

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

**INTERIM ENHANCED SURFACE WATER TREATMENT RULE
REGULATORY IMPACT STATEMENT**

Pursuant to K.S.A. 77-416

PROPOSED NEW REGULATIONS

K.A.R. 28-15a-2;
K.A.R. 28-15a-70;
K.A.R. 28-15a-73;
K.A.R. 28-15a-153;
K.A.R. 28-15a-170;
K.A.R. 28-15a-172 through K.A.R. 28-15a-175.

May 12, 2004

**Executive Summary of
Proposed New Regulations
Necessary to Implement the
Interim Enhanced Surface Water Treatment 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 nation's 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

In response to national concerns about the safety of our drinking water and its impact on public health, Congress first adopted the SDWA in 1974. Twelve years later, disease-causing microbial contamination had still not been sufficiently controlled, and Congress significantly amended the act when it was re-authorized in 1986. Although the SDWA had been slightly amended on three previous occasions, the 1986 amendments were more comprehensive and required the EPA to establish regulations within certain time-frames, to require disinfection of nearly all public water supplies, to specify filtration requirements for nearly all water systems that draw their water from surface sources or groundwater under the direct influence of surface water (GWUDI), and to develop additional programs to protect ground water supplies. The 1986 amendment also required EPA to set maximum contaminant levels (MCLs) and maximum contaminant level goals (MCLGs) for 83 named contaminants (including microbial pathogens such as *Giardia lamblia* and *Legionella*). EPA responded to Congress' mandate by establishing the Surface Water Treatment Rule and the Total Coliform Rule.

Accordingly, more than 240 million people in the United States now consume water that has been disinfected. Over the last 15 years, however, it has been determined that some microbial pathogens such as *Cryptosporidium* are highly resistant to traditional disinfection practices. Further, it has also since become known that drinking water disinfectants themselves can react with naturally occurring substances in source water and distribution systems to form unintended organic and inorganic byproducts which may pose health risks.

In 1996, Congress again amended the SDWA by requiring EPA to develop rules which balance the risks between microbial pathogens and disinfection byproducts in drinking water. EPA responded to this directive in 1998 by promulgating two companion rules, the Interim Enhanced Surface Water Treatment Rule (IESWTR - regulates microbial contaminants) and the Stage 1 Disinfection and Disinfection Byproducts Rule (Stage 1 DBPR - regulates disinfectants). Both of these rules build on the existing foundations in the SDWA and the previous rules on disinfectants and microbe treatment. They are intended by EPA to form a parallel foundation for implementing sets of progressively more protective regulations in the future. The IESWTR is specifically intended to prevent significant increases in microbial risk that might otherwise occur when systems implement the Stage 1 DBPR and begin reducing the level of disinfectants being utilized in their treatment programs. It is also designed to concurrently optimize treatment reliability and to enhance physical removal efficiencies in order to minimize the *Cryptosporidium* levels in finished water.

The IESWTR applies to all public water systems (PWSs) that use surface water or GWUDI as a source and serve 10,000 or more people. Additionally, it establishes a schedule by which primacy states are required to conduct sanitary surveys for all public water systems using surface water or GWUDI, regardless of the population served. The major IESWTR requirements essentially became effective on January 1, 2002.

The key provisions of the IESWTR include a MCLG of “zero” for *Cryptosporidium* and a *Cryptosporidium* filtering requirement of 99% (2 log) removal for systems that filter water. It also requires strengthened turbidity performance standards and combined / individual filter effluent monitoring provisions. It further requires that all subject systems complete a disinfection profiling and benchmarking program, and prohibits the construction of new uncovered finished water storage facilities. For system which do not filter (none applicable in Kansas), water systems must include *Cryptosporidium* in their watershed control programs.

Federal law now requires that applicable PWSs 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 new proposed regulations recommended as K.A.R. 28-15a-2, K.A.R. 28-15a-70, K.A.R. 28-15a-73, K.A.R. 28-15-153, K.A.R. 28-15a-170, and K.A.R.

28-15a-172 through K.A.R. 28-15a-175 are no more stringent than federal law requires for these purposes. KDHE is not required to adopt, and is not proposing to adopt, the MCLG which has been established by EPA.

