, flocculation, sedimentation (in conventional filtration only), and filtration steps had the ability to achieve at least 2-log removal of *Cryptosporidium* when meeting specific turbidity limits. These studies formed the basis for the agency's development of turbidity limits associated with the 2-log treatment technique in the IESWTR and the LT1ESWTR. EPA firmly believes these studies demonstrate a minimum of 2-log *Cryptosporidium* removal *only* when water passes through all processes of conventional or direct filtration treatment.

EPA acknowledges that the current research literature does not quantify the decrease in *Cryptosporidium* removal that may be experienced during direct recycle events. Specifically, there is a lack of treatment performance data to accurately model the oocyst removal achieved by individual full-scale treatment processes and the impact recycle may have on treatment unit *Cryptosporidium* removal and resulting finished water quality.

In summary, the goal of the FBRR is to reduce the potential for oocysts getting into the finished water; other disinfection-resistant pathogens may also be removed more efficiently due to implementation of these provisions. (EPA considers it appropriate and prudent to err on the side of public health protection when there are indications that exposure to a contaminant may present risks to public health, rather than take no action until risks are unequivocally proven.)

3. If specific contaminants are to be controlled by the proposed regulation or amendment, a description indicating the level at which the contaminants are considered harmful according to current available research.

Pursuant to studies conducted and evaluated in consideration of the IESWTR and the LT1ESWTR, EPA regards any level of *Cryptosporidium* in drinking water to be potentially harmful, and has set a maximum contaminant level goal (MCLG) of "zero" for this pathogen; this is consistent with the agency's existing MCLGs for similar pathogens such as *Legionella* and *Giardia lamblia*. PWSs that use filtered surface water or GWUDI are now required to achieve a 99% (2 log) physical removal of *Cryptosporidium* under the new IESWTR and LT1ESWTR rules.

Economic Impact Statement

1. Are the proposed regulations or amendments mandated by federal law as a requirement for participating in or implementing a federally subsidized or assisted program?

Yes. Federal law now requires that all PWSs that 1) use surface water or GWUDI; that 2) utilize direct or conventional filtration processes; and that 3) recycle spent filter backwash water, sludge thickener supernatant, or liquids from dewatering processes must comply with these drinking water standards regardless of state adoption. The proposed new regulation recommended as K.A.R. 28-15a-76 is necessary to maintain compliance with the provisions of the SDWA regarding state primacy for administrative and enforcement authority and related state eligibility for federal PWSS program grants and DWSRF program loan capitalization grants.

2. Do the proposed regulations or amendments exceed requirements of applicable federal law?

No. The concurrent amendments and proposals recommended are no more stringent than federal law requires for these purposes. Under some requirements, KDHE proposes to implement special provisions permitted by EPA to allow more flexibility and reduced monitoring activities to the public water suppliers effected by these rules.

3. Description of costs to agencies, to the general public, and to persons who are effected by, or subject to, the regulations.

The core components of KDHE's PWSS program have already been developed and maintained for many years. However, KDHE must continually upgrade its regulations to conform with EPA's regulations to maintain primacy under SDWA. The regulations will only be minimally revised as it regards the required amendments for the FBRR. There will be costs to the agency and to the general public associated with the amendments which will be significantly offset by EPA grants to KDHE for the PWSS program and the DWSRF loan program.

a. Capital and annual costs of compliance with the proposed regulations or amendments and the persons who will bear those costs.

The primary costs associated with these proposed regulations will be borne by the PWSs (both publically and privately owned) who are required to provide physical alterations to their treatment plant processes to re-direct recycle flows to an approved location and to achieve the standards. As with KDHE, the core components of compliance with the SDWA for the majority of these subject public water systems have already been developed and maintained for many years. These activities will, however, require additional time, labor, and/or financial resources by these entities to generate, maintain, retain, disclose, and/or provide information to the regulating party as well as developing and maintaining additional

technological infrastructure.

EPA estimates that, assuming a 7% cost of capital in 2000 dollars amortized over a 20 year period, the total annualized cost in the United States for implementing the FBRR is \$7.2 million for the approximate 4,650 systems which will be affected. This includes:

- start-up costs to utilities of \$7.1 million.
- start-up and annualized monitoring costs to states of \$0.1 million.

(EPA estimates that only about 371 of these systems will require major physical alterations to re-direct recycle flows at costs totaling about \$45.2 million. However, none of these systems are expected to be in Kansas.)

