

IDSE: A NEW TASK FOR WATER SYSTEM MANAGERS

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At the beginning of this year the EPA published the Stage 2 Disinfectants and Disinfection Byproducts Rule (DBPR) in the Federal Register (71 FR 388). The DBPR is part of the regulatory body growing out of the Safe Drinking Water Act which was initially enacted in 1974. Stage 2 DBPR builds on previous regulations (primarily Stage 1 DBPR) which require water systems to meet disinfection byproducts maximum contaminant levels (MCL). A key issue is that the regulations require compliance at each monitoring site in the distribution system which may take some additional effort by the water system.

There are two components of the new rule of which utility managers should take special note, Subparts U and V. Subpart U outlines the applicability and requirements for performing an **Initial Distribution System Evaluation (IDSE)** while Subpart V discusses the expansion of the Compliance Monitoring associated with Disinfectant/Disinfection Byproducts in the water distribution system. This brief article will outline some of the primary features of the IDSE section, because its compliance tasks are a little different than what is usually part of a monitoring rule.

Recall that the DBPR was initiated because a number of epidemiological studies pointed to a computed increase in chronic health effects from drinking water which contained elevated levels of disinfection byproducts. While these studies indicate only a weak association with the disinfection byproducts and adverse health effects, the fact that roughly 260 million people are exposed to these chemicals in public drinking water makes the potential health risks worthy of attention. Because the vast majority of water systems used gaseous chlorine to disinfect their supplies, attention was focused initially on the reaction products formed when chlorine was mixed with naturally-occurring organic material. The level of byproduct formation is variable through the year and is primarily related to water temperature and pH, seasonal water demand, amount of disinfectant added, the amount of organic material in the water and configuration of the water system. The primary regulatory parameters of concern here are the Total Trihalomethanes (TTHM) and the Five Haloacetic Acids (HAA5). Chloroform, Bromodichloromethane, Dibromochloromethane, and Bromoform comprise the TTHM list, while the HAA5 group consists of Monochloroacetic acid, Dichloroacetic acid, Trichloroacetic acid, Bromoacetic acid and Dibromoacetic acid. The current MCL for TTHM is 0.080 mg/L and 0.060 for HAA5.

WHO MUST COMPLY WITH THE RULES?

This rule applies to all water systems that are classified as Community Water Systems (CWS) of any size or Non-transient Non-community Water Systems (NTNCWS) serving 10,000 people or more which disinfects by any means other than ultraviolet light. NTNCWS serving less than 10,000 people are exempt from the IDSE although other provisions of the Stage 2 DBPR may apply. Transient Non-community Water Systems or individual water supplies are completely exempt from Stage 2 DBPR requirements. Note that a CWS is a public water system that serves at least 15 service connections or an average of at least 25 residents on a year-around basis. Examples of this type of system would be a city, subdivision, or mobile home park. An NTNCWS is a water system that serves at least 25 of the same people more than six months of the year (but not as a primary residence). Schools, businesses, and day care facilities are examples of an NTNCWS.

WHAT DOES THE RULE REQUIRE?

Under Subpart U of the rule, the utility will conduct an evaluation of their distribution system to identify locations where TTHM and/or HAA5 concentrations that are at their highest levels. This one-time study is known as the Initial Distribution System Evaluation. Once the IDSE is completed, the monitoring sites identified will be used for Stage 2 DBPR compliance monitoring.

Fortunately for system operators, the fact that a particular reading exceeds an MCL does not necessarily mean that the system is out of compliance. The criteria for measuring against the MCL are not individual readings, but rather an annual running average. The difference with Stage 2 DBPR, however, is that the running annual averages are based on each sampling location as opposed to a pooled running average of all monitoring locations across the system. In other words, the new rules require compliance on a Locational Running Annual Average (LRAA) basis.

Using this data, each system must determine if they have exceeded an operational evaluation level. A system that exceeds these criteria is deemed to be at risk for future violations of the MCL, and thus using this procedure will give the utility the opportunity to address deficiencies or other positive steps to remain in compliance. A state reporting obligation exists to identify actions to be taken which will mitigate the occurrence of future high disinfection byproduct levels, especially those that could cause a violation of the actual MCLs. It should be noted that any time the LRAA exceeds the MCL, prompt action is warranted at that point in time.

HOW DO I COMPLY WITH THE IDSE PORTION OF THE RULE?

Actually there are four means by which compliance with the IDSE portion of the rule can be satisfied, although all four options are not available to all systems. Upon confirming that the system uses some form of disinfection other than UV light, there are two variables which determine the general categories for testing and compliance. To select among the options available, a utility manager must classify the system by:

- a) Populations served
- b) Water source type (Surface water or Groundwater)

The population served by the utility is the primary variable which determines the schedule for submission of the IDSE and the level of detail required. The system size and water source type determine the minimum number of samples that are required from the data pool upon which to base the analysis.

Overview of IDSE Options

There are four options that can be used to comply with the IDSE requirement. Selection among the options will be based on system size, technical resources available, existing monitoring results and manager preference. The following is a brief description of the four options.

