The Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) Implementation Guidance

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This document provides guidance to states, tribes, and U.S. Environmental Protection Agency (EPA) Regions exercising primary enforcement responsibility under the Safe Drinking Water Act (SDWA) and contains EPA's current policy recommendations for complying with the Stage 2 Disinfectants and Disinfection Byproducts Rule (DBPR). Throughout this document, the terms "state" or "states" are used to refer to all types of primacy agencies including U.S. territories, Indian tribes, and EPA regions.

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List of Acronyms and Abbreviations

40/30	IDSE 40/30 Certification
AWOP	Area-Wide Optimization Program
BAT	Best Available Technology
CCR	Consumer Confidence Report
CDC	Centers for Disease Control
CFE	Combined Filter Effluent
CFR	Code of Federal Regulations
CT	The Residual Concentration of Disinfectant (mg/L) Multiplied by the Contact Time (in minutes)
CWSs	Community Water Systems
DBPs	Disinfection Byproducts
DBP Precursors	Disinfection Byproduct Precursors
DCTS	Data Collection and Tracking System
DOC	Dissolved Organic Carbon
DWA	Drinking Water Academy
EA	Economic Analysis
EPA	U.S. Environmental Protection Agency
EPS	Extended Period Simulation
FBRR	Filter Backwash Recycling Rule
FRDS	Federal Reporting Data System
GWUDI	Ground Water Under the Direct Influence of Surface Water
HAA5	Haloacetic Acids (Monochloroacetic, Dichloroacetic, Trichloroacetic, Monobromoacetic and Dibromoacetic Acids)
HPC	Heterotrophic Plate Count
HQ	Headquarters
IDSE	Initial Distribution System Evaluation
IESWTR	Interim Enhanced Surface Water Treatment Rule
IFE	Individual Filter Effluent
IPMC	Information Processing and Management Center
LRAA	Locational Running Annual Average
LT1ESWTR	Long Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR	Long Term 2 Enhanced Surface Water Treatment Rule
M&R	Monitoring and Reporting
MCAA	Monochloroacetic Acid
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
M-DBP Cluster	Microbial-Disinfectants/Disinfection Byproducts Cluster
MRDL	Maximum Residual Disinfectant Level
MRL	Minimum Reporting Level

NCWS	Noncommunity Water System
NIPDWR	National Interim Primary Drinking Water Regulations
NPDWR	National Primary Drinking Water Regulation
NTNCWS	Nontransient Noncommunity Water System
OECA	Office of Enforcement and Compliance Assurance
OGC	Office of General Counsel
OGWDW	Office of Ground Water and Drinking Water
ORC	Office of Regional Counsel
PN	Public Notification
PWS	Public Water System
PWSS	Public Water System Supervision
RAA	Running Annual Average
SDWA	Safe Drinking Water Act
SDWIS/FED	Safe Drinking Water Information System/Federal
SNC	Significant Non-complier
SSS	System Specific Study
Stage 1 DBPR	Stage 1 Disinfectants and Disinfection Byproducts Rule
Stage 2 DBPR	Stage 2 Disinfectants and Disinfection Byproducts Rule
Subpart H	PWS using surface water or ground water under the direct influence of surface water
SUVA	Specific Ultraviolet Absorbance
SWTR	Surface Water Treatment Rule
TCAA	Trichloroacetic Acid
TCR	Total Coliform Rule
TOC	Total Organic Carbon
TTHM	Total Trihalomethanes (Chloroform, Bromodichloromethane, Dibromochloromethane, and Bromoform)
UV	Ultraviolet Light
VSS	Very Small System

Introduction

This document provides guidance to EPA regions and states exercising primary enforcement responsibility under the Safe Drinking Water Act (SDWA) concerning how the U.S. Environmental Protection Agency (EPA) interprets the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) under the SDWA. It also provides guidance to the public and the regulated community on how EPA intends to exercise its discretion in implementing the statute and regulations. This guidance is designed to implement national policy on these issues.

The SDWA provision and EPA regulations described in this document contain legally binding requirements. This document does not substitute for those provision or regulations, nor is it a regulation itself. It does not impose legally-binding requirements on EPA, states, or the regulated community and may not apply to a particular situation based upon the circumstances. EPA and state decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance, where appropriate. Any decisions regarding a particular facility will be made based on the applicable statutes and regulations. Therefore, interested parties are free to raise questions and objections about the appropriateness of the application of this guidance to a particular situation, and EPA will consider whether or not the recommendations or interpretations in the guidance are appropriate in that situation based on the law and regulations. EPA may change this guidance in the future.

This manual contains the following sections:

- **Section 1** summarizes the rule requirements of the Stage 2 DBPR and presents a timetable of important dates.
- **Section 2** lists the "stand-alone" guidance materials that will help states and public water systems (PWSs) adopt each new requirement.
- **Section 3** discusses state implementation activities.
- **Section 4** covers state primacy revision requirements, including a detailed timeframe for application review and approval. This section also contains guidance and references to help states adopt each new special primacy requirement included in these rules.
- **Section 5** addresses violation determination and associated reporting requirements to assist states in their compliance activities.
- **Section 6** provides examples of violations requiring public notification and sample language to include in Consumer Confidence Reports (CCRs).

The appendices of this document also provide information that will be useful to states and EPA regions throughout the primacy revision application process.

- **Appendix A** contains the primacy revision application crosswalk for the rule.
- **Appendix B** contains the rule language of the Stage 2 DBPR.
- **Appendix C** contains fact sheets and quick reference guides for the rule.
- **Appendix D** presents flowcharts to help states and systems implement the rule.

- **Appendix E** includes a set of forms to help systems complete their Initial Distribution System Evaluations (IDSE) plans and reports.

- **Appendix F** contains various templates for letters that states can tailor to meet their needs.

- **Appendix G** contains guidance materials for states reviewing IDSE plans.

- **Appendix H** contains information about the Data Collection and Tracking System.

- **Appendix I** contains guidance for reviewing extension requests under Section 1412(b)(10) of the Safe Drinking Water Act.

Please note that in several sections the guidance makes suggestions and offers alternatives that go beyond the minimum requirements of the rule. EPA does this to provide information and/or suggestions that may be helpful to implementation efforts. Such suggestions are prefaced by "may" or "should" and are to be considered advisory. They are not required elements of the Stage 2 DBPR.

EPA expects to undertake necessary rule implementation activities during the period of early implementation. During this period, the state may elect to undertake some or all of the implementation activities in cooperation with EPA. This will facilitate continuity of implementation and ensure that system-specific advice and decisions are made with the best available information and are consistent with existing state program requirements.

To provide clarity on who to contact for questions and interactions on Stage 2 DBPR implementation, EPA maintains a point of contact list with states and regional implementation contacts available at EPA's Web site: www.epa.gov/safewater/disinfection/stage2/compliance.html#training. The list is updated periodically as EPA and state roles change.

Section 1

Rule Requirements

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1.1 Introduction

EPA finalized the Stage 2 DBPR in the *Federal Register* on January 4, 2006 (71 *FR* 388; see www.epa.gov/safewater/disinfection/stage2/index.html). This rule is part of a series of rules referred to as the "Microbial-Disinfectants/Disinfection Byproducts Cluster" (M-DBP Cluster). These rules are intended to improve control of microbial pathogens while minimizing public health risks of disinfectants and disinfection byproducts (DBPs). The Stage 2 DBPR builds upon the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) by addressing the health risks of DBPs in community water systems (CWSs) and nontransient noncommunity water systems (NTNCWSs) that add a primary or residual disinfectant other than ultraviolet light (UV) or deliver water that has been treated with a primary or residual disinfectant other than UV. Key provisions of the Stage 2 DBPR include:

- An Initial Distribution System Evaluation (IDSE) to identify compliance monitoring locations that represent high total trihalomethanes (TTHM) and haloacetic acids (HAA5) concentrations throughout the distribution system.

- Use of a locational running annual average (LRAA) calculated for each monitoring location in the distribution system for TTHM and HAA5 to determine compliance with the Stage 2 DBPR maximum contaminant levels (MCLs) for TTHM and HAA5.

The Stage 2 DBPR was developed concurrently with the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), which addresses the control of microbial pathogens. The LT2ESWTR was finalized as a separate rule on January 5, 2006.

1.1.1 History

The 1974 SDWA called for EPA to regulate drinking water by creating the national interim primary drinking water regulations (NIPDWR). In 1979, the first interim standard addressing DBPs was set for total trihalomethanes (TTHM), a group of four volatile organic chemicals that form when disinfectants react with natural organic matter in the water.

1986 SDWA Amendments

Although the SDWA was amended slightly in 1977, 1979, and 1980, the most significant changes to the 1974 law occurred when the SDWA was reauthorized in 1986. To safeguard public health, the 1986 Amendments required EPA to set health goals, or maximum contaminant level goals (MCLGs), and MCLs for 83 named contaminants. Waterborne disease outbreaks of giardiasis demonstrated that disease-causing microbial contamination had not been sufficiently controlled under the original Act. In addition, several hundred chemical contaminants were known to occur in the environment, but few were regulated in PWSs. EPA was also required to establish additional regulations within certain timeframes, require disinfection of source water supplies, specify filtration requirements for nearly all water systems that draw their water from surface sources, and develop additional programs to protect ground water supplies.

In 1989, EPA issued two important National Primary Drinking Water Regulations (NPDWRs): the Total Coliform Rule (TCR) and the Surface Water Treatment Rule (SWTR). The TCR and SWTR provide the foundation for the M-DBP Cluster and are summarized below.

Total Coliform Rule

The TCR applies to all PWSs. Coliforms are easily detected in water and are used to assess a water system's vulnerability to pathogens. It requires systems to sample for coliform bacteria which are used as

an indicator of whether a water system is vulnerable to pathogens. Coliforms are used because they are easily detected in water. In the TCR, EPA set an MCLG of zero for total coliforms. EPA also set an MCL for total coliforms and required testing of total coliform positive cultures for the presence of *E. coli* or fecal coliforms, which indicate more immediate health risks from sewage or fecal contamination. If more than 5.0 percent of the samples contain coliforms within a month, water system operators must report this violation to the state and the public. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Finally, the TCR required sanitary surveys every 5 years (or 10 years for noncommunity water systems (NCWSs) using disinfected and protected ground water) for every system that collects fewer than five routine total coliform samples per month. These are typically systems that serve 4,100 or fewer people.

Surface Water Treatment Rule

PWSs using surface water or ground water under the direct influence of surface water (GWUDI) as a supply are prone to microbial contamination of their source water. Pathogenic microorganisms that can contaminate source water can be removed or inactivated during the water treatment sedimentation, filtration, and disinfection processes. EPA issued the SWTR in response to a Congressional mandate requiring disinfection, and filtration where necessary, of systems that use surface water or GWUDI sources. The rule sets MCLGs for *Legionella*, *Giardia lamblia*, and viruses at zero because any exposure to these contaminants presents some level of health risk. The SWTR includes a treatment technique requirement for inactivation (or removal and inactivation) of these organisms.

Specifically, the SWTR requires that a surface water system have sufficient treatment to reduce source water concentrations of *Giardia lamblia* and viruses by at least 99.9 percent (3.0 log) and 99.99 percent (4.0 log), respectively. In addition, disinfection residuals must be maintained throughout the distribution system. For systems that filter, the adequacy of the filtration process is determined by measuring the turbidity of the treated water since poor turbidity removal often indicates that the filtration process is not working properly. The goal of the SWTR is to reduce the public health risk for infection by *Giardia lamblia*, *Legionella*, or viruses to less than one infection per year per 10,000 people.

The SWTR, however, does not account for systems with high pathogen concentrations in source water that, when treated at the levels required under the rule, still may not meet this health goal. The SWTR also does not specifically control for the protozoan *Cryptosporidium*, as sufficient information about its removal or disinfection was not available at the time the SWTR was finalized. Since the SWTR was promulgated, much has been learned about this organism. Most notably, *Cryptosporidium* is resistant to disinfection practices commonly employed by PWSs. Therefore, physical removal or alternative disinfectants are the most effective treatment methods.

1996 SDWA Amendments

In 1990, EPA's Science Advisory Board, an independent panel of experts established by Congress, cited drinking water contamination as one of the most important environmental risks and indicated that disease-causing microbial contaminants (e.g., bacteria, protozoa, and viruses) are probably the greatest remaining health-risk management challenge for drinking water suppliers. Data from the Centers for Disease Control (CDC) confirm this concern and indicate that between 1980 and 1998, 419 waterborne disease outbreaks were reported, with over 511,000 estimated cases of disease. During this period, a number of agents were implicated as causes of the outbreaks, including various protozoa, viruses, and bacteria, as well as several chemicals (Craun and Calderon 1996, Levy et al. 1998, Barwick et al. 2000). Most of the cases (but not the outbreaks) of illnesses were associated with surface water, including a single outbreak of approximately 403,000 cases of cryptosporidiosis in Milwaukee, WI (Mac Kenzie et al. 1994).

The SDWA was further amended in 1996 to improve public health protection by incorporating new data on the adverse health effects of contaminants, the occurrence of contaminants in PWSs, and the estimated reduction in health risks that would result from further regulation. The Amendments provided for use of best-available, peer-reviewed science in decision-making and for risk reduction and cost analyses in the regulatory decision process.

