

Surface Water Treatment Rules

- Residual Disinfectant Monitoring
- Unfiltered Surface Water Systems
- IESWTR and LT1ESWTR Main Components

Surface Water Treatment Rule (SWTR)

- Turbidity requirements
- Disinfectant residual monitoring
- Avoidance criteria filtration

Residual Disinfectant Monitoring



Residual Disinfectant Monitoring: SWTR

- Entry point and distribution residual disinfectant monitoring
- Another barrier to reduce waterborne diseases
- Protect distribution system water quality

Residual Disinfectant Monitoring -- Entry Point

- Residual disinfectant entering the distribution system must be monitored continuously
 - If equipment fails - grab samples
 - @ 4 hours, 5 days max
 - Small systems - grab samples are acceptable

Residual Disinfectant Monitoring -- Entry Point

- Entry Point Monitoring for Small PWSs

Population	Residual Samples/Day
< 500	1
501 – 1,000	2
1,001 – 2,500	3
2,501 – 3,300	4

Residual Disinfectant Monitoring -- Entry Point

- Residual cannot be **< 0.2 mg/l** for more than 4 hours
 - Treatment technique violation
 - For systems using grab samples - if the residual falls below 0.2 mg/l grab samples must be collected every 4 hours until the concentration is back to 0.2 mg/l

Residual Disinfectant -- Distribution System

- Must monitor residual at the same time and place as coliforms
- HPC may be monitored in lieu of disinfectant residual
 - HPC \leq 500 cfu/ml is considered "detectable"

Residual Disinfectant -- Distribution System

- Distribution system residual cannot be undetectable in **> 5%** of monthly samples for any 2 consecutive months
 - Unless the failure was not caused by a deficiency in treatment of the source water

Residual Disinfectant -- Distribution System

$$V = \frac{c + d + e}{a + b} \times 100$$

- a – residual measurements
- b – no residual meas., but HPC
- c – residual no detect, no HPC
- d – residual no detect, HPC > 500
- e – no residual meas., HPC > 500

Residual Disinfectant -- Reporting

- Must report residual disinfectant measurements the tenth of each month
 - Lowest daily entry point residual
 - Date and duration when entry point residual less than 0.2 mg/l and when state was contacted
 - "V" for distribution system for current and previous month

Criteria for Avoiding Filtration



Criteria for Avoiding Filtration: SWTR

- To avoid filtration a system must meet specific:
 - Source water quality conditions
 - Site-specific conditions

Monitoring Requirements



- Turbidity
 - Location – before disinfection
 - Every 4 hours
 - Continuous monitoring may be substituted

Source Water Quality Conditions

- Turbidity cannot exceed 5 NTU in any readings on 2 consecutive days
 - 2 events in past 12 months or
 - 5 events in past 10 years
 - State must determine that the event was caused by unusual and unpredictable circumstances

Source Water Quality Conditions

- Total coliforms \leq 100/100 ml
Or
- Fecal coliforms \leq 20/100 ml
 - In at least 90% of the measurements made for the previous 6 months
 - If both are measured, the fecal criterion must be met

Monitoring Requirements

Persons Served	Fecal or TC Samples/Week
< 500	1
501 – 3,300	2
3,301 – 10,000	3
10,001 – 25,000	4
> 25,000	5

Site-Specific Conditions

- Compliance with disinfection requirements
- Watershed control program
- Annual on-site inspection
- Can not be identified as a source of waterborne disease outbreak
- Compliance with TCR
- Compliance with Stage 1 DBPR

Site Specific Conditions- Watershed Control

- SWTR
 - Must be maintained to minimize contamination by *Giardia lamblia* and viruses
- IESWTR and LT1ESWTR
 - Must be maintained to minimize contamination by *Cryptosporidium*

IESWTR and LT1ESWTR

- IESWTR
 - Applies to systems $\geq 10,000$
 - Promulgated December 16, 1998
- LT1ESWTR
 - Applies to systems $< 10,000$
 - Promulgated January 14, 2002

IESWTR and LT1ESWTR - MAIN COMPONENTS

- All systems that provide filtration must provide 2-log *Cryptosporidium* removal
 - Conventional and Direct
 - Slow Sand and Diatomaceous Earth
 - Alternative Systems

**IESWTR and LT1ESWTR -
MAIN COMPONENTS**

- Systems that do not provide filtration must include control of *Cryptosporidium* in watershed control plan
 - LT1 systems - January, 2005

**IESWTR and LT1ESWTR -
MAIN COMPONENTS**

- Disinfection profiling and benchmarking requirements
 - LT1 systems- June, 2003

**IESWTR and LT1ESWTR -
MAIN COMPONENTS**

- Systems may not construct new uncovered finished water reservoirs

**IESWTR and LT1ESWTR -
MAIN COMPONENTS**

- GWUDI definition now includes *Cryptosporidium*

**IESWTR and LT1ESWTR -
MAIN COMPONENTS**

- Sanitary surveys
 - Frequency (3 or 5 years)
 - Eight essential elements
 - System response to significant deficiencies