Qualify for a Very Small System (VSS) Waiver

For small CWS serving less than 500 people and that have TTHM and HAA5 data, a VSS is automatically granted unless they are notified by the Florida Department of Environmental Regulation (FDEP) or EPA that they must conduct an IDSE. Systems that receive a VSS have no further obligations under the IDSE requirements, although they should continue their Stage 1 Compliance Monitoring until required to begin Stage 2 monitoring per the schedule indicated in the DBPR.

Meet 40/30 Certification requirements

For those systems that can demonstrate that all individual TTHM and HAA5 results for Stage 1 DBPR 2-year compliance monitoring have been equal to or less than 0.040 mg/L and 0.030 mg/L, respectively, further IDSE requirements can be waived. To comply with IDSE regulations, however, a certification letter must be prepared to document this level of operation and must be submitted within the prescribed period. A template for the certification letter is provided in the EPA documentation. Once the certification is submitted, there are no further requirements under the IDSE portion of the rule, but continued compliance monitoring is required in accordance with the Stage 1 and Stage 2 DBPR schedule.

Conduct a System Specific Study (SSS)

A third option for meeting the IDSE requirement is by use of computer hydraulic models of the distribution system, or by using existing monitoring results if they meet certain minimum criteria. These sub-options are typically mutually exclusive. They both require that a plan of study be submitted. Subsequently, a final report is prepared and submitted as the IDSE. However, it is noted that in certain instances if enough data is present, the plan of study and IDSE report can be submitted simultaneously. Systems that have calibrated computer hydraulic or water quality models are able to more easily focus their efforts and scan their systems for optimal monitoring points.

Conduct Standard Monitoring

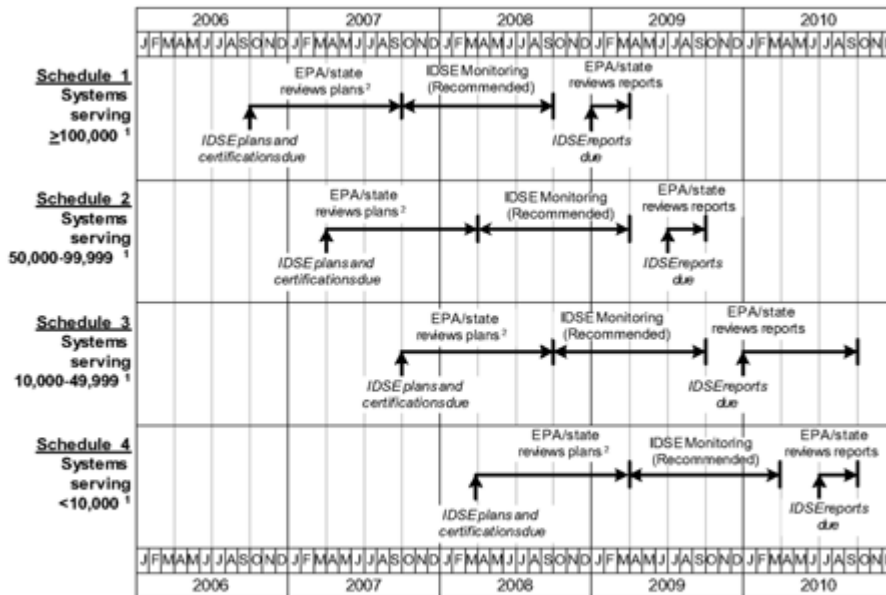
The standard monitoring plan approach to compliance requires that an additional 1-year of sampling within the distribution system occurs at multiple locations (in addition to Stage 1 sampling). The required frequency and minimum number of samples are stipulated within the regulations and are governed by the population served by the system and the source water

type. As would be expected, surface water supplies require more samples than groundwater supplies. A sampling plan is required to document the methodology of the monitoring process. An IDSE report follows the completion of the monitoring effort.

WHEN DOES COMPLIANCE WITH THE IDSE REQUIREMENT NEED TO BE COMPLETED?

The compliance schedule for this program is on a staggered basis, with larger systems filing first and smaller systems given more time. In fact systems serving over 100,000 people are scheduled to submit their IDSE plans or certifications by October 1, 2006. Figure 1 is provided below to give an indication of the schedules associated with different sized systems. As a side note, a record of IDSE documentation must be maintained by the utility for at least 10 years.

Figure 1



¹ For consecutive and wholesale systems, the schedule is based on the population served by the largest system in a combined distribution system.
² Communication with the system is included in the EPA/state review period.

WHERE CAN I GO FOR MORE INFORMATION?

For those responsible for managing compliance with these new rules, the EPA has issued a number of guidance documents and summaries. The most comprehensive document to address the IDSE and the compliance requirements is the Initial Distribution System Evaluation Guidance Manual. This and other information resources can be accessed from the EPA’s website at <http://www.epa.gov/safewater/disinfection/stage2/compliance.html>. The EPA has also developed an online IDSE compliance tool to help managers determine which compliance option is available to them. Of course, the engineers at Chastain-Skillman, Inc. are also available to help our clients work through this compliance process.

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