TTHMs/Stage 1 DBPR/Stage 2 DBPR

Many water systems treat their water with a chemical disinfectant to inactivate pathogens that cause disease. The public health benefits of common disinfection practices are significant and well-recognized; however, disinfection poses risks of its own. While disinfectants are effective at controlling many harmful microorganisms, they react with organic and inorganic matter (DBP precursors) in the water and form DBPs, some of which pose health risks when present above certain levels. Since the discovery of chlorination byproducts in drinking water in 1974, numerous toxicological studies have been conducted that show some DBPs to be carcinogenic and/or cause reproductive or developmental effects in laboratory animals. Additionally, exposure to high levels of disinfectants over long periods of time may cause health problems, including damage to blood and kidneys. While many of these studies have been conducted with disinfectants at high doses, the weight of evidence indicates that DBPs present a potential public health problem that must be addressed to minimize risks from long-term exposure. One of the most complex questions facing water supply professionals is how to reduce risks from disinfectants and DBPs while providing adequate protection against microbial contaminants.

The TTHM Rule of 1979 set a TTHM MCL for CWSs serving 10,000 or more people. The Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) built on the TTHM Rule by lowering existing MCLs and widening the range of affected systems to include all PWSs (except most transient systems) that add a disinfectant. The Stage 1 DBPR established new MCLs for additional DBPs (i.e., chlorite, bromate, and haloacetic acids (HAA5)) as well as established maximum residual disinfection levels (MRDLs) for the disinfectants chlorine, chloramines, and chlorine dioxide. In addition, the Stage 1 DBPR requires conventional filtration systems to remove specified percentages of organic materials, measured as total organic carbon (TOC), which may react with disinfectants to form DBPs.

The Stage 2 DBPR builds upon the Stage 1 DBPR by providing more consistent protection from DBPs across the entire distribution system and by focusing on the reduction of DBP peaks. The Stage 2 DBPR requires systems to conduct an initial distribution system evaluation (IDSE) to identify compliance monitoring locations that represent high TTHM and HAA5 levels. In addition, the Stage 2 DBPR changes the way sampling results are averaged to determine compliance. The determination for the Stage 2 DBPR is based on a locational running annual average (LRAA) (i.e., compliance must be met at *each* monitoring location) instead of the system-wide running annual average (RAA) used under the Stage 1 DBPR. Systems are also required to conduct an operational evaluation if they have DBP levels that exceed the operational evaluation level.

Filter Backwash Recycling Rule

The Filter Backwash Recycling Rule (FBRR) complements the surface water treatment rules by reducing the potential for microbial pathogens, particularly *Cryptosporidium* oocysts, to pass through the filters into the finished water of conventional and direct filtration systems that recycle backwash water. The FBRR requires affected systems to return regulated recycle streams (e.g., spent filter backwash, thickener supernatant, or liquids from dewatering processes) through all processes of a system=s conventional or direct filtration system, unless the state approves an alternate location. In addition, the FBRR requires systems to notify the state in writing about recycle practices and to maintain specific records.

IESWTR/LT1ESWTR/LT2ESWTR

The IESWTR builds on the SWTR by adding protection from *Cryptosporidium* by requiring filtered systems to meet new turbidity standards for combined filter effluent (CFE) and individual filter effluent (IFE). Additionally, the IESWTR requires unfiltered systems to include control of *Cryptosporidium* in their watershed control plans. The IESWTR applies to systems that serve more than 10,000 people. The IESWTR builds on the TCR by requiring sanitary surveys for all PWSs using surface water or GWUDI regardless of size. The IESWTR also requires covers for all new finished water storage facilities and includes disinfection profiling and benchmarking provisions to ensure systems provide continued levels of microbial protection while taking the necessary steps to comply with the DBP standards.

The provisions in the LT1ESWTR address the concerns covered by the IESWTR as they apply to small systems (i.e., systems serving fewer than 10,000 people) using surface water or GWUDI. The LT2ESWTR builds upon the SWTR, IESWTR, and LT1ESWTR by supplementing existing microbial treatment requirements for systems where additional public health protection is needed.

Collectively, the SWTR, IESWTR, LT1ESWTR, and LT2ESWTR place stringent treatment requirements on systems using surface water or GWUDI as a source. Additional information on The LT2ESWTR is available on EPA's Web site: www.epa.gov/safewater/disinfection/lt2/index.html.

The Multiple Barrier Approach

By building on the foundation of the original SDWA, subsequent amendments to the Act have improved the quality of drinking water and increased public health protection. The 1996 SDWA Amendments, for example, require EPA to develop rules to balance the risks presented by microbial pathogens and DBPs.

Since multiple threats require multiple barriers, the LT2ESWTR and Stage 2 DBPR expand on the foundation of the TCR, SWTR, TTHM Rule, Stage 1 DBPR, IESWTR, LT1ESWTR, and FBRR standards to target health risks not addressed by prior regulations. By encompassing these previously unaddressed health risks from microbials and DBPs, the M-DBP Cluster continues to maximize drinking water quality and public health protection.

1.1.2 Development of the Stage 2 DBPR

In March 1999, EPA reconvened the M-DBP Advisory Committee to develop recommendations for the Stage 2 DBPR and LT2ESWTR. This Committee also participated in the development of the IESWTR, LT1ESWTR and Stage 1 DBPR. The Committee's members represented EPA, state, and local public health and regulatory agencies, local elected officials, Native American tribes, drinking water suppliers, chemical and equipment manufacturers, and public interest groups. Technical support for the Committee's discussions was provided by a technical workgroup established by the Committee at its first meeting. The Committee's activities resulted in the collection and evaluation of substantial new information related to key elements for both rules. This included new data on pathogenicity, occurrence, and treatment of microbial contaminants, specifically *Cryptosporidium*, as well as new data on DBP health risks, exposure, and control. The Committee held ten meetings (from September 1999 to July 2000), to discuss issues pertaining to the Stage 2 DBPR and LT2ESWTR. There was also an opportunity for public comment at each meeting.

In September 2000, the Committee signed the Agreement in Principle, a full statement of the consensus recommendations of the group. The agreement was published in a December 29, 2000 *Federal Register* notice (65 *FR* 83015) and includes the list of committee members and their organizations. The Committee's recommendations were incorporated into the proposed Stage 2 DBPR.

The M-DBP Committee reached an agreement on the following major issues regarding the Stage 2 DBPR:

- Compliance calculation for TTHMs and HAA5s revised from an RAA to an LRAA.
- Compliance carried out in two phases of the rule (which was revised to a single phase in the final rule.)
- Performance of an IDSE.
- Continued importance of simultaneous compliance with DBP and microbial regulations.
- Unchanged MCL for bromate.

EPA proposed the Stage 2 DBPR on August 18, 2003. After reviewing public comments on the proposed rule, EPA finalized the Stage 2 DBPR on January 4, 2006.

1.1.3 Benefits of the Stage 2 DBPR

1.1.3.1 Quantified health benefits

Although DBPs in drinking water have also been associated with non-cancerous health effects, the quantified benefits that result from the Stage 2 DBPR are associated only with estimated reductions in DBP-related bladder cancer. A complete discussion of risk assessment methodology and assumptions can be found in the Final Stage 2 DBPR Economic Analysis (EA) (USEPA 2005).

Overall, the Stage 2 DBPR may reduce an average of 103 to 541 bladder cancer cases per year. The present value benefits for reductions in bladder cancer that are the result of the Stage 2 DBPR are measured as willingness to pay (WTP) for avoiding lymphoma and bronchitis. The WTP estimates for lymphoma range from $233 million to $3,536 million, annualized over 25 years using a 3 percent discount rate. Using a 7 percent discount rate, the annualized present value benefits range from $190 million to $2,878 million. The WTP estimates for bronchitis range from $165 million to $1,692 million annualized at a 3 percent discount rate, and $135 million to $1,376 million using a 7 percent discount rate.

1.1.3.2 Non-quantified health and non-health related benefits

Although significant benefits will result from the Stage 2 DBPR in terms of the reduction in bladder cancer, the major potential benefits of this rule remain unquantified. Two major unquantified health-related benefits are the potential reduction in adverse reproductive and developmental effects and a reduction in other cancers potentially associated with DBP exposure. Reproductive and developmental endpoints that may be associated with DBP exposure include fetal losses (miscarriage and stillbirth), neural tube defects, heart defects, and cleft palate. Although the science on reproductive and developmental health effects as a result of DBP exposure is not strong enough to include them in the primary Stage 2 DBPR analysis of benefits, the data appear to be sufficient to warrant concern. Both epidemiological and toxicological studies indicate that other cancers may be associated with DBP exposure, but currently there is not enough data to quantify or place a monetary value on these cancer risks.

In addition to unquantified health benefits, there are many non-health benefits of the rule. The Stage 2 DBPR may increase consumer confidence in the quality of drinking water, leading to less averting

behavior (e.g., boiling tap water or purchasing bottled water). Most people who switch to bottled water or use filtration devices do so because of taste and odor problems and health-related issues. Chlorine dioxide and chloramines have historically been used to address taste and odor problems. To the extent that the Stage 2 DBPR changes perceptions of the health risks associated with drinking water and improves taste and odor, it may reduce actions such as buying bottled water or installing filtration devices. Any resulting cost savings would be a regulatory benefit.

As PWSs move from conventional treatment to more advanced technologies, other non-health benefits are anticipated. For example, chlorine dioxide is an alternative disinfectant that is also is effective in controlling the spread of zebra mussels, an invasive species that has caused significant ecological damage in some U.S. waterways. In addition, installation of certain advanced technologies can remove many contaminants in addition to those specifically targeted by the Stage 2 DBPR, including those that EPA may regulate in the future. For example, membrane technology (depending on pore size), can be used to lower DBP formation, but it will also remove many other contaminants that EPA is in the process of regulating. Removal of any contaminants that may face regulation could result in future cost savings to a water system.

1.2 Requirements of the Rule

The following section provides a summary of the rule requirements, preceded by information on new terms defined in the Stage 2 DBPR rule language. The requirements are from the final Stage 2 DBPR published in the *Federal Register* on January 4, 2006. For a copy of the actual rule language, see Appendix B or visit EPA's Web site at www.epa.gov/safewater/disinfection/stage2/index.html.

Compliance schedules

EPA developed the Stage 2 DBPR compliance schedule for monitoring, reporting, and treatment requirements to provide maximum compatibility with the LT2ESWTR compliance schedule. The compliance schedule is divided into the following four schedules based on population served by systems:

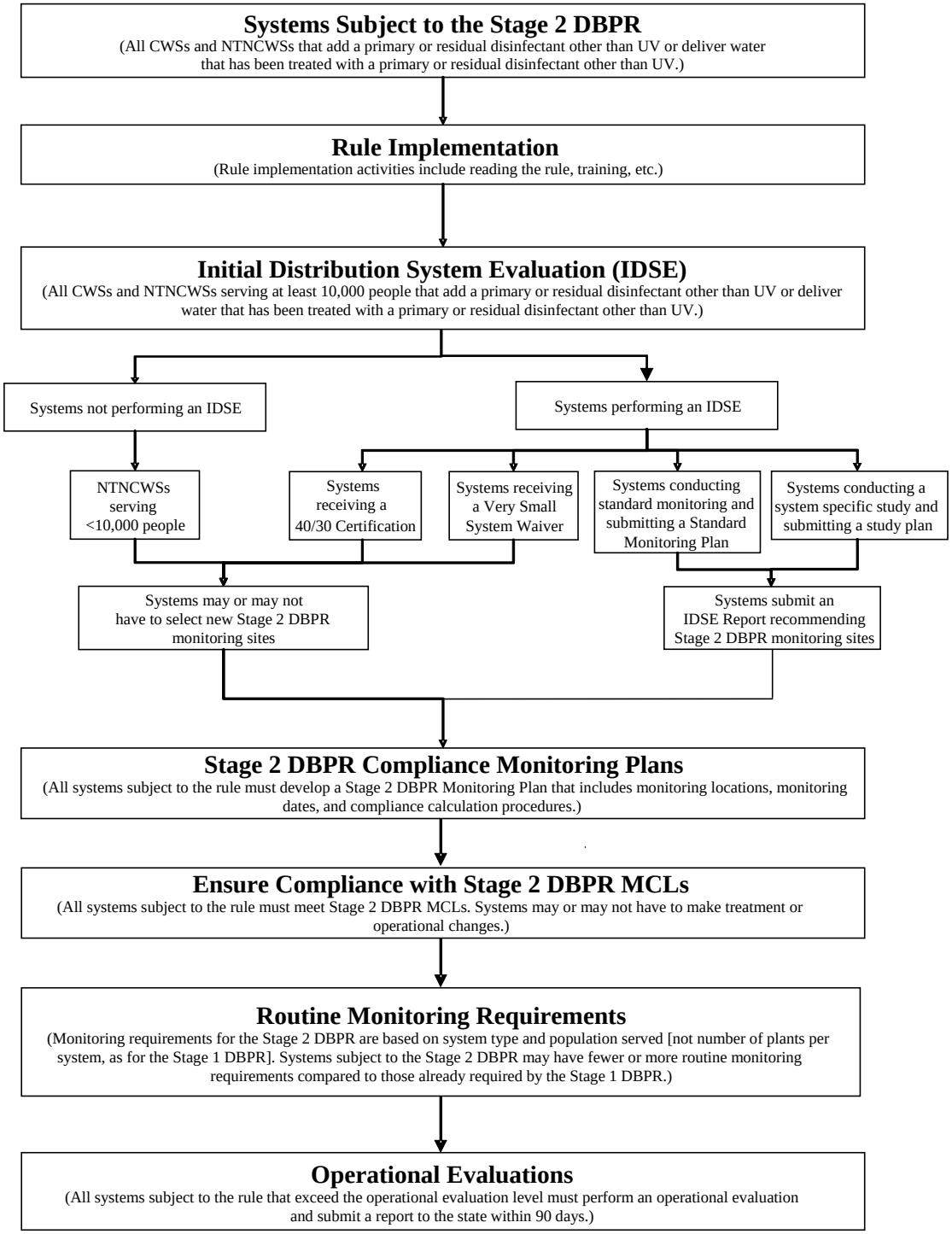
- Schedule 1: Systems serving 100,000 or more people or belonging to a combined distribution system in which the largest system serves 100,000 or more.

