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# FACT SHEET

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## Disinfection Profiling and Benchmarking for LT1ESWTR

*The Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) requires small surface water systems that serve a population of less than 10,000 to evaluate their disinfection practices and work with the Ohio EPA to assure there are no unintended reductions in microbial protection if current disinfection practices are changed.*

### IS YOUR SURFACE WATER SYSTEM AFFECTED?

Your public water system (PWS) is affected by the profiling and benchmarking requirements under the LT1ESWTR regardless of disinfection and filtration treatment if all of the following are met:

- A surface water system, or the director designates a groundwater system as a surface water source (GWUDI) in accordance to rule 3745-81-76; and
- A community or nontransient noncommunity public water system; and
- A public water system that serves a population of less than 10,000, or all other community or nontransient noncommunity surface water systems that were not subject to do a disinfection profile by the Interim Enhanced Surface Water Treatment Rule.

### WHAT MUST YOUR SURFACE WATER SYSTEM DO?

Your surface water system has the option to request Ohio EPA to determine that a disinfection profile is unnecessary because of low levels of total trihalomethanes (TTHM) and haloacetic acids (HAA5) in the distribution system. Otherwise, your surface water system must begin at least 52 weeks of disinfection profiling no later than:

- July 1, 2003 for systems serving 500-9,999 people; or
- January 1, 2004 for systems serving less than 500 people.

To demonstrate low levels of TTHM and HAA5 —

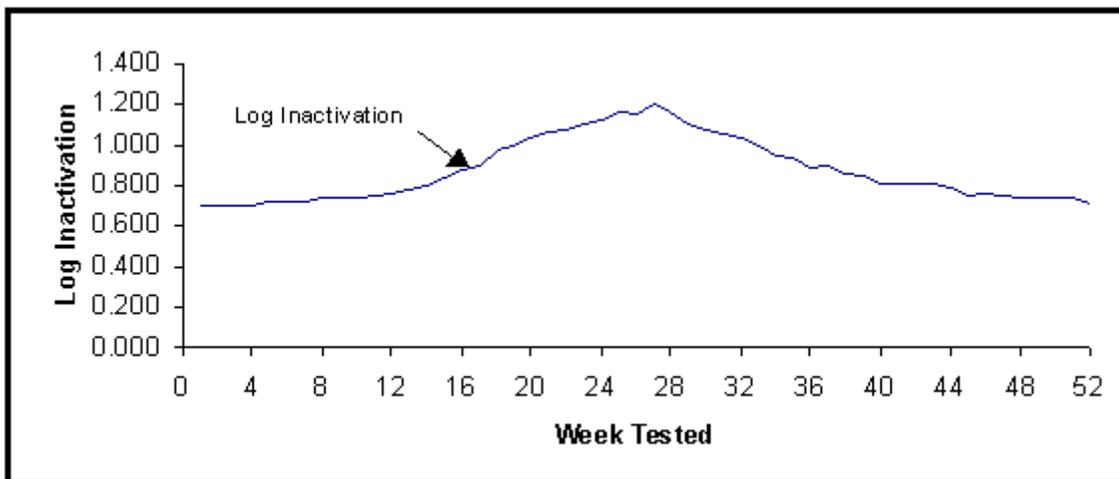
- Your sample data must indicate TTHM concentrations are less than 0.064 mg/L and HAA5 concentrations are less than 0.048 mg/L. Both samples must be collected during the July - September quarter at the point of maximum residence time in the distribution system.
- Existing data may be used if the samples had been collected during the July - September quarter from 1998 - 2001 and at the point of maximum residence time in the distribution system.

- For community surface water systems, the samples that are collected during 2002 and 2003 in accordance with your disinfection byproducts monitoring schedule may be used instead of taking additional samples to determine if disinfection profiling is required. The TTHM and HAA5 samples should both be taken at the same time and location.

If your surface water system does not collect TTHM and HAA5 data, or the TTHM concentrations are greater than 0.064 mg/L or the HAA5 concentrations are greater than 0.048 mg/L, then your water system must do a disinfection profile. In addition, surface water systems may request that the Ohio EPA accept a more representative data set for disinfection profiling because of situations such as if the plant is under construction for substantial improvements.

**WHAT IS A DISINFECTION PROFILE?**

A disinfection profile provides an evaluation of your disinfection practices. A disinfection profile is a summary of *Giardia lamblia* inactivation through the treatment plant each week for a period of at least 52 weeks.



**Example of Disinfection Profile**

**HOW IS A DISINFECTION PROFILE DEVELOPED?**

Inactivation values for the disinfection profile are calculated from operational data collected weekly, on the same day each week, over the course of at least 52 weeks. For water systems that have only post filter chlorination, the Ohio EPA MOR 5109 has the daily measurements of the parameters required to determine the disinfection profile and benchmark.

