

Regulatory Compliance Evaluation

The inherent complexity of recently proposed and promulgated regulations can make it difficult to understand their implications on water treatment plant (WTP) operations. Carollo Engineers' expertise in WTP processes and their impact on water quality and regulatory compliance make the Regulatory Review a key component of the Water System Assessment (WSA). During the Regulatory Review, the most up-to-date regulatory information will be summarized and tailored to the plant's needs and challenges. This step will include a thorough review of the historical plant performance data and its standing with regard to current and future regulations. The purpose of combining these components is to provide plant personnel with site-specific information pertaining to their plant's operation and future needs.

The figure below provides a graphical depiction of the proposed promulgation, compliance, and implementation dates. A brief description of potential regulations pertinent to the Regulatory Compliance Evaluation is provided on the following page.

Existing Regulations

Perhaps the most significant regulations affecting drinking water producers are the Microbial and Disinfection By-Product (M/DBP) Rules. The goal of these regulations is to provide public protection against microbial pathogens while ensuring minimal health risks from DBPs. The result of these regulations is that utilities are required to augment disinfection to protect consumers against pathogens, while being limited in their use of chemical disinfectants to prevent excessive DBP formation. Many utilities will need to use multiple barriers (including

multiple disinfectants) to meet their inactivation goals without exceeding DBP limits. The key regulations of interest are as follows:

Interim Enhanced Surface Water Treatment Rule (IESWTR)

This rule established removal requirements for *Cryptosporidium*, turbidity performance standards, disinfection profiling and benchmarking, covers on new finished water reservoirs, as well as sanitary surveys in public water systems that use surface water or ground water under the direct influence of surface water and serve $\geq 10,000$.

Long Term 1 ESWTR (LT1ESWTR)

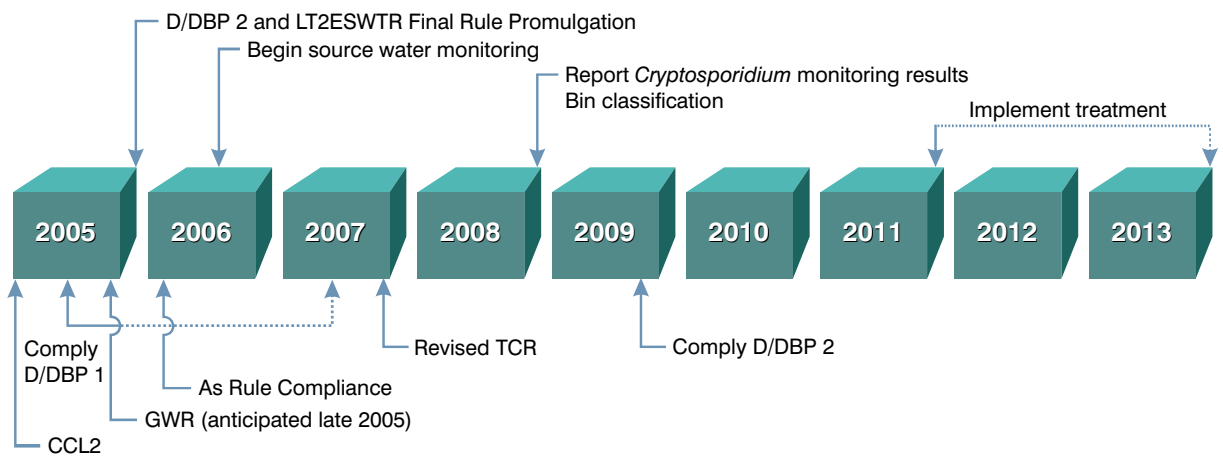
This rule extended the requirements of the IESWTR to public water systems serving fewer than 10,000 persons.

Stage 1 Disinfectants and Disinfection By-Products (D/DBP) Rule

The purpose of the Stage 1 D/DBPR is to improve public health protection by reducing exposure to disinfection by-products. Surface water systems and ground water systems under direct influence serving more than 10,000 people were required to comply by January 1, 2002. The main provisions of the regulation set the maximum contaminant level (MCL) for total four trihalomethanes (TTHM) at $80 \mu\text{g/L}$ and for the five regulated haloacetic acids (HAA5) at $60 \mu\text{g/L}$.

Arsenic Rule

This rule reduced the arsenic MCL from $50 \mu\text{g/L}$ to $10 \mu\text{g/L}$.



Regulatory timeline.

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Future Regulations

There are a number of areas in which future regulations are expected, including more stringent MCLs for currently regulated contaminants and MCLs for new contaminants. The following is a summary of anticipated developments in a number of areas.

Stage 2 D/DBP Rule

Recognizing that TTHM and HAA5 concentrations vary over time and space in distribution systems, this rule modifies DBP monitoring requirements, but does not affect maximum residual disinfectant levels, nor THM4 and HAA5 maximum contaminant levels (MCLs).

LT2ESWTR

This rule is in draft form only. It mainly requires increased treatment for *Cryptosporidium* based on source water levels of this pathogen. This regulation is particularly significant for UV, as it is the first regulation to include UV as a disinfection option for protozoa. A draft *UV Disinfection Guidance Manual*, which Carollo significantly contributed to, was recently released in conjunction with the proposed rule.

Disinfection By-Products

Several changes to DBP regulations are anticipated for the long-term future. The bromate MCL is expected to be reduced from 10 $\mu\text{g/L}$ to 5 $\mu\text{g/L}$. In addition, several changes are being considered to the regulations affecting TTHMs and HAAs, including possible individual MCLs for each DBP species, regulation of individual chemical species, and regulation of additional HAAs. Changes to the chlorite MCL are not anticipated; however, it is likely that an MCL for chlorate (another by-product of chlorine dioxide) will be introduced in the future. In addition, there are several “emerging” DBPs that may be regulated in the future, including N-nitrosodimethylamine (NDMA), which already has an action level of 0.01 $\mu\text{g/L}$ in California.

Microbial Inactivation

The USEPA is currently evaluating several pathogens that may be regulated in the future. USEPA's Contaminant Candidate List presents priority contaminants to be considered for USEPA's drinking water program. This list has 10 microorganisms, including *Helicobacter pylori*, adenovirus, and *Mycobacterium avium intercellulare* (MAC). *H. pylori* and MAC are also on List 3 of the Unregulated Contaminant Monitoring Rule (UCMR).

Xenobiotic Compounds

Xenobiotic (man-made) compounds include endocrine disruptors (EDCs), and pharmaceuticals and personal care products. These compounds are the subject of much research and are strong candidates for future regulation. Due to the large number of potential compounds, the USEPA may choose to regulate them based on surrogate parameters (e.g., estrogenicity) rather than MCLs, or introduce additional treatment requirements. USEPA is currently in the process of screening suspected EDCs amongst identified xenobiotic compounds present in surface waters. Based on this screening, USEPA will develop a prioritized list of EDCs. This list will form the basis for the development of surface water quality criteria—MCLs or surrogates.

Ground Water Rule

This rule will establish disinfection requirements against microbiological contamination for ground water systems. This rule is expected to be promulgated in December 2005.