



## Fact Sheet - Long Term 2 Enhanced Surface Water Treatment Rule

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In the past 30 years, the Safe Drinking Water Act (SDWA) has been highly effective in protecting public health and has also evolved to respond to new and emerging threats to safe drinking water. Disinfection of drinking water is one of the major public health advances in the 20th century. One hundred years ago, typhoid and cholera epidemics were common through American cities; disinfection was a major factor in reducing these epidemics.

In the past 15 years, we have learned that there are specific microbial pathogens, such as *Cryptosporidium*, which can cause illness, and are highly resistant to traditional disinfection practices. We also know that the disinfectants themselves can react with naturally-occurring materials in the water to form byproducts, which may pose health risks.

Amendments to the SDWA in 1996 require EPA to develop rules to balance the risks between microbial pathogens and disinfection byproducts (DBPs). The Stage 1 Disinfectants and Disinfection Byproducts Rule and Interim Enhanced Surface Water Treatment Rule, promulgated in December 1998, were the first phase in a rulemaking strategy required by Congress as part of the 1996 Amendments to the Safe Drinking Water Act.

The Long Term 2 Enhanced Surface Water Treatment Rule builds upon earlier rules to address higher risk public water systems for protection measures beyond those required for existing regulations.

The Long Term 2 Enhanced Surface Water Treatment Rule and the Stage 2 Disinfection Byproduct Rule are the second phase of rules required by Congress. These rules strengthen protection against microbial contaminants, especially *Cryptosporidium*, and at the same time, reduce potential health risks of DBPs.

### Questions and Answers

#### ***What is the LT2ESWTR?***

The purpose of Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) is to reduce illness linked with the contaminant *Cryptosporidium* and other pathogenic microorganisms in drinking water. The LT2ESWTR will supplement existing regulations by targeting additional *Cryptosporidium* treatment requirements to higher risk systems. This rule also contains provisions to reduce risks from uncovered finished water reservoirs and provisions to ensure that systems maintain microbial protection when they take steps to decrease the formation of disinfection byproducts that result from chemical water treatment.

Current regulations require filtered water systems to reduce source water *Cryptosporidium* levels by 2-log (99 percent). Recent data on *Cryptosporidium* infectivity and occurrence indicate that this treatment requirement is sufficient for most systems, but additional treatment is necessary for certain

higher risk systems. These higher risk systems include filtered water systems with high levels of *Cryptosporidium* in their water sources and all unfiltered water systems, which do not treat for *Cryptosporidium*.

The LT2ESWTR is being promulgated simultaneously with the Stage 2 Disinfection Byproduct Rule to address concerns about risk tradeoffs between pathogens and DBPs.

### ***What are the health risks of Cryptosporidium?***

*Cryptosporidium* is a significant concern in drinking water because it contaminates most surface waters used as drinking water sources, it is resistant to chlorine and other disinfectants, and it has caused waterborne disease outbreaks. Consuming water with *Cryptosporidium* can cause gastrointestinal illness, which may be severe and sometimes fatal for people with weakened immune systems (which may include infants, the elderly, and people who have AIDS).

### ***Who must comply with this rule?***

This regulation will apply to all public water systems that use surface water or ground water under the direct influence of surface water.

### ***What does the rule require?***

**Monitoring:** Under the LT2ESWTR, systems will monitor their water sources to determine treatment requirements. This monitoring includes an initial two years of monthly sampling for *Cryptosporidium*. To reduce monitoring costs, small filtered water systems will first monitor for *E. coli*—a bacterium which is less expensive to analyze than *Cryptosporidium*—and will monitor for *Cryptosporidium* only if their *E. coli* results exceed specified concentration levels.

Monitoring starting dates are staggered by system size, with smaller systems beginning monitoring after larger systems. Systems must conduct a second round of monitoring six years after completing the initial round to determine if source water conditions have changed significantly. Systems may use (grandfather) previously collected data in lieu of conducting new monitoring, and systems are not required to monitor if they provide the maximum level of treatment required under the rule.

**Cryptosporidium treatment:** Filtered water systems will be classified in one of four treatment categories (bins) based on their monitoring results. The majority of systems will be classified in the lowest treatment bin, which carries no additional treatment requirements. Systems classified in higher treatment bins must provide 90 to 99.7 percent (1.0 to 2.5-log) additional treatment for *Cryptosporidium*. Systems will select from a wide range of treatment and management strategies in the “microbial toolbox” to meet their additional treatment requirements. All unfiltered water systems must provide at least 99 or 99.9 percent (2 or 3-log) inactivation of *Cryptosporidium*, depending on the results of their monitoring. These *Cryptosporidium* treatment requirements reflect consensus recommendations of the Stage 2 Microbial and Disinfection Byproducts Federal Advisory Committee.

**Other requirements:** Systems that store treated water in open reservoirs must either cover the reservoir or treat the reservoir discharge to inactivate 4-log virus, 3-log *Giardia lamblia*, and 2-log *Cryptosporidium*. These requirements are necessary to protect against the contamination of water that occurs in open reservoirs. In addition, systems must review their current level of microbial treatment before making a significant change in their disinfection practice. This review will assist systems in maintaining protection against microbial pathogens as they take steps to reduce the formation of disinfection byproducts under the Stage 2 Disinfection Byproducts Rule, which EPA is finalizing along with the LT2ESWTR.

***What are the benefits of the rule?***

The LT2ESWTR will improve the control of *Cryptosporidium* and other microbiological pathogens in drinking water systems with the highest risk levels. EPA estimates that full compliance with the LT2ESWTR will reduce the incidence of cryptosporidiosis - the gastrointestinal illness caused by ingestion of *Cryptosporidium* - by 89,000 to 1,459,000 cases per year, with an associated reduction of 20 to 314 premature deaths. The monetized benefits associated with these reductions ranges from \$253 million to \$1.445 billion per year. The additional *Cryptosporidium* treatment requirements of the LT2ESWTR will also reduce exposure to other microbial pathogens, such as *Giardia*, that co-occur with *Cryptosporidium*. Additional protection from microbial pathogens will come from provisions in this rule for reviewing disinfection practices and for covering or treating uncovered finished water reservoirs, though EPA has not quantified these benefits.

***What are the costs of the rule?***

The LT2ESWTR will result in increased costs to public water systems and states. The average annualized present value costs of the LT2ESWTR are estimated to range from \$92 to \$133 million (using a three percent discount rate). Public water systems will bear approximately 99 percent of this total cost, with states incurring the remaining 1 percent. The average annual household cost is estimated to be \$1.67 to \$2.59 per year, with 96 to 98 percent of households experiencing annual costs of less than \$12 per year.

***What technical information will be available on the rule?***

The following guidance documents will be available:

- Source Water Monitoring Guidance
- Microbial Laboratory Guidance
- Small Entity Compliance Guidance
- Microbial Toolbox Guidance Manual
- Ultraviolet Disinfection Guidance Manual
- Membrane Filtration Guidance Manual
- Simultaneous Compliance Guidance Manual
- Low-pressure Membrane Filtration for Pathogen Removal: Application, Implementation, and Regulatory Issues

***Where can I find more information about this notice and the LT2ESWTR?***

For general information on the LT2ESWTR, contact the Safe Drinking Water Hotline at (800) 426-4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding legal holidays, from 10:00 a.m. to 4:00 p.m., Eastern time. For copies of the Federal Register notice of the regulation or technical fact sheets, visit the EPA Safewater website at <http://www.epa.gov/safewater/disinfection/lt2>. For technical inquiries, email [stage2mdbp@epa.gov](mailto:stage2mdbp@epa.gov).