The following data used for CT calculations must be collected during peak hourly flow:

- ▶ The disinfectant residual concentration (“C”, in mg/L) collected before or at the first customer, and at each point of disinfection;
- ▶ Contact time (“T”, in minutes); and
- ▶ Data collected at each residual disinfectant concentration sampling point:
  - Water temperature (°C); and
  - pH (unless not using chlorine)

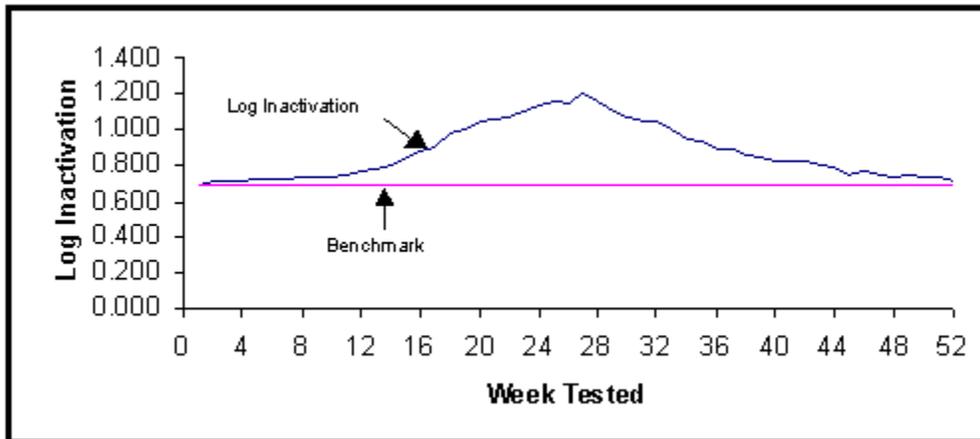
Then, calculate the total *Giardia* inactivation ratio and multiply the value by 3.0 to determine the log inactivation through the treatment plant. The total *Giardia* inactivation ratio is calculated as follows.

Total <i>Giardia</i> Inactivation Ratio	
If your system	Then, Your System Must Determine
(a) Uses only one point of disinfectant application.	(a) One inactivation ratio ( $CT_{calc}/CT_{99.9}$ ) before or at the first customer during peak hourly flow.  <p style="text-align: center;"><b>or</b></p> (b) Successive $CT_{calc}/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, your system must calculate the total inactivation ratio by determining ( $CT_{calc}/CT_{99.9}$ ) for each sequence and then adding the ( $CT_{calc}/CT_{99.9}$ ) values together to determine ( $3.0 \times CT_{calc}/CT_{99.9}$ ).
(b) Uses more than one point of disinfectant application before the first customer.	The ( $CT_{calc}/CT_{99.9}$ ) value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow.

As an example, if only using post filter chlorination, the  $CT_{calc}$  and  $CT_{0.5 Log}$  as reported in the MOR 5109, then the *Giardia* log inactivation is:  $0.5 \times CT_{calc} \div CT_{0.5 Log}$  (the required CT for 0.5 Log inactivation).

**WHAT IS A DISINFECTION BENCHMARK?**

A disinfection benchmark provides the information necessary to assure that any significant change to the current disinfection practice does not significantly decrease microbial inactivation (pathogens killed by disinfection). A disinfection benchmark is the calculation of the lowest monthly average of *Giardia* log inactivation using the data collected for the disinfection profile. A disinfection benchmark is used as a reference point for consultations with the Ohio EPA to evaluate proposed disinfection practice changes.



Example of Disinfection Profile with Benchmark

**WHO MUST DETERMINE A DISINFECTION BENCHMARK?**

A disinfection benchmark must be determined by your water system if:

- You had to develop a disinfection profile; and
- You are considering making a significant change to your disinfection practice which includes: any changes to the point of disinfection; disinfectants used; disinfection process; or any other modification identified by the director that may adversely affect the microbiological inactivation or removal. Such modification may include a substantial change that is proposed in a general plan. Additionally, such modification may require plan approval.

**WHAT MUST MY WATER SYSTEM DO IF WE ARE CONSIDERING A SIGNIFICANT CHANGE TO DISINFECTION PRACTICES?**

Your water system must consult with the Ohio EPA and submit all of the following information:

- ✓ A description of the proposed change;
- ✓ The disinfection profile and benchmark;
- ✓ An analysis of how the proposed change will affect the current levels of disinfection; and
- ✓ The water system must retain disinfection profile data in graphic form, such as a spreadsheet, or in some other format for review as part of a sanitary survey.

**WHERE CAN I GET MORE INFORMATION ON DISINFECTION PROFILING AND BENCHMARKING?**

For more information, call the Ohio EPA district office, or call the Safe Drinking Water Hotline at (800) 426-4791 or, visit the USEPA website, [www.epa.gov/safewater/mbdp/lt1eswtr.html](http://www.epa.gov/safewater/mbdp/lt1eswtr.html).

Northwest District Office	(419)352-8461
Northeast District Office	(330)963-1200
Southwest District Office	(937)285-6357
Southeast District Office	(740)385-8501
Central District Office	(614)728-3778