- Schedule 2: Systems serving 50,000 to 99,999 people or belonging to a combined distribution system in which the largest system serves 50,000 to 99,999.

- Schedule 3: Systems serving 10,000 to 49,999 people or belonging to a combined distribution system in which the largest system serves 10,000 to 49,999.

- Schedule 4: Systems serving fewer than 10,000 people or belonging to a combined distribution system in which the largest system serves fewer than 10,000.

Figure 1-1. Summary of Stage 2 DBPR Requirements for Systems



1.2.1 New Definitions in the Stage 2 DBPR [40 CFR 141.2]

1.2.1.1 What is a combined distribution system?

The combined distribution system is the interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

1.2.1.2 What is a consecutive system?

A consecutive system is a PWS that receives some or all of its finished water from one or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

1.2.1.3 What is a dual sample set?

A dual sample set is a set of two samples collected at the same time and same location, with one sample analyzed for TTHM and the other sample analyzed for HAA5. Dual sample sets are collected for the purposes of conducting an IDSE and determining compliance with the TTHM and HAA5 MCLs.

1.2.1.4 What is finished water?

Finished water is water that is introduced into the distribution system of a PWS and is intended for distribution and consumption without further treatment, except the level of treatment necessary to maintain water quality (such as booster disinfection or addition of corrosion control chemicals). Within this definition, water entering the distribution system is finished water even if a system subsequently applies additional treatment like booster disinfection to maintain a disinfectant residual throughout the distribution system.

1.2.1.5 What is GAC10?

GAC10 means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days, except that the reactivation frequency for GAC10 used as the best available technology for compliance with Subpart V MCLs under §141.64(b)(2) shall be 120 days.

1.2.1.6 What is GAC20?

GAC20 means granular activation carbon filter beds with an empty-bed contact time of 20 minutes based on average daily flow and a carbon reactivation frequency of every 240 days.

1.2.1.7 What is a locational running annual average?

A locational running annual average (LRAA) is the average of sample analytical results for samples at a particular monitoring location during the previous four calendar quarters.

1.2.1.8 What is a wholesale system?

A wholesale system is a PWS that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another PWS. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

1.2.2 IDSE Requirements [40 CFR 141.600]

The Stage 2 DBPR establishes Initial Distribution System Evaluation (IDSE) requirements. The purpose of the IDSE is to help systems acquire adequate information about their distribution systems and DBP levels to select Stage 2 DBPR compliance monitoring sites that represent high TTHM and HAA5 levels throughout the distribution system. This section identifies which systems are required to meet IDSE requirements, summarizes the different IDSE options, and presents IDSE reporting requirements.

- EPA's *Initial Distribution System Evaluation (IDSE) Guidance Manual* (EPA 815-B-06-002) provides more detailed information on planning and conducting IDSEs.

- The *Initial Distribution System Evaluation Guide for Systems Serving < 10,000 People For The Final Stage 2 Disinfectants and Disinfection Byproducts Rule* (EPA 815-B-06-001) provides guidance on conducting the IDSE, however this manual focuses on information that systems serving < 10,000 are most likely to use. It does not discuss the IDSE system specific study option.

- EPA's IDSE Tool is a Web-based tool that walks the user through the IDSE process. In the program, the Wizard determines IDSE requirements and selects the best IDSE option for your system. The tool creates Custom Forms your system (based on population served and system type) can submit electronically to EPA's Information Processing and Management Center (IPMC) for EPA/state review. (Available on-line at www.epa.gov/safewater/disinfection/tools/index.html).

1.2.2.1 Who is subject to IDSE requirements? [40 CFR 141.600(b)]

Systems subject to IDSE requirements are:

- CWSs that add a primary or residual disinfectant other than UV or deliver water that has been treated with a primary or residual disinfectant other than UV; or

- NTNCWSs serving at least 10,000 people that add a primary or residual disinfectant other than UV or deliver water that has been treated with a primary or residual disinfectant other than UV.

NTNCWSs serving fewer than 10,000 people are not subject to IDSE provisions of the Stage 2 DBPR, but are subject to compliance monitoring provisions.

1.2.2.2 What are the options for the IDSE?

Systems have four ways to satisfy the IDSE requirements:

1. Very Small System Waiver *[40 CFR 141.604]*

   Systems serving fewer than 500 people are eligible for the Very Small System (VSS) Waiver if they collected TTHM and HAA5 samples under the Stage 1 DBPR or have operational TTHM and HAA5 data that meets the general intent of Stage 1 DBPR compliance.

2. 40/30 Certification *[40 CFR 141.603]*

   Systems may fulfill IDSE requirements by demonstrating low historical TTHM and HAA5 distribution system concentrations. Systems are eligible for 40/30 Certification if eight consecutive calendar quarters all individual TTHM results were less than or equal to 0.040 mg/L, and all individual HAA5 results were less than or equal to 0.030 mg/L.

3. System Specific Study (SSS) *[40 CFR 141.602]*

   Systems may complete an SSS, based either on existing monitoring data or on distribution system modeling. Examples of acceptable studies include a hydraulic modeling study that simulates water movement in the distribution system or a study of recent TTHM and HAA5 monitoring data that encompass a wide range of sample sites, including those with representative high TTHM and HAA5 concentrations.

4. Standard Monitoring *[40 CFR 141.601]*

   Systems may complete 1 year of distribution system monitoring on a set schedule that includes the peak historical month for TTHM or HAA5 levels or warmest water temperature. The frequency of monitoring and the number and location of monitoring sites follows a standard monitoring scheme dependent on population served and source water. All IDSE samples must be taken as dual sample sets.

1.2.2.3 What is the time frame for compliance with the IDSE?

Table 1-1 outlines the deadlines for submittal for compliance with the IDSE based on the system's schedule.

Table 1-1. IDSE Plan and Report Dues Dates [40 CFR 141.600(c)]

Requirement	Compliance dates by PWS size (retail populations served)[1]				
	CWSs and NTNCWSs serving at least 100,000	**CWSs and NTNCWSs serving 50,000-99,999**	**CWSs and NTNCWSs serving 10,000-49,999**	**CWSs serving <10,000**	**NTNCWSs serving <10,000**
Submit Standard Monitoring Plan or submit SSS Plan OR submit 40/30 Certification OR receive VSS Waiver from state	October 1, 2006	April 1, 2007	October 1, 2007	April 1, 2008	Not applicable
Complete standard monitoring or SSS	September 30, 2008	March 31, 2009	September 30, 2009	March 31, 2010	Not applicable
Submit IDSE Report	January 1, 2009	July 1, 2009	January 1, 2010	July 1, 201	Not applicable

1. Wholesale and consecutive systems that are part of a combined distribution system must comply based on the schedule required of the largest system in the combined distribution system.

1.2.2.4 What are the requirements for systems that receive a VSS Waiver or 40/30 Certification for the IDSE?

Systems that qualify for and receive the VSS Waiver or 40/30 Certification do not have to conduct an IDSE, these systems will need to prepare a Stage 2 DBPR Compliance Monitoring Plan and meet compliance monitoring requirements, as discussed in section 3.6.2.

Very Small System Waiver [40 CFR 141.604]

Systems serving fewer than 500 people may be eligible for the VSS Waiver if they have collected TTHM and HAA5 samples under the Stage 1 DBPR or have operational TTHM and HAA5 data that meets the general intent of Stage 1 DBPR compliance. VSS Waivers are effective immediately for systems that meet the eligibility requirements and no application from the water system is necessary. Regardless of a system's eligibility, a state can still require a small system to conduct standard monitoring or an SSS according to the schedule in Table 1-1.

40/30 Certification [40 CFR 141.603]

Another alternative systems have for fulfilling the IDSE requirements is to demonstrate low historical TTHM and HAA5 distribution system concentrations. Systems are eligible for 40/30 Certification if their data meet the following criteria: eight consecutive calendar quarters, with all individual TTHM results less than or equal to 0.040 mg/L, and all individual HAA5 results less than or equal to 0.030 mg/L.

- The eight consecutive calendar quarters must have begun no earlier than the date specified in Table 1-2.

- TTHM and HAA5 samples must have been analyzed by a laboratory certified under the drinking water certification program to perform these measurements and using approved methods.

- The system must have had no TTHM or HAA5 monitoring violations during the same eight consecutive calendar quarters.

Table 1-2. 40/30 Certification Eligibility Dates

If your 40/30 Certification is due	Then your eligibility for 40/30 Certification is based on eight consecutive calendar quarters of Subpart L compliance monitoring results beginning no earlier than [1]
(1) October 1, 2006	January 2004
(2) April 1, 2007	January 2004
(3) October 1, 2007	January 2005
(4) April 1, 2008	January 2005

1. Unless you are on reduced monitoring under Subpart L of this part and were not required to monitor during the specific period. If you did not monitor during the specified period, you must based your eligibility on compliance samples taken during the 12 months preceding the specific period.

Some states may allow systems that were not required to comply with Stage 1 DBPR to use operational data to support a 40/30 Certification. The samples must meet the general intent of Stage 1 DBPR compliance, which would include:

- Samples were analyzed by approved methods at a certified lab.
- Number of sites was adequate to represent the distribution system and correlate to the number required under the Stage 1 DBPR.
- Sample sites were located at sites with average and maximum residence time.
- Samples were taken during the month of warmest water temperature.
- Samples were taken on a monthly, quarterly or annual basis, depending on population, disinfectant type, source type.

A system selecting this option must certify its eligibility to the state according to the schedule shown in Table 1-1. The state may require the system to submit the following additional information:

- Compliance monitoring results.
- Distribution system schematics.
- Recommended Stage 2 DBPR compliance monitoring locations.

At the state's discretion, a system meeting all of the requirements for 40/30 Certification may still be required to conducted standard monitoring or an SSS.

1.2.2.5 What are the requirements for systems that must conduct a standard monitoring or an SSS IDSE?

Systems that are required to conduct a standard monitoring or an SSS IDSE to comply with the provisions of the rule must prepare and submit an IDSE plan, conduct the IDSE, and prepare and submit a final IDSE Report.

System Specific Study [40 CFR 141.602]

To comply with the IDSE requirement, systems may choose to perform an SSS, based either on existing monitoring data or on extended period hydraulic modeling. Examples of acceptable studies include an extended period hydraulic modeling study that simulates water movement in the distribution system or recent TTHM and HAA5 monitoring data that encompass a wide range of sample sites, including those with representative high TTHM and HAA5 concentrations.

Systems selecting this option must submit a study plan before the SSS, and an IDSE Report after the SSS, according to the schedule shown in Table 1-1. A system that conducts its SSS early may satisfy both requirements by submitting an IDSE Report in place of the study plan, as long as the IDSE Report also includes all information required in the study plan.

Standard Monitoring [40 CFR 141.601]

To comply with the IDSE requirement, systems may choose to conduct standard monitoring at a frequency and at the sites defined in the rule. Systems selecting this option must submit a Standard Monitoring Plan, then conduct monitoring in accordance with the plan as approved by EPA, and must submit an IDSE Report, according to the schedule shown in Table 1-1.

1.2.2.6 What must an SSS include? [40 CFR 141.602(a)]

An SSS must be based on either existing DBP monitoring results or an extended period simulation hydraulic model. The information to be included in the study plan depends on whether the system opts to use the existing monitoring results or the modeling approach for the IDSE.

System Specific Study - Existing Monitoring Plan

An SSS based on existing monitoring results must include Stage 1 DBPR TTHM and HAA5 results collected no more than 5 years before the submission of the plan. Monitoring results must include all Stage 1 DBPR compliance monitoring and additional monitoring results as necessary to meet minimum sampling requirements (Table 1-3). Each location must have been sampled once during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature for every 12 months of data submitted for that location.

Table 1-3. SSS Monitoring Locations and Frequency [40 CFR 141.602(b)]

System Type	Population Size Category	Number of Monitoring Locations	Number of Samples	
			TTHM	HAA5
Subpart H	<500	3	3	3
	500-3,300	3	9	9

System Type	Population Size Category	Number of Monitoring Locations	Number of Samples	
			TTHM	HAA5
	3,301-9,999	6	36	36
	10,000-49,999	12	72	72
	50,000-249,999	24	144	144
	250,000-999,999	36	216	216
	1,000,000-4,999,999	48	288	288
	≥ 5,000,000	60	360	360
Ground Water	<500	3	3	3
	500-9,999	3	9	9
	10,000-99,999	12	48	48
	100,000-499,999	18	72	72
	≥ 500,000	24	96	96

The system must certify that:

- The reported monitoring results include all compliance and non-compliance results generated during the time period beginning with the first reported result and ending with the most recent Stage 1 DBPR results,

- The samples were representative of the entire distribution system; and

- The distribution system and treatment regimen have not changed significantly since the samples were collected.

The monitoring plan must also include:

- A schematic of the distribution system including:
  - Distribution system entry points and their sources.
  - Storage facilities.
  - Notes indicating the locations and dates of all completed or planned SSS monitoring.
- The system type (Subpart H [surface water or GWUDI] or ground water); and
- The population served.