As codified under 40 C.F.R. 141, recent federal revisions to the National Primary Drinking Water Regulations summarized as the Interim Enhanced Surface Water Treatment Rule which now require concurrent amendments to Kansas Administrative Regulations are summarized in their constituent articles, as follows:

Interim Enhanced Surface Water Treatment Rule

Part 141 - National Primary Drinking Water Regulations

Subpart A - General

§ 141.2 Definitions.

Subpart D - Reporting and Recordkeeping

§ 141.32 Public notification.

Subpart G - National Revised Primary Drinking Water Regulations: Maximum Contaminant Levels and Maximum Residual Disinfectant Levels

§ 141.52 Maximum contaminant level goals for microbiological contaminants.

Subpart H - Filtration and Disinfection

§ 141.70 General requirements.

§ 141.71 Criteria for avoiding filtration.

§ 141.73 Filtration.

Subpart O - Consumer Confidence Reports

§ 141.153 Content of the reports.

Subpart P - Enhanced Filtration and Disinfection

§ 141.170 General requirements.

§ 141.171 Criteria for avoiding filtration.

- § 141.172 Disinfection profiling and benchmarking.
- § 141.173 Filtration.
- § 141.174 Filtration sampling requirements.
- § 141.175 Reporting and recordkeeping requirements.

The new proposed regulations recommended as K.A.R. 28-15a-2, K.A.R. 28-15a-70, K.A.R. 28-15a-73, K.A.R. 28-15-153, K.A.R. 28-15a-170, and K.A.R. 28-15a-172 through K.A.R. 28-15a-175 will effectively adopt the federal language of these appurtenant National Primary Drinking Water Regulations by reference.

(K.A.R. 28-15a-32, K.A.R. 28-15a-52, K.A.R. 28-15a-71, and K.A.R. 28-15a-171 are proposed to be reserved.)

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 the 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 loan program capitalization grants (approximately \$9.5 million to Kansas in FY2004).

The federal requirements established in the IESWTR apply to all PWSs that use surface water or GWUDI and serve 10,000 or more people - about 16 in Kansas. The rule also modifies the requirement for primacy states to conduct sanitary surveys for all PWSs that use surface water or groundwater under the influence of surface water, regardless of the population served.

b. Environmental benefit

In 1990, EPA's Science Advisory Board (an independent panel of experts appointed by Congress) cited drinking water contamination as one of the most important environmental risks and indicated that disease-causing microbial contaminants are probably the greatest remaining health risk management challenge for drinking water suppliers. Adoption of the proposed regulations is expected to provide improved drinking water quality and an increased level of health protection to the general public. According to EPA, the IESWTR decreases the likelihood of endemic illness from *Cryptosporidium* by 110,000 to 463,000 cases annually.

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.

The U.S. Center for Disease Control indicates that over 400 waterborne disease outbreaks were reported between 1980 and 1996, with over 750,000 associated cases of disease; the principal disease-causing agents include protozoa, viruses, and bacteria, as well as several chemicals. Most of these cases were associated with surface water. It is generally considered that, for a variety of reasons, the occurrence of these cases is substantially understated.

In considering the maximum contaminant level goal (MCLG) of "zero" for *Cryptosporidium*, EPA

relied upon animal studies, human epidemiology studies of waterborne outbreaks of cryptosporidiosis, and most notably a human feeding study which indicates that human ingestion of even a single *Cryptosporidium* oocyst can result in a 0.5% probability of infection. EPA considered eight new studies on the removal of *Cryptosporidium* by filtration in addition to existing data and information from the Microbial-Disinfection Byproduct Advisory Committee which determined that only a 2-log removal of *Cryptosporidium* could be justified by the higher treatment costs.

In considering the amendments to turbidity control related to filtration performance and filter monitoring and reporting, EPA relied on three recent data sets to evaluate the national impact of modifying existing turbidity requirements, four new studies to evaluate the potential for improving individual filter performance, and four new studies to assess the performance evaluation of turbidity measurement. EPA concluded that revising turbidity criteria was necessarily the only practical method which will insure that systems consistently achieve a higher level of compliance with the current existing standard as well as attempting a higher level of compliance with the new standard, that systems need to have a greater understanding of individual filter performance by more frequent monitoring to achieve more uniform treatment results, and that avoidable variability currently results from using different turbidimeter models and methods, and different laboratory procedures, which can be modified and improved by the new standards.

