

technologies could experience a reduction in the level of virus and/or *Giardia lamblia* (for chloramines) treatment it is achieving. Consequently, EPA believes that systems making significant changes in their disinfection practice under the Stage 2 M-DBP rules should assess the impact of these changes with disinfection benchmarks for *Giardia lamblia* and viruses.

Changes in the proposed benchmarking requirements under the LT2ESWTR in comparison to IESWTR requirements include decreasing the frequency of calculating CT values for the disinfection profile from daily to weekly and requiring all systems to prepare a profile for viruses as well as *Giardia lamblia*. The proposal of a weekly frequency for CT calculations was made to accommodate existing profiles from small systems, which are required to make weekly CT calculations for profiling under the LT1ESWTR. As described earlier, EPA would like for systems that have prepared a disinfection profile under the IESWTR or LT1ESWTR and have not subsequently made significant changes in disinfection practice to be able to grandfather this profile for the LT2ESWTR. Allowing weekly calculation of CT values under the LT2ESWTR will make this possible.

The IESWTR and LT1ESWTR required virus inactivation profiling only for systems using ozone or chloramine as their primary disinfectant. However, as noted earlier, EPA has projected that under the Stage 2 DBPR and LT2ESWTR, systems will switch from free chlorine to disinfection processes like chloramines, UV, ozone, and microfiltration. The efficiency of these processes for virus treatment relative to protozoa treatment is lower in comparison to free chlorine. As a result, a disinfection benchmark for *Giardia lamblia* would not necessarily provide an indication of the level or adequacy of treatment for viruses. Consequently, EPA believes it is appropriate for systems to develop profiles for both *Giardia lamblia* and viruses. Moreover, developing a profile for viruses involves a minimal increase in effort and no additional data collection for those systems that have disinfection profiles for *Giardia lamblia*. Systems will use the same calculated CT values for viruses as would be used for the *Giardia lamblia* profile.

The strategy of disinfection profiling and benchmarking stemmed from data provided to the Stage1 M-DBP Advisory Committee, in which the baseline of microbial inactivation (expressed as logs of *Giardia lamblia* inactivation) demonstrated high variability.

Inactivation varied by several logs (*i.e.*, orders of magnitude) on a day-to-day basis at particular treatment plants and by as much as tens of logs over a year due to changes in water temperature, flow rate, seasonal changes, pH, and disinfectant demand. There were also differences between years at individual plants. To address these variations, M-DBP stakeholders developed the procedure of profiling a plant's inactivation levels over a period of at least one year, and then establishing a benchmark of minimum inactivation as a way to characterize disinfection practice.

Benchmarking of inactivation levels, an assessment of the impact of proposed changes on the level of microbial inactivation of *Giardia lamblia* and viruses, and State review prior to approval of substantial changes in treatment are important steps in avoiding conditions that present an increase in microbial risk. In its assessment of the microbial risk associated with the proposed changes, States could consider site-specific knowledge of the watershed and hydrologic factors as well as variability, flexibility and reliability of treatment to ensure that treatment for both protozoan and viral pathogens is appropriate.

EPA emphasizes that benchmarking is not intended to function as a regulatory standard. Rather, the objective of the disinfection benchmark is to facilitate interactions between the States and systems for the purpose of assessing the impact on microbial risk of proposed significant changes to current disinfection practices. Final decisions regarding levels of disinfection for *Giardia lamblia* and viruses beyond those required by the SWTR that are necessary to protect public health will continue to be left to the States. For this reason EPA has not mandated specific evaluation protocols or decision matrices for analyzing changes in disinfection practice. EPA, however, will provide support to the States in making these analyses through the issuance of guidance.

### 3. Request for Comments

EPA requests comment on the proposed provisions of the inactivation profiling and benchmarking requirement.

#### *E. Additional Treatment Technique Requirements for Systems With Uncovered Finished Water Storage Facilities*

##### 1. What Is EPA Proposing Today?

EPA is proposing requirements for systems with uncovered finished water

storage facilities. The proposed rule requires that systems with uncovered finished water storage facilities must (1) cover the uncovered finished water storage facility, or (2) treat storage facility discharge to the distribution system to achieve a 4 log virus inactivation, unless (3) the system implements a State-approved risk mitigation plan that addresses physical access and site security, surface water runoff, animal and bird waste, and ongoing water quality assessment, and includes a schedule for plan implementation. Where applicable, the plans should account for cultural uses by Indian Tribes.

Systems must notify the State if they use uncovered finished water storage facilities no later than 2 years following LT2ESWTR promulgation. Systems must cover or treat uncovered finished facilities or have a State-approved risk mitigation plan within 3 years following LT2ESWTR promulgation, with the possibility of a two year extension granted by States for systems making capital improvements. Systems seeking approval for a risk mitigation plan must submit the plan to the State within 2 years following LT2ESWTR promulgation.

These provisions apply to uncovered tanks, reservoirs, or other facilities where water is stored after it has undergone treatment to satisfy microbial treatment technique requirements for *Giardia lamblia*, *Cryptosporidium*, and viruses. In most cases, this refers to storage of water following all filtration steps, where required, and primary disinfection.

##### 2. How Was This Proposal Developed?

Today's proposal is intended to mitigate the water quality degradation and increased health risks that can result from uncovered finished water storage facilities. In addition, these proposed requirements for uncovered finished water storage facilities are consistent with recommendations of the Stage 2 M-DBP Advisory Committee in the Agreement in Principle (USEPA 2000a).

The use of uncovered finished water storage facilities has been questioned since 1930 due to their susceptibility to contamination and subsequent threats to public health (LeChevallier *et al.* 1997). Many potential sources of contamination can lead to the degradation of water quality in uncovered finished water storage facilities. These include surface water runoff, algal growth, insects and fish, bird and animal waste, airborne deposition, and human activity.