If the state rejects some of the data from a study plan, the system must either conduct additional monitoring to replace rejected data on a schedule the state approves, or conduct standard monitoring.

System Specific Study – Hydraulic Modeling Plan

An SSS based on modeling must be based on an extended period simulation hydraulic model. The model must simulate 24-hour variation in demand and show a consistently repeating 24-hour pattern of residence time. In addition, the model must be calibrated, or have calibration plans, for the current configuration of the distribution system during the period of high TTHM formation potential. The calibration must be

completed no later than 12 months after a system submits its plan. The model must represent the following criteria:

- Seventy-five percent of pipe volume.
- Fifty percent of pipe length.
- All pressure zones.
- All 12-inch diameter and larger pipes.
- All 8-inch and larger pipes that connect pressure zones, influence zones from different sources, storage facilities, major demand areas, pumps, and control valves, or are known or expected to be significant conveyors of water.
- All 6-inch and larger pipes that connect remote areas of a distribution system to the main portion of the system.
- All storage facilities with standard operations represented in the model.
- All active pump station with controls represented in the model.
- All active control valves.

The model should also include the following information:

- Description of all model calibration activities undertaken, and, if calibration is complete,
  - A graph of predicted tank levels versus measured tank levels for the storage facility with the highest residence time in each pressure zone, and
  - A time series graph of the residence time at the longest residence time storage facility in the distribution system showing the predictions for the entire simulation period (i.e., from time zero until the time it takes for the model to reach a consistently repeating pattern of residence time).
- Model output showing preliminary 24 hour average residence time predictions throughout the distribution system
- The timing and number of samples representative of the distribution system planned for at least one monitoring period of TTHM and HAA5 dual sample monitoring at a number of locations no fewer than would be required for the system under standard monitoring during the historical month high TTHM (at locations other than existing Stage 1 DBPR compliance monitoring locations).
- Description of how the system will complete all the requirements, no later than 12 months after the plan is submitted.

- A schematic of the distribution system with notes indicating the locations and dates of:
  - All completed study monitoring (if calibration is complete), and
  - All Stage 1 DBPR compliance monitoring.
- A table or spreadsheet with data demonstrating that the model meets the rule requirements.
- The plan should specify the system type (Subpart H or ground water) and the population served.

If a modeling study plan does not fully meet the requirements, the system will be required to correct the deficiencies and provide further information. If a system's SSS is not approved, the system will need to perform standard monitoring to comply with the IDSE.

1.2.2.7 What must a Standard Monitoring Plan include? [40 CFR 141.601(a)]

The monitoring plan must include:

- Schematic of the system's distribution system (including distribution system entry points and their sources, and storage facilities).
- Notes indicating locations and dates of all projected standard monitoring, and all projected Stage 1 DBPR compliance monitoring.
- Justification for standard monitoring location selection.
- Summary of data upon with the justification is based.
- System type (Subpart H or ground water) and population served.

1.2.2.8 How long must the Standard Monitoring Plan or SSS Plan be retained?

Systems must retain a copy of their Standard Monitoring Plan or SSS Plan, including any state modification to the plan, for a period of 10 years from the date the system submitted the plan to the state.

1.2.2.9 Who must submit an IDSE Report?

Systems performing standard monitoring or an SSS must submit an IDSE Report to the state for approval according to the schedule shown in Table 1-1.

1.2.2.10 What must the IDSE Report include?

For systems conducting standard monitoring, the IDSE Report must include [§141.601(c)]:

- All TTHM and HAA5 analytical results from Stage 1 DBPR compliance monitoring and all standard monitoring completed during the period of the IDSE as individual analytical results and LRAAs, presented in a tabular or spreadsheet format acceptable to the state.
- If they changed since the Standard Monitoring Plan was submitted, a schematic of the distribution system, system type, and population served.

- Explanation of any deviations from the approved Standard Monitoring Plan.

- Recommendations and justifications for Stage 2 DBPR compliance monitoring locations and timing.

For systems conducting the SSS, the IDSE Report must include [§141.602(b)]:

- All TTHM and HAA5 analytical results from Stage 1 DBPR compliance monitoring and all system specific study monitoring completed during the period of the study, presented in a tabular or spreadsheet format acceptable to the state.

- If they changed since the system specific study monitoring plan was submitted, a schematic of the distribution system, system type, and population served.

- If the study was a modeling study, an update of all the information in the study plan and a 24-hour time series graph of residence time for each Stage 2 DBPR compliance monitoring location selected.

- Recommendations and justifications for Stage 2 DBPR compliance monitoring locations and timing.

- Explanation of any deviations from the approved SSS Plan.

1.2.2.11 How long must the IDSE Report be retained?

Systems must retain their IDSE Report for 10 years after the date they submit it. If the state modifies the Stage 2 DBPR monitoring requirements in an IDSE Report or approves alternative monitoring locations, the system must keep a copy of the state's notification on file for 10 years after the date of notification. The IDSE Report and any state notification must be available for review by the state or the public.

1.2.3 Stage 2 DBPR Compliance Monitoring [40 CFR 141.620, 40 CFR 141.621]

This section summarizes the requirements for Stage 2 DBPR compliance monitoring, required contents of the Stage 2 DBPR Compliance Monitoring Plan, reduced monitoring, increased monitoring, and special issues for consecutive systems. **As with the IDSE monitoring, Stage 2 DBPR compliance monitoring requirements vary according to source type and population served.**

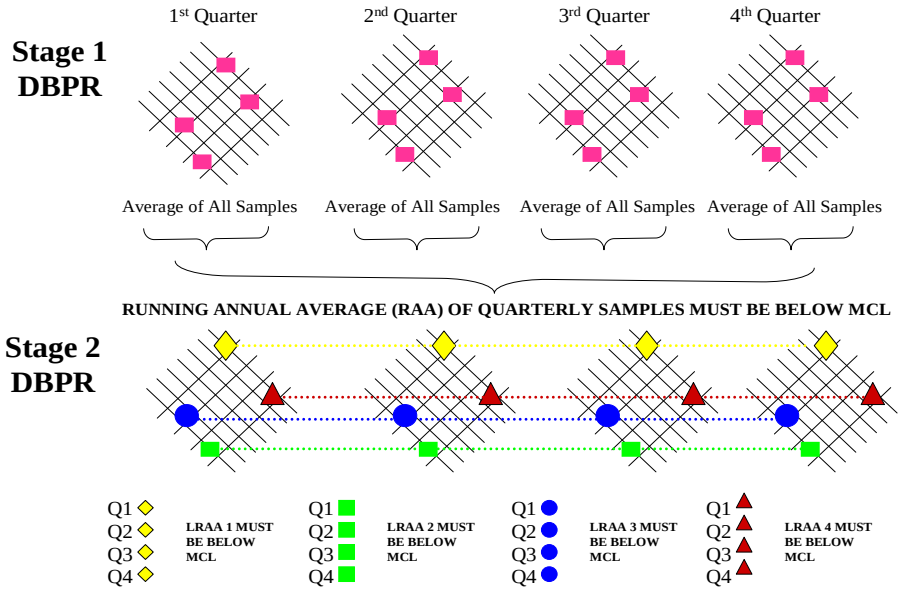
Stage 2 DBPR compliance monitoring applies to all CWSs and NTNCWSs that add a primary or residual disinfectant other than UV or deliver water that has been treated with a primary or residual disinfectant other than UV.

1.2.3.1 How is compliance calculated for TTHM and HAA5 under Stage 2 DBPR? [40 CFR 141.620(d)]

The Stage 2 DBPR changes the way compliance is determined with MCLs by changing the way sampling results are averaged. Stage 2 DBPR determines compliance with the MCL on an LRAA instead of the system-wide RAA as is used under the Stage 1 DBPR. The primary objective of the LRAA is to reduce exposure to high DBP levels. For an LRAA, an annual average is calculated at each monitoring site. The RAA compliance calculation allows a system-wide annual average. In this situation, high DBP concentrations in one or more locations are averaged with lower concentrations elsewhere in the

distribution system. Figure 1-2 illustrates the difference in calculating compliance with the MCLs for TTHM between a Stage 1 DBPR RAA and the Stage 2 DBPR LRAA.

Figure 1-2. Comparison of RAA and LRAA Compliance Calculations[1]



1. Stage 2 DBPR sampling locations will (in most cases) be selected based on the results of an IDSE and may be different from Stage 1 DBPR sampling sites.

The new Stage 2 DBPR TTHM and HAA5 LRAA requirements apply to all CWSs and NTNCWSs that serve chemically disinfected (i.e., add a primary or residual disinfectant other than UV or deliver water that has been treated with a primary or residual disinfectant other than UV) drinking water, regardless of whether they treat the water themselves or receive it from another system.

Note that LRAAs are used for compliance with TTHM and HAA5 MCLs. The bromate MCL of 0.010 mg/L, for example, is still measured as an RAA as required by the Stage 1 DBPR.

1.2.3.2 What are the Stage 2 DBPR MCLs? [40 CFR 141.620]

For the Stage 2 DBPR, CWSs and NTNCWSs must comply with MCLs of 0.080 mg/L and 0.060 mg/L as LRAAs for TTHM and HAA5, respectively, based on monitoring at locations identified in their monitoring plans (see sections 1.2.3.4-1.2.3.7 for a discussion of Stage 2 DBPR Compliance Monitoring Plans and routine monitoring requirements).

1.2.3.3 What are the new MCLGs? [40 CFR 141.53]

The Stage 2 DBPR establishes MCLGs for a number of DBPs. These new MCLGs do not affect the MCLs for TTHM or HAA5. Table 1-4 summarizes the new MCLGs.

Table 1-4. Summary of Stage 2 DBPR MCLGs

Contaminant	MCLG (mg/L)
Bromodichloromethane	zero
Bromoform	zero
Bromate	zero
Chlorite	0.8
Chloroform	0.07
Dibromochloromethane	0.06
Dichloroacetic acid	zero
Monochloroacetic acid	0.07
Trichloroacetic acid	0.02

1.2.3.4 What Are the Requirements for Developing a Stage 2 DBPR Compliance Monitoring Plan? [40 CFR 141.622]

All systems required to conduct compliance monitoring under the Stage 2 DBPR must develop a Compliance Monitoring Plan. However, systems that completed an IDSE Report will have included their monitoring locations and dates in the report. For most systems, if they also include compliance calculation procedures, they may be able to meet the requirements of the Compliance Monitoring Plan and will not have to submit a separate document.

For systems that are required to complete a Compliance Monitoring Plan, they must complete the plan no later than the date when monitoring begins (see table 1-5) and must contain the following information:

- Monitoring locations;
- Monitoring dates;
- Compliance calculation procedures; and
- Monitoring plans for other systems in the combined distribution system if the state has reduced monitoring requirements [§142.16(m)].

Systems that completed an IDSE but did not include the compliance calculation procedures in their IDSE Report must still prepare a Compliance Monitoring Plan. These systems should base their Compliance Monitoring Plan on the IDSE Report and any state modifications. Systems may revise their Compliance Monitoring Plan to reflect changes in treatment, distribution system operations and layout, or other factors that may affect TTHM or HAA5 formation. If there are any changes to the monitoring locations, systems must replace existing compliance monitoring locations with expected high TTHM or HAA5 levels. Systems with a VSS Waiver must comply by updating their Stage 1 DBPR monitoring plan, which was developed under §141.132(f).

Systems that qualified for the 40/30 Certification and NTNCWSs that did not conduct standard monitoring or an SSS should use their Stage 1 DBPR monitoring sites as the basis for Stage 2 DBPR site

selection. If a system has more Stage 1 DBPR sites than required under for Stage 2 DBPR compliance monitoring, it must select Stage 2 DBPR compliance monitoring sites by alternating selection of locations representing high TTHM and high HAA5 levels until the required number of Stage 2 DBPR compliance monitoring locations have been identified. If a system has fewer Stage 1 DBPR sites than required by the Stage 2 DBPR, the system must select the sites with highest DBP levels, alternating selection of locations representing high TTHM levels and high HAA5 levels, starting with high TTHM.

1.2.3.5 What are the reporting and recordkeeping requirements for Stage 2 DBPR Compliance Monitoring Plan? [40 CFR 141.622(c), 40 CFR 141.629(b)]

All systems must keep their Stage 2 DBPR Compliance Monitoring Plan on file for state and public review. Subpart H systems serving more than 3,300 people are required to submit copies of their Compliance Monitoring Plans to the state before they begin compliance monitoring, unless their IDSE Report already contains the required information. The state may modify a system's Compliance Monitoring Plan.

1.2.3.6 What Are the Compliance Deadlines for Stage 2 DBPR Compliance Monitoring? [40 CFR 141.620(c)]

Table 1-5 summarizes the deadlines for Stage 2 DBPR for TTHM and HAA5 compliance monitoring. If a system is required to conduct quarterly monitoring, it must begin monitoring in the first full calendar quarter that includes the compliance date in Table 1-5. If the system is required to conduct monitoring at a frequency that is less than quarterly, it must begin monitoring in the calendar month recommended in the IDSE Report, or in the calendar month identified in the monitoring plan, no later than 12 months after the compliance date in Table 1-5.

