Water Treatment Overview

Historical Perspective:

1. Surface Water Treatment Rule (SWTR):
   - Effective in 1993
   - Required surface water treatment plants to meet a finished water turbidity of ≤0.5 NTU, 95% of the time and to meet CT (concentration * time) for disinfection.
   - It was determined that filtration and disinfection requirements were insufficient for removal/ inactivation of *cryptosporidium* which lead to the IESWTR.

2. Interim Enhanced Surface Water Treatment Rule (IESWTR):
   - Promulgated in 11/1998, went into effect in 1/2002 for plants serving 10,000 or more customers.
   - Long-Term 1 ESWTR affected all plants, regardless of population served, in 1/2005.
   - Requires plants to achieve a finished water turbidity of ≤0.3 NTU, 95% of the time.
   - Requires continuous on-line turbidimeters on individual filters.

Louisiana Optimized Performance Goals:

3. The goal of water treatment is to provide multiple barriers against the passage of cysts and viruses into the distribution system on a continuous basis. Any instantaneous failure represents a possible threat to public health. Micro-organisms (such as *cryptosporidium*) are extremely resistant to disinfection. This necessitates optimizing physical removal, as well as chemical inactivation of pathogens. Chlorine cannot act as the only barrier to the passage of cysts and viruses. To achieve optimized performance and to provide the maximum protection to public health, the following goals are required.

a. Minimum data monitoring requirements:
   - Daily raw water turbidity
   - Settled water turbidity at 4-hour increments from sedimentation basin
   - Continuous on-line turbidimeter on individual filters
   - Monthly filter post-backwash profile for each filter

b. Individual Sedimentation Basin Performance Goals:
   - Settled water turbidity of < 1 NTU when annual average raw water turbidity is ≤10 NTU
   - Settled water turbidity of < 2 NTU when annual average raw water turbidity is >10 NTU

c. Individual Filter Performance Goals:
   - Initiate filter backwash before turbidity of individual filter exceeds 0.10 NTU
   - Filtered water turbidity (for plants with filter-to-waste capability) of ≤0.10 NTU, 95 % of time based on maximum values recorded during 4-hour time increments
   - Filtered water turbidity (for plants without filter-to-waste capability) of ≤0.10 NTU, 95 % of time (excluding 15-minute period following backwash), based on maximum values recorded during 4-hour time increments
   - Maximum filtered water turbidity following backwash of 0.3 NTU (for plants without filter-to-waste capability), returning to ≤0.10 NTU within 15 minutes

d. Disinfection:
   - CT values to achieve required log inactivation of Giardia and viruses.