

### C. What Are the Health Concerns Associated With *Cryptosporidium*?

When someone is infected with *Cryptosporidium*, they may contract cryptosporidiosis, a disease which can cause diarrhea, stomach cramps, nausea, loss of appetite, and a mild fever. *Cryptosporidium* has become recognized as one of the most common causes of waterborne disease (drinking and recreational) in humans in the United States. The parasite is found in every region of the United States and throughout the world ([www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/factsht\\_cryptosporidiosis.htm](http://www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/factsht_cryptosporidiosis.htm)). The symptoms of cryptosporidiosis begin an average of seven days after infection. Persons with a normal, healthy immune system can expect their illness to last for two weeks or less, with constant or intermittent diarrhea. However, even after symptoms cease, an individual can still pass *Cryptosporidium* in the stool for up to two months, and may be a source of infection for others.

Cryptosporidiosis is not treatable with antibiotics, so prevention of infection is critical. People with weakened immune systems (those with HIV/AIDS, on cancer chemotherapy, or who have received organ transplants) will have cryptosporidiosis for a longer period of time, and it could become life-threatening. Young children, pregnant women, or the elderly infected with cryptosporidiosis can quickly become severely dehydrated.

Twelve waterborne cryptosporidiosis outbreaks have occurred at drinking water systems since 1984 (Craun, 1998; USEPA, 2000a). The largest of the known outbreaks occurred in Milwaukee and was responsible for over 400,000 illnesses and at least 50 deaths (Hoxie, *et al.*, 1997; MacKenzie *et al.*, 1994); other known outbreaks have occurred in smaller communities and have involved many fewer people. An incident such as a rainstorm that flushes many oocysts into the source water or causes a sanitary sewer overflow combined with a water treatment plant upset could allow a large pulse of oocysts to move past the multiple barriers of a water treatment plant.

### D. Does This Regulation Apply to My Water System?

Today's final regulation applies to all small (serving less than 10,000 people) public water systems (PWSs) that use surface water or ground water under the direct influence of surface water (GWUDI).

### E. How Is the EPA Regulating *Cryptosporidium* in the LT1ESWTR?

In the IESWTR (63 FR 69478), EPA established a maximum contaminant level goal (MCLG) of zero for *Cryptosporidium*. When establishing an MCLG, EPA must also establish either a corresponding Maximum Contaminant Level (MCL) or a treatment technique. In the IESWTR and in today's LT1ESWTR, the Agency chose to establish a treatment technique that relies on strengthening water treatment processes already in place. For filtered systems this means achieving at least 2-log (99 percent) removal of *Cryptosporidium* by meeting strengthened combined filter effluent turbidity limits as established by today's rule. For unfiltered systems it means maintaining and improving *Cryptosporidium* control under existing watershed control plans.

### F. What Other Requirements Are Included in This Rule?

Today's final regulation includes several requirements.

- All surface water and GWUDI systems serving fewer than 10,000 people must meet the requirements for achieving a 2-log removal or control of *Cryptosporidium*;
- Conventional and direct filtration systems must comply with specific combined filter effluent turbidity requirements while alternative filtration systems (systems using filtration other than conventional filtration, direct filtration, slow sand filtration, or diatomaceous earth filtration), must demonstrate the ability to achieve 2-log removal of *Cryptosporidium* and comply with specific State-established combined filter effluent turbidity requirements;
- Conventional and direct filtration systems must continuously monitor the turbidity of individual filters and perform follow-up activities if this monitoring indicates a potential problem;
- Systems must develop a disinfection profile unless they can demonstrate that their TTHM and HAA5 disinfection byproduct (DBP) levels are less than 0.064 mg/L and 0.048 mg/L respectively;
- Systems considering a significant change to their disinfection practice must develop a disinfection inactivation benchmark of their existing level of microbial protection and consult with the State for approval prior to implementing the disinfection change;
- Finished water reservoirs for which construction begins after the effective

date of today's rule must be covered; and  
 —Unfiltered systems must comply with updated watershed control requirements that add *Cryptosporidium* as a pathogen of concern.

### G. How Will This Regulation Protect Public Health?

Today's rule for the first time establishes *Cryptosporidium* control requirements for small systems by requiring a minimum 2-log removal for *Cryptosporidium*. The rule also strengthens filter performance requirements to ensure 2-log *Cryptosporidium* removal, establishes individual filter monitoring to minimize contaminant pass-through and support improved performance, includes *Cryptosporidium* in the definition of GWUDI, and explicitly considers unfiltered system watershed control provisions. Today's rule also reflects a commitment to the importance of maintaining existing levels of microbial protection in public water systems as plants take steps to comply with newly applicable DBP standards. Systems considering significant changes to their disinfection practices must first evaluate current levels of *Giardia* inactivation (and virus inactivation if applicable) and consult with their State Primacy Agency for approval before implementing those changes to assure that current microbial protection is not significantly reduced. Thus, compliance with the provisions of today's rule will improve public health protection by reducing the risk of exposure to *Cryptosporidium* in small systems serving fewer than 10,000 people even as those systems begin to take steps to comply with related DBP standards.

## II. Background

### A. What Is the Statutory Authority for the LT1ESWTR?

The Safe Drinking Water Act (SDWA or the Act), as amended in 1986, requires EPA to publish a maximum contaminant level goal (MCLG) for each contaminant which in the judgement of the EPA Administrator, may have an adverse effect on the health of persons, occurs in public water systems with a frequency and at a level of public health concern, and whose regulation would represent a meaningful public health risk reduction (Section 1412(b)(1)(A)). MCLGs are non-enforceable health goals to be set at a level at which no known or anticipated adverse effect on the health of persons occur and which allows an adequate margin of safety (Section 1412(b)(4)). The Act was again