Table 1-5. Compliance Schedule for Stage 2 DBPR TTHM and HAA5 Monitoring

Requirement	Compliance dates by PWS size (retail populations served)[1]				
	CWSs and NTNCWSs serving at least 100,000	**CWSs and NTNCWSs serving 50,000-99,999**	**CWSs and NTNCWSs serving 10,000-49,999**	**CWSs serving <10,000**	**NTNCWSs serving <10,000**
Begin Stage 2 Compliance (Subpart V) Monitoring[2]	April 1, 2012	October 1, 2012	October 1, 2013	October 1, 2013 (October 1, 2014 if *Crypto-sporidium* monitoring is required under LT2ESWTR.)	October 1, 2013 (October 1, 2014 if *Crypto-sporidium* monitoring is required under LT2ESWTR.)

1. Wholesale and consecutive systems that are part of a combined distribution system must comply based on the schedule required of the largest system in the combined distribution system.

2. States may grant up to an additional 2 years for systems making capital improvements. See Appendix I for guidance on reviewing extension requests under Section 1412(b)(10) of the SDWA.

1.2.3.7 What Are the Requirements for Routine Monitoring? [40 CFR 141.621]

Table 1-6 shows the Stage 2 DBPR routine compliance monitoring requirements. For systems (including consecutive systems), monitoring requirements are based on source type and population served (instead of

the number of plants, as was the case under the Stage 1 DBPR.) The number of sampling sites may also increase or decrease from Stage 1 DBPR to Stage 2 DBPR.

Depending on monitoring results, a system may be eligible for reduced monitoring under §141.623 (Section 3.15). Some systems may be required to conduct increased monitoring if certain conditions are met as specified in §141.625 (Section 3.16).

Table 1-6. Stage 2 DBPR Routine Compliance Monitoring Requirements

Source Water Type	Population Size Category	Monitoring Frequency [1]	Distribution System Monitoring Location Total per Monitoring Period [2]
Subpart H	<500	per year	2
	500-3,300	per quarter	2
	3,301-9,999	per quarter	2
	10,000-49,999	per quarter	4
	50,000-249,999	per quarter	8
	250,000-999,999	per quarter	12
	1,000,000-4,999,999	per quarter	16
	≥ 5,000,000	per quarter	20
Ground Water	<500	per year	2
	500-9,999	per year	2
	10,000-99,999	per quarter	4
	100,000-499,999	per quarter	6
	≥ 500,000	per quarter	8

1. All systems must take at least one dual sample set during the month of highest DBP concentrations.
2. Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for Subpart H systems serving 500-3,300. Systems on annual monitoring and Subpart H systems serving 500-3,300 are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location (and month, if monitored annually).

1.2.3.8 How Do Systems Qualify for Reduced Stage 2 DBPR Monitoring? [40 CFR 141.623]

Systems may qualify for reduced monitoring if their LRAAs at all monitoring locations for TTHM and HAA5 are no more than 0.040 mg/L and 0.030 mg/L, respectively. In addition, Subpart H systems must maintain annual average TOC levels of 4.0 mg/L or less in source water at each treatment plant in order to qualify. Systems should note that under the Stage 1 DBPR, no sampling frequency for TOC was specified. Beginning April 1, 2008 (or earlier if specified by the state), systems must sample for TOC every 30 days to qualify for reduced monitoring and sample every 90 days to remain on reduced monitoring. Therefore, systems on a reduced Stage 1 DBPR monitoring schedule may need to conduct Stage 2 DBPR compliance monitoring on a routine monitoring schedule until they have collected sufficient TOC data to qualify for reduced monitoring.

Systems may remain on reduced monitoring as long as their quarterly LRAAs for TTHMs and HAA5 remain no more than 0.040 mg/L and 0.030 mg/L, respectively (for systems with quarterly reduced monitoring) or their TTHM and HAA5 samples are no higher than 0.060 mg/L and 0.045 mg/L, respectively (for systems with annual or less frequent monitoring). In addition, Subpart H systems must continue to maintain annual average TOC levels of 4.0 mg/L or less in source water at each treatment plant.

If monitoring results indicate that a system is no longer eligible for reduced monitoring, the system must resume routine monitoring or begin increased monitoring the quarter immediately following the monitoring period in which the system exceeded the specified levels for reduced monitoring. The state may also use its discretion to return a system to routine monitoring.

Table 1-7. Stage 2 DBPR Reduced Monitoring Requirements for All Systems

Source Water Type	Population Size Category	Monitoring Frequency [1]	Distribution System Monitoring Location per Monitoring Period
Subpart H	<500	-	Monitoring may not be reduced.
	500-3,300	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	3,301-9,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
	10,000-49,999	per quarter	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs.
	50,000-249,999	per quarter	4 dual sample sets - at the locations with the two highest TTHM and two highest HAA5 LRAAs.
	250,000-999,999	per quarter	6 dual sample sets - at the locations with the three highest TTHM and three highest HAA5 LRAAs.
	1,000,000-4,999,999	per quarter	8 dual sample sets - at the locations with the four highest TTHM and four highest HAA5 LRAAs.
	≥ 5,000,000	per quarter	10 dual sample sets - at the locations with the five highest TTHM and five highest HAA5 LRAAs.
Ground Water	<500	every third year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	500-9,999	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	10,000-99,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.

Source Water Type	Population Size Category	Monitoring Frequency [1]	Distribution System Monitoring Location per Monitoring Period
	100,000-499,999	per quarter	2 dual sample sets; at the locations with the highest TTHM and highest HAA5 LRAAs.
	≥ 500,000	per quarter	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.

1. Systems on quarterly monitoring must take dual sample sets every 90 days.

1.2.3.9 What Are the Requirements for Increased Monitoring? [40 CFR 141.625, 40 CFR 141.628]

If a system monitors annually or less frequently than annually on either the routine monitoring schedule or the reduced monitoring schedule and a TTHM sample exceeds 0.080 mg/L or a HAA5 sample exceeds 0.060 mg/L at any location, the system must increase monitoring frequency to dual sample sets once per quarter (taken every 90 days) at all locations.

A system may return to routine monitoring if the TTHM LRAA for every monitoring location is less than or equal to 0.060 mg/L and the HAA5 LRAA for every monitoring location is less than or equal to 0.045 mg/L after conducting at least four consecutive quarters of increased monitoring.

Systems on an increased Stage 1 DBPR monitoring schedule must begin Stage 2 DBPR monitoring on the increased schedule until they meet the requirements above for returning to the routine schedule.

1.2.4 Monitoring Requirements for Consecutive Systems

1.2.4.1 What are the DBP monitoring requirements for consecutive systems? [40 CFR 141.620]

The TTHM and HAA5 sampling requirements for consecutive systems are determined in the same manner as for all other systems. The number of sites and monitoring frequency is based on the system's population served and source type (based on wholesale system's source water type). Thus, large consecutive systems will take more samples than a smaller wholesale system.

States may modify the Stage 2 DBPR compliance monitoring requirements for consecutive systems by treating a combined distribution system as a single system. This is allowed to the extent that the interconnection of the systems justifies such modifications [§141.29]. If the state elects to use this authority, they must describe in their primacy application how they will implement this procedure and include a requirement that at least one monitoring site will be located in each water system [§142.16(m)].

1.2.4.2 What are the Chlorine and Chloramines requirements for consecutive systems? [40 CFR 141.624]

Consecutive systems that do not add a disinfectant but deliver water that was treated with a disinfectant other than UV must now comply with the Stage 1 DBPR analytical and monitoring requirements for chlorine and chloramines and associated compliance requirements and reporting requirements. These requirements include:

- Analytical methods [§141.131(c)],
- Monitoring of residual at the same sites as total coliform sampling [§141.132(c)(1)],

- Compliance with the MRDL [§141.133(c)(1)], and
- Reporting of results [§141.134(c)].

These requirements begin April 1, 2009 unless required earlier by the state.

Additional Resources for Consecutive Systems

EPA is preparing a guidance manual for consecutive systems to address these and other issues.

1.2.5 Operational Evaluation Levels [40 CFR 141.626]

TTHM and HAA5 MCL compliance is based on an LRAA, therefore a system may have individual DBP results significantly higher than the MCL from time to time while remaining in compliance. This situation is a result of the fact that high concentrations are averaged with lower concentrations at a given location. While this situation does not constitute an MCL violation, it might indicate a trend that could lead to an MCL violation in future quarters.

The "operational evaluation level" is an LRAA threshold, meant to help systems identify if they are in danger of exceeding the MCL in the following monitoring quarter. The process is useful in that it alerts the system to the potential of an MCL violation if DBP levels remain at their current level and encourages them to consider what operational changes may be necessary to reduce DBP levels.

The operational evaluation level at any location is the sum of the two previous quarters' TTHM or HAA5 results plus twice the current quarter's TTHM or HAA5 result, divided by four to determine an average. Effectively, it is the LRAA that can be expected if the next quarter's result is the same as the current quarter's result. To determine if a system has exceeded operational evaluation levels at any sampling location, the following formula is used:

If $(Q_1 + Q_2 + 2Q_3)/4 >$ MCL at any monitoring location,

where
Q_3 = current quarter measurement
Q_2 = previous quarter measurement
Q_1 =quarter before previous quarter measurement
MCL=Stage 2 DBPR MCL for TTHM (0.080 mg/l) **<u>or</u>** Stage 2 DBPR MCL for HAA5 (0.060 mg/L)

then the system must conduct an operational evaluation.

If the operational evaluation level for TTHM exceeds 0.080 mg/L or the operational evaluation level for HAA5 exceeds 0.060 mg/L at any monitoring location, an exceedance of the operational evaluation level has occurred.

If this happens, the system must conduct an operational evaluation and submit a written report of the evaluation to the state no later than 90 days after the system is notified of the analytical result that caused the exceedance. The written report must be available to the public upon request. The operational evaluation must include an examination of system treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation, and what steps could be considered to minimize future exceedances.

If the system is readily able to identify the cause of the exceedance, it may request permission to limit the scope of the evaluation. If the state grants the request, the system must still follow the schedule for completing the evaluation. The state must approve the limited scope in writing, and the system must keep the approval with the completed report.

For more information on operational evaluations, refer to EPA's *Operational Evaluation Guidance Manual* (formerly titled the *Significant Excursions Guidance Manual*) available online at www.epa.gov/safewater/disinfection/stage2/compliance.html#pws.

1.2.6 Bromate Requirements [40 CFR 141.132]

The MCL for bromate for systems using ozone remains 0.010 mg/L (measured as an RAA) for samples taken at the entrance to the distribution system as established by the Stage 1 DBPR. However, the criterion for a system using ozone to qualify for reduced bromate monitoring has changed from demonstrating low levels of bromide in the source water to demonstrating low levels of bromate in the finished water, now that more sensitive bromate methods are available. Beginning April 1, 2009, systems must have a bromate RAA of 0.0025 mg/L or less based on 1 year of monthly data to qualify for reduced bromate monitoring. In addition, the samples must be analyzed using Method 317.0 Revision 2.0, 326.0, or 321.8. Systems must continue to compute the RAA quarterly after qualifying for reduced bromate monitoring, and if the RAA exceeds 0.0025 mg/L, the system must return to routine monitoring.

1.2.7 Reporting/Recordkeeping Requirements [40 CFR 141.33, 40 CFR 141.629]

Note that the state may choose to perform calculations and determine whether the system exceeded the MCL or the system is eligible for reduced monitoring in lieu of having the system report that information.

1.2.7.1 What monitoring information must be reported? [40 CFR 141.629(a)(2)]

Systems must report the following information for each monitoring location to the state within 10 days of the end of any quarter in which monitoring is required:

- Number of samples taken during the last quarter.
- Date and results of each sample taken during the last quarter.
- If monitoring is quarterly, the LRAAs of quarterly TTHM and HAA5 results for the last four quarters. If an LRAA calculation based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, this information too must be submitted to the state.
- Whether an MCL was violated.
- Any operational evaluation levels that were exceeded, including location, date, and the calculated TTHM and HAA5 levels.

1.2.7.2 What information for Source Water TOC for must Subpart H systems report? [40 CFR 141.629(a)(2)]

Subpart H systems seeking to qualify for or remain on reduced TTHM/HAA5 monitoring must also report the following source water TOC information for each treatment plant that treats surface water or GWUDI to the state within 10 days of the end of any quarter in which monitoring is required:

- The number of source water TOC samples taken each month during the last quarter.
- The date and result of each sample taken during the last quarter.
- The quarterly average of monthly samples taken during the last quarter or the result of the quarterly sample.
- The RAA of quarterly averages from the past four quarters.
- Whether the RAA exceeded 4.0 mg/L.

1.2.7.3 What are the recordkeeping requirements for IDSE Plans, IDSE Reports, and Monitoring Results? [40 CFR 141.629(b)]

Systems must retain a copy of their Standard Monitoring Plan or SSS Plan, including any state modification to the plan, for a period of 10 years from the date it was submitted. They must also retain their IDSE Report for 10 years after the date they submit it. If the state modifies the Stage 2 DBPR monitoring requirements in an IDSE Report or approves alternative monitoring locations, the system must keep a copy of the state's notification on file for 10 years after the date of notification. The IDSE Report and any state notification must be available for review by the state or the public.

Systems must keep copies of Stage 2 DBPR Compliance Monitoring Plans and monitoring results for at least 10 years.

1.2.7.4 What are the reporting and recordkeeping requirements for consecutive systems? [40 CFR 141.134(c), 40 CFR 141.622(c), 40 CFR 141.629(b)]

Consecutive systems are subject to the same reporting and recordkeeping requirements as other systems affected by the Stage 2 DBPR. In addition, they are required to conduct appropriate public notification after a violation. In their CCR, consecutive systems must include results of testing conducted by the wholesale system unless the consecutive system conducted equivalent testing that indicates it was in compliance. In this case, the consecutive system reports its own compliance monitoring results. EPA is preparing a guidance manual for consecutive systems to address these and other issues.