In Kansas, presently about 104 PWSs in Kansas are utilizing surface water and/or GWUDI sources and will be subject to the initial reporting / notification requirements of informing KDHE of their recycling practices. About 30 of these systems are currently recycling filter backwash water, thickener supernatant, and/or other liquids from dewatering processes; 12 additional systems are capable of recycling flows but are not recycling for various reasons. Only Fredonia and Chanute are known to require minor physical modifications to their treatment process facilities in order to achieve compliance with the new recycling requirements. Therefore, the relative share of these costs to Kansas are expected to be:

Estimate Number of Subpart H Systems in Kansas	104
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	Cost per system	No. of systems	Cost for item
Estimated Cost for systems to write a confirmation letter confirming they do not have the capability to recycle any of the regulated streams.	\$30	66	\$1,980
Estimated cost for systems to remove the capability to recycle any of the regulated side stream.	\$200	8	\$1,600
Estimated cost for systems to prepare and submit notification and record keeping forms.	\$200	30	\$6,000
Estimated cost for Chanute to move location of regulated side stream flows.	\$1,000		\$1,000
Estimated cost for Fredonia to move location of regulated side stream flows.	\$2,000		\$2,000
Estimated number of systems which need to have the possibility of surge evaluated in more detail.	\$1,000	4	\$4,000

Current estimated cost impact to Kansas Public Water Systems.			\$16,580
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In Kansas, for FBRR start-up costs, it is expected that these regulations will result in an average increase to a typical PWS of about \$200 to file the initial notification / reporting requirement of their recycling practices with KDHE. Only Fredonia and Chanute are known to require minor physical modifications to their treatment process facilities in order to achieve compliance with the new recycling requirements.

These costs will be incurred by the public water suppliers and their customers even if Kansas does not adopt the proposed regulations because EPA will still be enforcing the FBRR. If Kansas does adopt the proposed regulations, KDHE will be provided with more federal grant funds (PWSS and DWSRF) which can be distributed to water systems requiring treatment upgrades and/or other compliance related cost reimbursements. Although it is extremely unlikely in any cases that substantial renovation will be necessitated, some systems may wish to consider other cost / compliance alternatives to investing in new or upgraded facilities such as purchasing water from other sources or consolidating with other systems.

b. Initial and annual costs of implementing and enforcing the proposed regulations or amendments, including the estimated amount of paperwork, and the state agencies, other governmental agencies or other persons who will bear the costs.

Costs to KDHE associated with these proposed regulations are estimated to be approximately \$2,000 (approximately \$100 per year for the first 20 years). This includes the increased demand for staff time and office resources to implement, assist, monitor, and enforce the new requirements for public water suppliers, as well as complying with EPA's reporting / record keeping requirements for KDHE. These costs are reimbursed by EPA through the PWSS program.

No other state agencies, governmental agencies, persons, or entities are anticipated to incur or bear any of the costs associated with these proposed regulations.

c. Costs which would likely accrue if the proposed regulations or amendments are not adopted, the persons who will bear the costs and those who will be effected by the failure to adopt the regulations.

The SDWA requires state programs to meet federal primacy requirements for administration and enforcement authority in order to qualify for the PWSS program grants and DWSRF program loan capitalization grants. Failure to amend these regulations would result in KDHE losing approximately \$1.1 million to Kansas program grants in FY2004 and DWSRF program loan capitalization grants of approximately \$9.5 million to Kansas in FY2004. This would in turn negatively impact the public water suppliers and their customers who would not be eligible for state financial assistance but must still comply with EPA requirements.

EPA believes that, if performed improperly, returning *Cryptosporidium* to the treatment process in recycle flows can create additional public health risk. Further, EPA believes the FBRR will help prevent *Cryptosporidium* oocysts and other contaminants from entering finished drinking water supplies and causing endemic illness or costly waterborne disease outbreaks. Additionally, the FBRR will aid states and systems by ensuring that they have the requisite information to evaluate whether a treatment plant may be susceptible to hydraulic disruptions as a result of recycling, and whether the existing recycle practices sufficiently address potential health risks.

EPA states that the monetary costs associated with a water-borne microbial outbreak can be difficult to quantify and will vary with respect to a host of criteria. Accordingly, analytical limitations in the estimation of monetized benefits for the FBRR prevented EPA from quantitatively describing the incremental benefit of the various regulatory alternatives considered for the FBRR rule making. Therefore, EPA determined the benefits of the FBRR justify their costs on a qualitative basis rather than on a quantitative basis.

d. A detailed statement of the data and methodology used in estimating the costs used in the statement.

The data and methodology used in preparing this regulatory impact statement were primarily obtained from EPA references, documents, and publications on the FBRR as published in the *Federal Register* on June 8, 2001. Where supportable, some general inferences were made to relate national level data to the State of Kansas and KDHE. Representative cost figures for Kansas systems were also obtained from the KDHE DWSRF loan program data.

e. Description of any less costly or less intrusive methods that were considered by the agency and why such methods were rejected in favor of the proposed regulation.

There are no less intrusive or less costly methods that were available for consideration by KDHE to achieve the purposes of the proposed amendments.

f. Consultation with the League of Kansas Municipalities, Kansas Association of Counties, and Kansas Association of School Boards.

KDHE anticipates that the proposed amendments will have a direct and substantial fiscal impact on the constituency of the League of Kansas Municipalities. No direct impact is anticipated on the constituents of the Kansas Association of Counties or of the Kansas Association of School Boards. A copy of this regulatory impact statement was sent to each of these organizations on May 12, 2004.