In considering the strategy for disinfection profiling and benchmarking, EPA considered data on microbial inactivation provided by PWSs to the Microbial-Disinfection Byproduct Advisory Committee; the data demonstrated high variability of microbial inactivation on a day-to-day basis as well as on a yearly basis depending on changes in water temperature, flow rate, contact time, seasonal changes in residual disinfectant, pH, and disinfectant demand and disinfectant residual. EPA concluded these requirements were the most comprehensive and efficient way for a PWS to document the variations, to characterize disinfection practices, and if necessary, to change its disinfection practices to reduce disinfectant residuals and eliminate disinfection byproducts.

In considering the revisions pertaining to the definition of “groundwater under the direct influence of surface water”, the inclusion of *Cryptosporidium* in watershed control requirements, and covered finished water reservoirs, EPA relied extensively on a mixture of studies and policy recommendations from the American Water Works Association, the Association of State Drinking Water Administrators, and surveys of current public water system practices and state regulations. EPA concluded that the level of microbes present in groundwater closely associated with surface water warrants its inclusion in the requirements for the IESWTR, but only for systems serving 10,000 or more people. Similarly, EPA concluded that the level of *Cryptosporidium* present in the uncontrolled watersheds of systems which do not use filtration treatment warrants the inclusion of *Cryptosporidium* in watershed management requirements. Further, EPA conclusively determined that requiring all new finished water reservoirs to be covered was justified by its cost in relation to the level of pathogen protection afforded, but that the requirement was not justified in being made retroactive to all existing systems at the current costs of reconstruction.

In regard to the requirement that all primacy states conduct regular sanitary surveys on all PWSs utilizing surface water or groundwater under the direct influence of surface water (regardless of population served), EPA utilized a report from the General Accounting Office which found that sanitary surveys are often deficient in how they are conducted, documented, and/or interpreted. The report also indicated that, regardless of size, the deficiencies previously disclosed went uncorrected. EPA subsequently utilized a report by the Association of State Drinking Water Administrators in establishing the integral components of a comprehensive sanitary survey requirement under the new rule.

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 this rule, EPA regards any level of *Cryptosporidium* in drinking water to be potentially harmful, and accordingly 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 serving 10,000 or more people that use filtered surface water or groundwater under the influence of surface water are now required to achieve a 99% (2 log) physical removal of *Cryptosporidium* under the new rule.

In concept, EPA similarly regards a maximum turbidity level of “zero” as the optimum standard at which public health risks from high densities of pathogens in poor quality source waters are totally minimized. However, by definition, EPA similarly regards a conventional and direct filtration combined filter effluent of 0.3 nephelometric turbidity units (or less) in at least 95% of the measurements taken each month, and a maximum level of 1 nephelometric turbidity units at any time, to be the most practical and justifiable minimum standard which can be achieved in consideration of current treatment technology and costs.

KDHE is not required to adopt, and is not proposing to adopt, the MCLG established for *Cryptosporidium* in the IESWTR.

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 using surface water and GWUDI which serve 10,000 or more people comply with these drinking water standards regardless of state or tribal law. The concurrent amendments proposed to these Kansas Administrative Regulations are necessary to maintain compliance with the provisions of SWDA 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 the requirements of applicable federal law?

No. The proposed new regulations recommended as K.A.R. 28-15a-2, K.A.R. 28-15a-70, K.A.R. 28-15a-73, K.A.R. 28-15-153, K.A.R. 28-15a-170, and K.A.R. 28-15a-172 through K.A.R. 28-15a-175 are no more stringent than federal law requires for these purposes. KDHE is not required to adopt, and is not proposing to adopt, the MCLG established by EPA under the IESWTR.

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 regulatory compliance with EPA to maintain primacy under the SDWA. The regulations will only be minimally revised as it regards the required amendments for the IESWTR. 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.

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. The primary costs associated with these proposed regulations will be borne by the PWSs (both publically and privately owned) who are required to conduct the necessary sampling, analysis, and monitoring, and in those cases where standards are exceeded, to provide improved turbidity treatment for the removal of contaminants to achieve standards. 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 technological infrastructure.