1.2.8 Public Notification of Drinking Water Violations [40 CFR 141 Subpart Q, Appendix A]

In addition to the violations identified under the Stage 1 DBPR, the Stage 2 DBPR added violations requiring either a Tier 2 or Tier 3 notification. Tier 2 public notification is required for violations of TTHM or HAA5 LRAA MCLs. Tier 3 public notification of monitoring violations is required for failure to:

- Monitor for TTHM or HAA5 in accordance with the schedule in the monitoring plan.
- Return from reduced to routine monthly bromate monitoring if the RAA of bromate exceeds 0.0025 mg/L or if samples were not analyzed using an acceptable method beginning April 1, 2009.
- Qualify for a VSS Waiver, submit a 40/30 Certification, conduct standard monitoring or an SSS IDSE by the compliance deadline. The same is true for the IDSE Report for systems that conducted standard monitoring or an SSS IDSE.

A description of the Stage 1 DBPR violations is in section 2 of EPA's *Implementation Guidance for the Stage 1 Disinfectants/Disinfection Byproducts Rule* (EPA 816-R-01-012).

1.2.9 CCR Requirements [40 CFR 141.151, 40 CFR 141.153]

The CCR Rule requires systems to report in their annual consumer confidence reports any regulated contaminants that are detected. Since detection is not defined for DBP contaminants, the Stage 2 DBPR specifies reporting levels for the regulated DBPs. EPA has incorporated minimum reporting level (MRL) requirements into the laboratory certification program for DBPs and required systems to use regulatory MRLs as the minimum concentrations that must be reported as part of the CCRs [§141.151(d)].

When compliance with the MCL is determined by calculating an LRAA, systems must include the highest LRAA for TTHM and HAA5 and the range of individual sample results for all sampling points expressed in the same units as the MCL. If more than one site exceeds the MCL, the system must include the LRAA for all sites that exceed the MCL.

If the system conducts an IDSE, it is required to include individual sample results collected for the IDSE when determining the range of TTHM and HAA5 results to be reported in the CCR for the calendar years that the IDSE samples were taken.

Responsibility for the CCR rests with the individual system. Under the CCR Rule, the wholesale system is responsible for notifying the consecutive system of analytical results and violations related to monitoring conducted by the wholesale system. Consecutive systems must include analytical results of the wholesale system in their CCR, unless the consecutive system conducted equivalent testing demonstrating that it was in compliance. In the latter case, the consecutive system must report its own compliance monitoring results.

1.3 Requirements of the Rule: States or Other Primacy Agencies

1.3.1 Special Primacy Requirements [40 CFR 142.16]

To receive primacy for the Stage 2 DBPR, states must adopt regulations no less stringent than this rule. States must submit revisions to their programs, regulations, or authorities no later than January 4, 2008, although states can request an extension of up to 2 years.

In addition, if a state elects to use its authority to modify wholesale system and consecutive system monitoring requirements on a case-by-case basis, the state must describe how it will implement a procedure for addressing the issue in its primacy application. The procedure must ensure that all systems have at least one compliance monitoring location. The special primacy requirements for the Stage 2 DBPR are discussed in section 4.4 of this guidance.

1.3.2 Records Kept by States [40 CFR 142.14]

The current regulations in §142.14 require states with primacy to keep various records, including system inventories, state approvals, enforcement actions, the issuance of exemptions, and analytical results, to determine compliance with MCLs, MRDLs, and treatment technique requirements.

The Stage 2 DBPR requires that the state keep records related to any decisions made pursuant to IDSE requirements [§141, Subpart U] and Stage 2 DBPR compliance monitoring requirements [§141, Subpart V]. Specifically:

- IDSE monitoring plans, plus any modifications made by the state, must be kept until replaced by approved IDSE Reports.
- System IDSE Reports and 40/30 Certifications, plus any modifications made by the state, must be kept until replaced or revised in their entirety.
- Operational evaluations submitted by a system must be kept for 10 years following submission.

1.3.3 State Reporting Requirements [40 CFR 142.15]

EPA currently requires states to report information such as violations, variance and exemption status, and enforcement actions to EPA under §142.15. The Stage 2 DBPR does not add any additional reporting requirements for states.

1.4 Summary of Action Dates

1.4.1 Applicability and Compliance Dates

The Stage 2 DBPR applies to all CWSs and NTNCWSs that add a primary or residual disinfectant other than UV or deliver water that has been treated with a primary or residual disinfectant other than UV. The IDSE requirements apply to all CWSs and NTNCWSs serving at least 10,000 people that add a primary or residual disinfectant other than UV or deliver water that has been treated with a primary or residual disinfectant other than UV. Table 1-8 summarizes key compliance dates required (**bold**) by the Stage 2 DBPR as well as suggested action dates. The compliance dates are designed to allow systems to comply simultaneously with the Stage 2 DBPR and the LT2ESWTR in order to balance risks associated with DBPs with risks associated with microbial pathogens.

Note the term "state" or "states" is used in the following and is used to refer to all types of primacy agencies including U.S. territories, Indian tribes, and EPA Regions.

Table 1-8. Summary of Action Dates for the Stage 2 DBPR

Date	Stage 2 DBPR Action
January 4, 2006	Final rule is published in *Federal Register*.
STATES	
January 4, 2006	States are encouraged to begin identifying affected systems.
January 4, 2006	States are encouraged to begin updating their data management system.
January 4, 2006	States are encouraged to begin determining how they will address special primacy conditions of the rule related to wholesale and consecutive system monitoring.
January 4, 2006	States are encouraged to begin coordinating with EPA and communicating with systems regarding the IDSE requirements.
April 1, 2006	States are encouraged to communicate with affected systems regarding Stage 2 DBPR requirements.
September 30, 2007	**States must contact systems on Schedule 1 to approve Standard Monitoring Plan or SSS Plan, or contact system if review is not complete.**
October 4, 2007	States are encouraged to submit final primacy applications or extension requests to EPA.
January 4, 2008	**Final primacy applications must be submitted to EPA, unless granted an extension. [§142.12(b)(1)]**
March 31, 2008	**States must contact systems on Schedule 2 to approve Standard Monitoring Plan or SSS Plan, or contact system if review is not complete.**
September 30, 2008	**States must contact systems on Schedule 3 to approve Standard Monitoring Plan or SSS Plan, or contact system if review is not complete.**
March 31, 2009	**States must contact systems on Schedule 4 to approve Standard Monitoring Plan or SSS Plan, or contact system if review is not complete.**
April 1, 2009	**States must approve IDSE Reports for systems on Schedule 1 or contact the systems to inform them the states review is not complete.**
October 1, 2009	**States must approve IDSE Reports for systems on Schedule 2 or contact the systems to inform them the states review is not complete.**
October 4, 2009	States with approved extension agreements are encouraged to submit final primacy applications to EPA.
January 4, 2010	**Final primacy applications must be submitted to EPA for systems with a full 2 year extension. [§142.12(b)(1)]**
April 1, 2010	States should begin determining whether to grant up to a 2-year extension for systems requiring capital improvements to meet Stage 2 DBPR.
October 1, 2010	**States must approve IDSE Reports for systems on Schedule 3 and 4 or contact the systems to inform them the states review is not complete.**

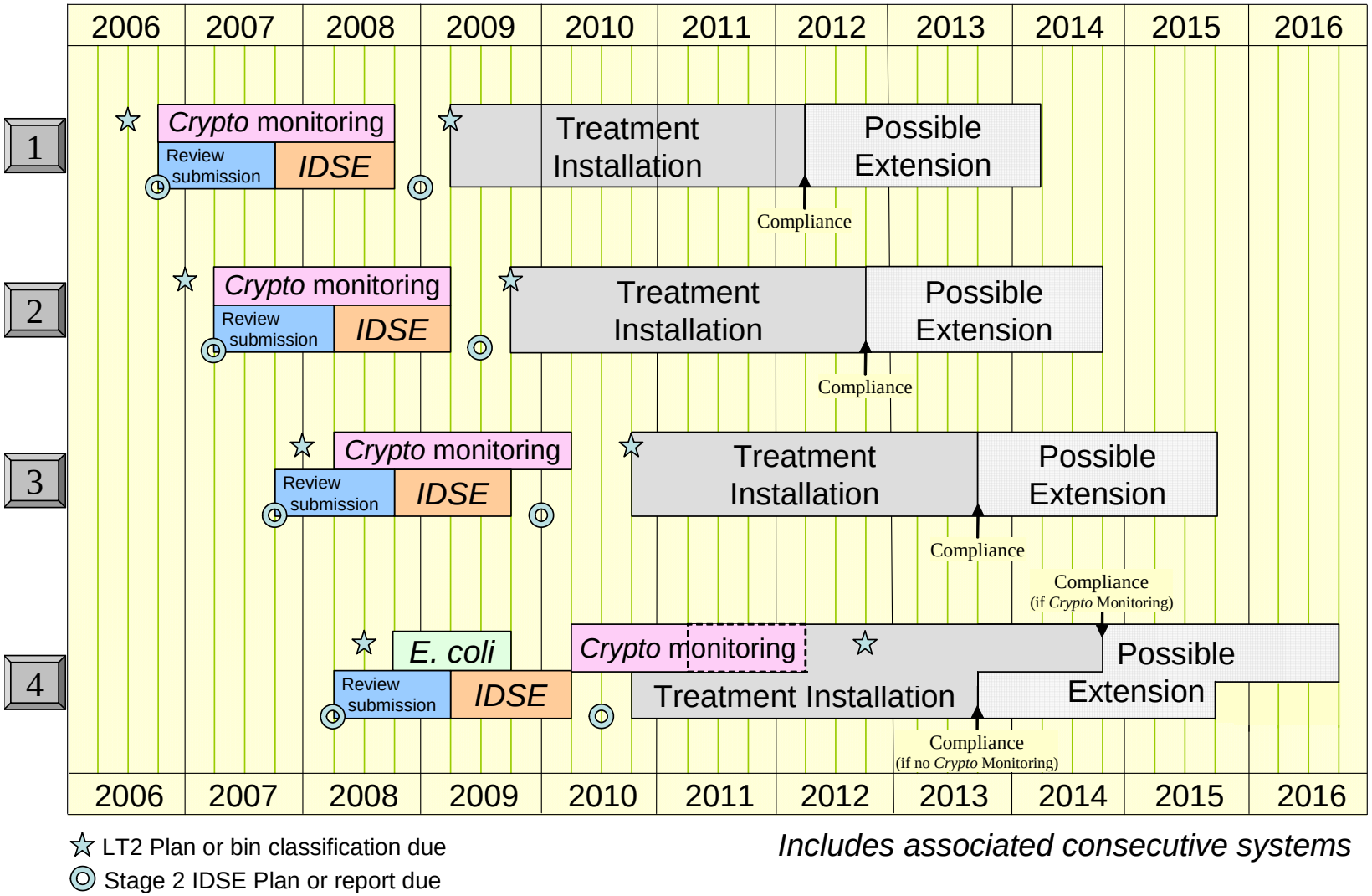
Date	Stage 2 DBPR Action
SCHEDULE 1 SYSTEMS	
October 1, 2006	**CWSs and NTNCWSs on Schedule 1 must submit Standard Monitoring Plan or SSS Plan or 40/30 Certification to the state.**
October 1, 2007	**CWSs and NTNCWSs on Schedule 1 whose Standard Monitoring Plan or SSS Plan has been approved or who have not heard back from the state should begin monitoring according to their plan.**
October 1, 2008	**CWSs and NTNCWSs on Schedule 1 must complete their IDSE before this date.**
January 1, 2009	**CWSs and NTNCWSs on Schedule 1 must submit their IDSE Report.**
April 1, 2012	**Systems on Schedule 1 must begin complying with Stage 2 DBPR monitoring requirements and LRAA MCLs for TTHM and HAA5. [§141.620]**
SCHEDULE 2 SYSTEMS	
April 1, 2007	**CWSs and NTNCWSs on Schedule 2 must submit Standard Monitoring Plan or SSS Plan or 40/30 Certification to the state.**
April 1, 2008	**CWSs and NTNCWSs on Schedule 2 whose Standard Monitoring Plan or SSS Plan has been approved or who have not heard back from the state should begin monitoring according to their plan.**
April 1, 2009	**CWSs and NTNCWSs on Schedule 2 must complete their IDSE before this date.**
July 1, 2009	**CWSs and NTNCWSs on Schedule 2 must submit their IDSE Report.**
October 1, 2012	**Systems on Schedule 2 must begin complying with Stage 2 DBPR monitoring requirements and LRAA MCLs for TTHM and HAA5. [§141.620]**
SCHEDULE 3 SYSTEMS	
October 1, 2007	**CWSs and NTNCWSs on Schedule 3 must submit Standard Monitoring Plan or SSS Plan or 40/30 Certification to the state.**
October 1, 2008	**CWSs and NTNCWSs on Schedule 3 whose Standard Monitoring Plan or SSS Plan has been approved or who have not heard back from the state should begin monitoring according to their plan.**
October 1, 2009	**CWSs and NTNCWSs on Schedule 3 must complete their IDSE before this date.**
January 1, 2010	**CWSs and NTNCWSs on Schedule 3 must submit their IDSE Report.**
October 1, 2013	**Systems on Schedule 3 must begin complying with Stage 2 DBPR monitoring requirements and LRAA MCLs for TTHM and HAA5. [§141.620]**
SCHEDULE 4 SYSTEMS	
April 1, 2008	**CWSs on Schedule 4 must submit Standard Monitoring Plan or SSS Plan or 40/30 Certification to the state.**
April 1, 2009	**CWSs on Schedule 4 whose Standard Monitoring Plan or SSS Plan has been approved or who have not heard back from the state should begin monitoring according to their plan.**
April 1, 2010	**CWSs on Schedule 4 must complete their IDSE before this date.**
July 1, 2010	**CWSs on Schedule 4 must submit their IDSE Report.**

Date	Stage 2 DBPR Action
October 1, 2013	**Systems on Schedule 4 that are not required to monitor for *Cryptosporidium* under LT2ESWTR [§141.701(a)(4)] must begin complying with Stage 2 DBPR monitoring requirements and LRAA MCLs for TTHM and HAA5. [§141.620]**
October 1, 2014	**Systems on Schedule 4 that are required to monitor for *Cryptosporidium* under LT2ESWTR [§141.701(a)(4) or (a)(6)] must begin complying with Stage 2 DBPR monitoring requirements and LRAA MCLs for TTHM and HAA5. [§141.620]**
CONSECUTIVE SYSTEMS	
April 1, 2009	**All 100 percent purchasing systems must monitor for chlorine and chloramines as specified under the Stage 1 DBPR. [§141.624]**

1.4.2 Timeline for the Stage 2 DBPR

Figure 1-3 depicts the Stage 2 DBPR and LT2ESWTR requirements and implementation timeline for states and systems. The LT2ESWTR was promulgated concurrently with the Stage 2 DBPR to ensure that microbial protection is not compromised by efforts to reduce exposure to disinfection byproducts.

Figure 1-3. Implementation Timeline for the Stage 2 DBPR



LT2 Plan or bin classification due

Stage 2 IDSE Plan or report due

Includes associated consecutive systems

References

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Section 2

Resources and Guidance

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In addition to this implementation guidance document, a variety of resource materials and technical guidance documents have been prepared by EPA to facilitate understanding and implementing the Stage 2 DBPR. This section is an overview of each of these resources and includes instructions on how to obtain the documents.

2.1 Technical Guidance Manuals

The following six technical guidance manuals are being developed to support the Stage 2 DBPR. These manuals will aid EPA, state agencies, and affected PWSs in implementing this rule and will help ensure that the implementation among these groups is consistent.

- The *Initial Distribution System Evaluation (IDSE) Guidance Manual* (EPA 815-B-06-002) provides guidance on conducting the IDSE. The manual discusses the requirements and the implementation of IDSE sampling required by the Stage 2 DBPR. The manual discusses the selection of monitoring sites, alternatives to monitoring, waivers, development of monitoring schedules, and preparation of the IDSE Report.

- The *Initial Distribution System Evaluation Guide for Systems Serving < 10,000 People For The Final Stage 2 Disinfectants and Disinfection Byproducts Rule* (EPA 815-B-06-001) provides guidance on conducting the IDSE, however this manual focuses on information that systems serving < 10,000 are most likely to use. It does not discuss the IDSE system specific study option.

- The *Operational Evaluation Guidance Manual* (EPA XXX-X-XX-XXX) provides guidance on possible approaches to identifying exceedances of operational evaluation levels, conducting an operational evaluation, and operational changes that systems may make to prevent recurrence of operational evaluation level exceedances.

- The *Small System Compliance Document* (EPA 815-R-07-014) provides a streamlined version of the Stage 2 DBPR requirements for systems serving fewer than 10,000 people.

- The *Consecutive System Guidance Manual* (EPA XXX-X-XX-XXX) provides guidance on complying with Stage 2 DBPR monitoring requirements and MCLs to systems that purchase finished water.

- The *Simultaneous Compliance Guidance Manual for the Long Term 2 and Stage 2 DBP Rules* (EPA 817-D-06-003) provides guidance on how to avoid and resolve various potential conflicts that may arise as systems comply with the Stage 2 DBPR and the LT2ESWTR.

For more information, contact EPA's Safe Drinking Water Hotline, (800) 426-4791, e-mail the Stage2 Inbox, stage2mdbp@epa.gov, or see the Office of Ground Water and Drinking Water Web page. Reference and guidance documents are located at www.epa.gov/safewater/disinfection/stage2/compliance.html#pws.

2.2 Rule Presentation

Presentations that can be used for conducting Stage 2 DBPR training will be available on the EPA Web site: www.epa.gov/safewater/disinfection/disinfection/training.html. To receive information on training

presentations and to check the Drinking Water Academy (DWA) Training Calendar or join the LT2/Stage 2 Listserv, e-mail the Stage 2 Inbox at stage2mdbp@epa.gov.

2.3 Factsheets and Quick Reference Guides

Factsheets and Quick Reference Guides for the Stage 2 DBPR may be useful for conveying basic information about the rule to water systems, new personnel, and stakeholders. These are stand-alone documents that are included in Appendix C of this guidance and are available online at www.epa.gov/safewater/disinfection/stage2/compliance.html#pws. They are:

- Fact Sheet: Stage 2 Disinfectants and Disinfection Byproduct Rule.
- Factsheet: Stage 2 DBPR IDSE 40/30 Certification and Very Small System Waiver.
- Factsheet: Stage 2 DBPR IDSE Standard Monitoring.
- Factsheet: Stage 2 DBPR IDSE System Specific Studies.
- Stage 2 Disinfectants and Disinfection Byproduct Rule: A Quick Reference Guide For Schedule 1 Systems.
- Stage 2 Disinfectants and Disinfection Byproduct Rule: A Quick Reference Guide For Schedule 2 Systems.
- Stage 2 Disinfectants and Disinfection Byproduct Rule: A Quick Reference Guide For Schedule 3 Systems.
- Stage 2 Disinfectants and Disinfection Byproduct Rule: A Quick References Guide For Schedule 4 Systems.

2.4 Frequently Asked Questions

Questions and Answers (Q&As) on the Stage 2 DBPR are provided in this section. These questions have been asked of EPA through the Safe Drinking Water Hotline, implementation training, or other means. For additional questions and updates to the answer provided in this document, visit EPA's Web site at www.epa.gov/safewater/disinfection/stage2.

System Schedules

Q1: How is the population determined in order to categorize systems into the schedules? Are all the populations of the systems in a combined distribution system added together or is the schedule based on the single largest system in the combined distribution system?

A1: Your population is based on the number of consumers your system serves directly. However, if you are a consecutive or wholesale system (i.e., sell or buy finished water to or from another water system), your schedule is based on the population served by the largest system in your combined distribution system (not the combined population of all systems). If you are not a consecutive or wholesale system, your schedule is based on the population served by your individual system.

Q2: What are the different system schedules and their population numbers?

A2: There are four compliance schedules. The four schedules are:

If you are this kind of system:	You are on IDSE schedule number
Systems serving 100,000 or more people OR belonging to a combined distribution system in which the largest system serves 100,000 or more people	1
Systems serving 50,000 to 99,999 people OR belonging to a combined distribution system in which the largest system serves 50,000 to 99,999	2
Systems serving 10,000 to 49,999 OR belonging to a combined distribution system in which the largest system serves 10,000 to 49,999	3
Systems serving fewer than 10,000 people and/or belonging to a combined distribution system in which the largest system serves fewer than 10,000	4

IDSE

General

Q3: Are systems required to conduct Stage 1 DBPR compliance monitoring concurrent with Stage 2 DBPR IDSE monitoring?

A3: Yes, systems regulated under the Stage 1 DBPR are required to collect their Stage 1 DBPR compliance sample as well as conduct Stage 2 DBPR IDSE monitoring.

Q4: How should systems monitor during the interval between the end of IDSE monitoring and the beginning of Stage 2 DBPR compliance sampling?

A4: Systems should continue Stage 1 DBPR monitoring or work with their primacy agency to begin Stage 2 DBPR compliance sampling earlier than required. This interval is built into the Stage 2 DBPR to accommodate systems that may need to make significant changes to their distribution system to meet the requirements of the Stage 2 DBPR.

Q5: If a system modifies its distribution system after completing its IDSE, is it required to complete a new IDSE?

A5: No new IDSE Report is required, but the system should work with their primacy agency to change their Stage 2 DBPR Compliance Monitoring Plan to address the changes to the distribution system.

Q6: Should IDSE samples be collected during the warmest months?

A6: IDSE samples must be collected in the month of peak historical TTHM/HAA5 formation. The standard monitoring period or system specific study plan must include sampling during the peak historical month for TTHM or HAA5 levels or the month of warmest temperature (if the system does not have adequate historical data to determine the peak month).

Q7: What happens to a system that does not submit an IDSE plan?

A7: The system would be in violation if the system did not qualify for a VSS Waiver, submit a 40/30 Certification, or conduct standard monitoring or an SSS IDSE by the compliance deadline. The same is true for the IDSE Report for systems that conducted standard monitoring or an SSS IDSE. The primacy agency will determine what enforcement action will be taken.

Q8: Is there reduced IDSE monitoring?

A8: No, there is no reduced IDSE monitoring option available.

Standard Monitoring

Q9: If a system is required to take 8 high TTHM samples, can all 8 samples be taken at the same location?

A9: No, the monitoring plan must identify 8 different sites with expected high TTHM levels. These sites also must not be the same location as where the system currently takes their required Stage 1 DBPR TTHM/HAA5 samples.

Q10: What if a system's high TTHM site and high HAA5 site are the same location?

A10: A system cannot use the same site as both a high TTHM and high HAA5 site. If one site has been identified as potentially high for both TTHM and HAA5 the system should select it for whichever type they have fewer sites identified for. Keep in mind, each site will be sampled for both TTHM and HAA5.

Q11: How should systems with multiple entry points to the distribution system complete standard monitoring if only one near entry point site is required?

A11: If a system has multiple entry points to the distribution system but only one entry point sample is required, the system should sample near the entry point with the highest flow.

Q12: How should a system with fewer entry points to the distribution system than the required number of near an entry point sites complete standard monitoring?

A12: These systems should sample near all entry points to the distribution systems and make up the additional number of sites by alternating between high TTHM and high HAA5 sites, beginning with high TTHM, to obtain the necessary number of samples.

Q13: If a consecutive system has multiple entry points, does a sample need to be taken at each meter?

A13: No, the system only needs to monitor at the number of entry points required by the Stage 2 DBPR.

System Specific Study

Q14: Can the state approve an SSS Plan using existing monitoring results with a fewer number of sites required in Stage 2 DBPR?

A14: No, the number of samples required by the rule is the minimum number EPA believes is necessary for a system to determine their appropriate Stage 2 DBPR monitoring sites. The SSS using existing monitoring results and standard monitoring requirements were developed to be generally equivalent. The number of sites required for an existing monitoring SSS is approximately the number required for that system size under standard monitoring plus the number likely under Stage 1 DBPR compliance monitoring.

40/30 Certification

Q15: Can a system receive 40/30 Certification if individual samples exceed 40/30 levels, but annual averages for TTHM and HAA5 are below these levels?

A15: No, a system cannot receive 40/30 Certification if any samples exceed 40/30 during the 8 consecutive quarters specified in the sampling schedule, even if the system's averages are below 40/30.

Q16: If a system applies for a 40/30 Certification and does not qualify, what monitoring schedule will the system be on?

A16: Depending on timing, a system may be able to rejoin its original IDSE monitoring schedule. If this is not possible, the primacy agency will work with the system to develop a schedule that is appropriate.

Q17: Will a reporting violation make a system ineligible for a 40/30 Certification (e.g., a system submitted its quarterly data on April 22, 12 days after the required date of April 10)?

A17: If all other 40/30 Certification requirements are met, the system could still qualify for a certification. However, if a system has any TTHM or HAA5 monitoring violations during the period specified or fails to provide requested information to the state, including compliance monitoring results, the state may require standard monitoring or an SSS.

Very Small System Waivers

Q18: What is the timeline for Very Small System Waivers?

A18: Systems serving fewer than 500 people do not need to take action to receive a VSS Waiver, provided they have existing TTHM or HAA5 data. In most cases, EPA and states will work together to send letters to very small systems informing them that they have received a VSS Waiver and do not need to take any further action to comply with IDSE requirements. However, EPA or the state can also request that the system conduct standard monitoring, even if the system meets the criteria for the waiver.

Consecutive Systems

Q19: How would a system that is served by both surface water and ground water sources comply with Stage 2 DBPR?

A19: A system must follow the monitoring schedule for surface water systems if any portion of its water comes from a surface water source, including purchased water.

Q20: Are consecutive systems responsible for providing public notifications of violations or Consumer Confidence Reports (CCRs)?

A20: Yes. The wholesale system must provide violation information to its consecutive systems so that they can appropriately notify their users.

Q21: How does Stage 2 DBPR address emergency connections?

A21: Primacy agencies will have the discretion to determine whether systems receiving water from another system for emergency purposes should be considered as part of a combined distribution system.

Stage 2 DBPR Compliance Monitoring

Q22: Does increased monitoring affect the entire system or only the monitoring site that exceeded the trigger value?

A22: If a monitoring site triggers increased monitoring, the entire system must switch to increased monitoring. Increased and reduced monitoring cannot be determined on a site-by-site basis.

Q23: Can systems on Stage 1 DBPR reduced monitoring that receive a VSS Waiver remain on reduced monitoring for Stage 2 DBPR?

A23: These systems can remain on reduced monitoring if they have not changed monitoring locations and if they meet the qualifications for Stage 2 DBPR reduced monitoring.

Notification to the Public

Q24: Is there language in the CCR Rule that explains that IDSE monitoring is not for compliance purposes?