EPA estimates that these regulations will result in total national, annual compliance costs of \$307 million in 1998 dollars at a 7% rate of cost of capital over a 20 year amortization period for 1381 treatment plants. This estimate includes:

- \$192 million as total treatment upgrade costs to utilities.
- \$99 million as total start-up and monitoring costs to utilities per year.
- \$16 million as total start-up and monitoring costs to the states per year.

Because of increased costs to the public water systems, EPA expects that:

- 92% of households will incur less than \$1 of extra monthly cost;
- 7% of households will incur an additional monthly cost between \$1 and \$5;
- and 1% of household will incur an additional monthly cost of \$8.

There are many different treatment options available for surface water systems which will be required to comply with this new rule. Treatment options vary from constructing a new treatment plant or upgrading an existing treatment plant, to simply making a change in chemicals used to treat the water. For many water systems, treatment options are also influenced by other rules such as the Stage 1 DBPR. The actual costs of compliance won't be known until communities have a chance to evaluate their options. The costs associated with treatment process upgrades are expected to be extremely variable depending on the current system size and age, and on the present system configuration.

“Average” or “typical” system costs for new rule compliance can be masked by several factors. With ever-changing and more complex drinking water regulations, some water systems benefit by making costly improvements to address more than one new rule or regulation at once. In some cases, water systems are also replacing infrastructure which is already very old, outdated, and badly in need of repair. Other systems may find that it is entirely more cost-effective to discontinue primary treatment operations and opt to purchase and pipe water from other nearby systems.

For example, in order to comply with all of the new rules, the City of Burlington opted to construct a totally new water treatment plant at a cost of \$5.8 million. The City of Baxter Springs recently upgraded their existing water treatment plant to comply with all of the new rules and regulations at a cost of \$2.6 million. The City of Coffeyville completed treatment plant upgrades to comply with the IESWTR and stage 1 DBPR at a cost of \$1.7 million. Woodson Rural Water District No. 1 recently decided to just purchase water from Yates Center and completed a new 10 mile water transmission line at a cost of \$942,431.

The IESWTR requires turbidimeters be installed as monitoring devices on all system filters. Standard costs for the turbidimeter equipment and installation are approximately \$7,500 per filter.

It is expected that the cost of implementing and enforcing the proposed regulations will ultimately be passed through to the PWS customers. These costs will be incurred by the PWSs and their customers even if Kansas does not adopt the proposed regulations because EPA will still be enforcing the IESWTR. If Kansas does adopt the proposed regulations, KDHE will be provided with federal grant funds (PWSS and DWSRF) which can be distributed to water systems requiring treatment upgrades and some other compliance related cost reimbursements.

EPA expects that these costs will be offset by the national benefits of reducing illness from the requirements in IESWTR in an estimated amount ranging from \$263 million to \$1.24 billion per year. This estimate is calculated on a valuation of \$2,000 per incidence of cryptosporidiosis prevented. EPA estimates the IESWTR will also reduce the risk of more severe health impacts on sensitive populations, including the risk of mortality. Additionally, the IESWTR will reduce the likelihood of outbreaks of cryptosporidiosis and its associated costs by providing a larger margin of safety against such outbreaks in some systems. EPA expects the IESWTR will also result in reduced risks from other pathogens and enhance the aesthetic quality of waters available to the public.

b. Initial and annual cost 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 or entities who will bear the costs.

KDHE added four additional positions to implement the IESWTR, and two additional rules, the Long Term 1 Enhanced Surface Water Treatment Rule and the Stage 1 Disinfectants / Disinfection Byproducts Rule. These positions are an environmental engineer, two environmental scientists, and a clerical position. Salary, benefits, and other costs are an estimated \$203,000 annually. These costs are funded with a grant from the EPA.

The requirement that KDHE conduct a sanitary survey of every public water supply using surface water or GWUDI at least every 3 or 5 years will result in significant costs to the agency. A sanitary survey is defined as an onsite review of the water source, facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources, and operations and the distribution of safe drinking water.

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 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 the EPA requirements under IESWTR.

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 statements on the Interim Enhanced Surface Water Treatment Rule as published in the *Federal Register* on December 16, 1998. 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 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