A24: There is no specific language in the CCR Rule that addresses this. Systems can include an explanation of IDSE sampling in their CCRs if they choose to do so.

Information Collection and Reporting

Q25: What will the IDSE tool do?

A25: The IDSE tool contains two features: the Wizard and the Plan/Report. The Wizard helps systems determine their IDSE requirements and select the best IDSE option for their system. The Plan/Report tool then creates Custom Forms for the system size and type that can be submitted electronically to the primacy agency.

Q26: When a system is submitting an electronic IDSE plan or report using the online IDSE Tool, can a system log in, work on the electronic file, log out, and come back later?

A26: Systems will be able to log on, work, save their work, and come back as many times as needed. However, once the plan or report is submitted, the IDSE tool considers the submission official and does not allow additional submissions to be made. The system can only make further changes by working with the primacy agency, or by sending an email to the Stage 2 Inbox at stage2mdbp@epa.gov.

Q27: Not all months have 30 days and not all quarters have 90 days. How will this affect compliance tracking?

A27: The term "every 90 days" was included to eliminate the possibility that a system would take quarterly samples at the end of one quarter and then immediately again at the beginning of next quarter. Samples are not temporally distributed as intended when collected in this manner. Using the term "every 90 days" should correct this. However, it is expected that states will use their discretion to account for various circumstances. The intent is to have samples taken approximately every 90 days.

Other

Q28: How would a system that intermittently disinfects comply with the Stage 2 DBPR?

A28: The system would monitor only during the quarter in which disinfection was provided. If the system is on yearly monitoring, it would monitor during the month of highest disinfection byproducts formation. The state will work with each system to further customize a monitoring schedule if needed.

Q29: Are systems required to file a report every time an operational evaluation level is exceeded?

A29: Yes. Any time an operational evaluation level is exceeded, the system is required to conduct an evaluation, write a report, and submit it to the state no later than 90 days after notification. This could happen at multiple locations or at a single location. The state can reduce the scope of the evaluation at its discretion on a case-by-case basis.

Section 3

State Implementation

EPA expects to undertake necessary rule implementation activities during the period of early implementation. During the early implementation period, the state may elect to undertake some, or all, of the implementation activities, in cooperation with EPA. This will facilitate continuity of implementation and ensure that system-specific advice and decisions are made with the best available information and are consistent with existing state program requirements.

3.1 Overview of Implementation

The Stage 2 DBPR requires systems to take specific actions to comply with the rule. Monitoring, reporting, performance, and follow-up requirements should be clearly defined to assist systems' understanding of how the rule will affect them and what they must do to comply. To meet this goal, the main implementation activities expected to face all primacy agencies include the following:

- Identify affected systems.
- Communicate Stage 2 DBPR requirements to affected systems.
- Update data management systems.
- Address special primacy conditions of the Stage 2 DBPR.
- Review and approve 40/30 Certification.
- Review and approve IDSE plans and reports.
- Review Stage 2 DBPR (Subpart V) monitoring plans.
- Ensure systems meet revised source water TOC criteria for reduced DBP monitoring.
- Ensure systems meet revised criteria for reduced bromate monitoring.
- Evaluate system requests for compliance schedule extensions.
- Evaluate system compliance with LRAA against Running Annual Average.
- Evaluate system requests for limiting the scope of an operational evaluation.
- Evaluate operational evaluations.

States must approve Standard Monitoring Plans, study plans, and IDSE Reports or contact the system to notify them that the review is not complete. If states fail to do so within the timeframe in the rule, the system can consider them approved and begin monitoring in accordance with their plans and reports. Although the rule does not explicitly require states to approve monitoring plans, EPA strongly recommends that states undertake this activity. These various plans and reports ensure that monitoring locations are selected appropriately and in a manner to provide data to best protect public health under the Stage 2 DBPR.

Section 3 discusses each of the items listed above. To help states' implementation efforts, the guidance in this section and in section 4 may make suggestions and offer alternatives that go beyond the minimum primacy agency requirements specified in the subsections of §142.16. Such suggestions are prefaced by "may" or "should" and are to be considered advisory. They are not required elements of states' applications for program revision.

Figure 3-1 shows a timeline with system activities on the top and primacy agency activities on the bottom. It depicts requirements and implementation of Stage 2 DBPR .

Figure 3-1. Timeline of System and Primacy Agency Activities

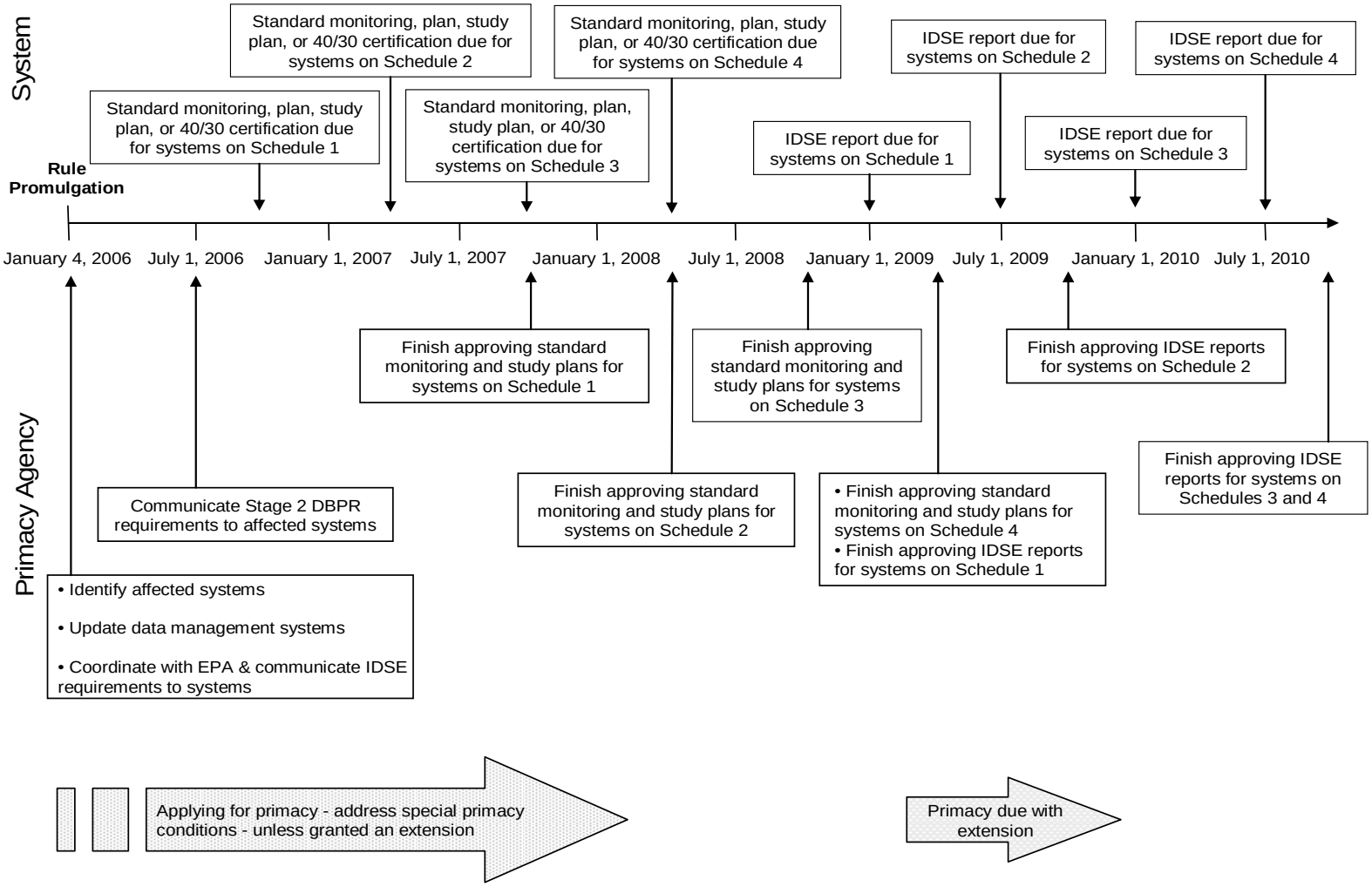
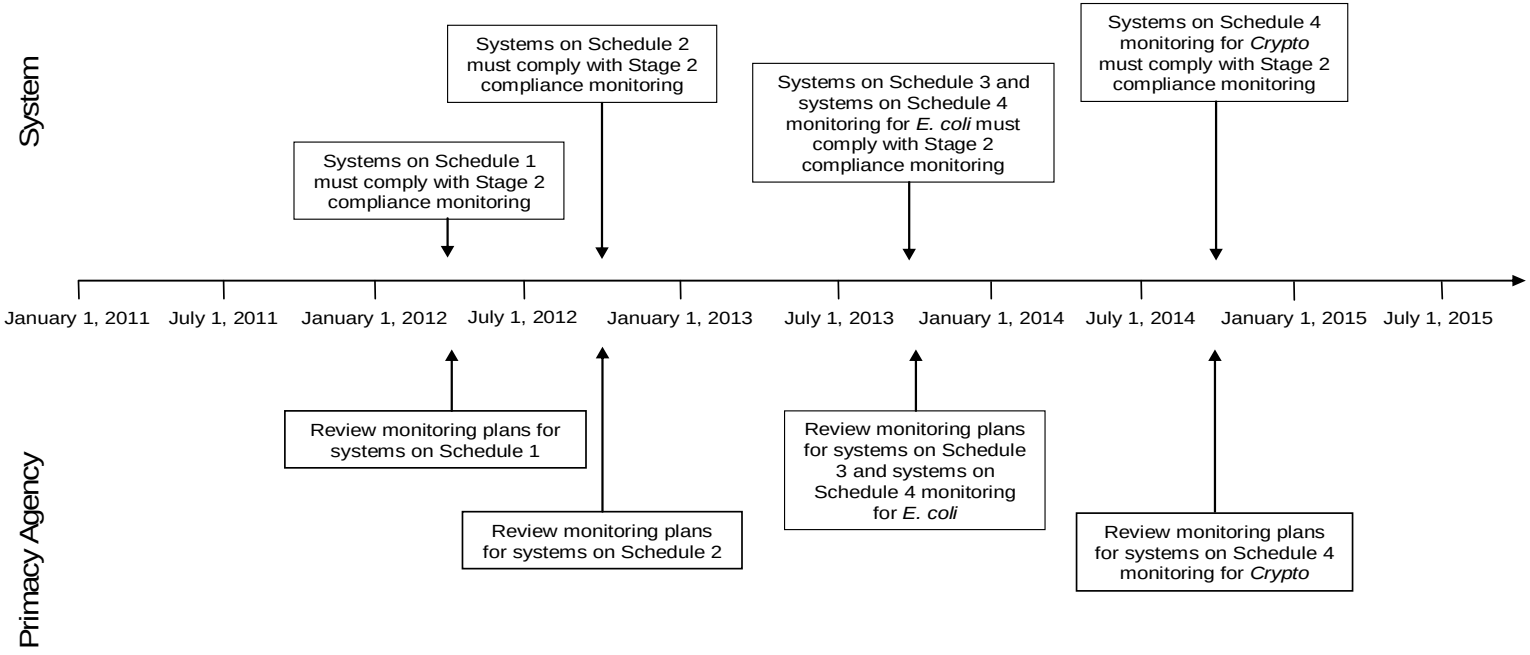


Figure 3-1. Timeline of System and Primacy Agency Activities (cont.)



Note: Consecutive or wholesale systems must comply at the same time as the system with the earliest compliance dates in the combined distribution system.

3.2 Identifying Affected Systems

3.2.1 General Provisions

The Stage 2 DBPR has two distinct sections. The Initial Distribution System Evaluation (IDSE) section and the compliance monitoring section.

- The IDSE portion of the rule applies to all CWSs and NTNCWSs serving more than 10,000 people that add a primary or residual disinfectant other than UV or deliver water that has been treated with a primary or residual disinfectant other than UV [§141.600(b)].

- The compliance monitoring portion of the rule applies to all CWSs and all NTNCWSs that add a primary or residual disinfectant other than UV or deliver water that has been treated with a primary or residual disinfectant other than UV [§141.620(b)].

The latter portion of this applicability statement clarifies that the provisions of the Stage 2 DBPR unambiguously apply to consecutive systems that do not add a disinfectant but deliver disinfected water. These systems are subject to all regulatory requirements.

States may wish to query or sort their database or other inventory information to list all affected systems. This data will be useful when states are performing various implementation activities (e.g., mailing letters to systems, determining standard monitoring requirements) and tracking compliance.

3.2.2 Initial Distribution System Evaluation (IDSE)

The IDSE portion of the rule is designed to help systems acquire adequate information about their distribution systems and DBP levels to select Stage 2 DBPR compliance monitoring sites that represent high TTHM and HAA5 levels throughout the distribution system. States should ensure that systems consider all available information in choosing the distribution system's most representative locations for Stage 2 DBPR compliance monitoring. Stage 2 DBPR monitoring sites should consider information collected during the IDSE as well as Stage 1 DBPR monitoring sites.

States may wish to further sort their list from 3.2.1 into sub-categories, as not all systems will need to receive the same information during the same timeframe. Note that Stage 2 DBPR requirements are based on source type and population served rather than the number of treatment plants (the approach used for Stage 1 DBPR requirements). In addition, compliance deadlines are based on the population of the largest system in the combined distribution system. The following sub-categories are suggested:

- Systems on Schedule 1–Serving ≥ 100,000 people or that are part of a combined distribution system in which the largest system serves ≥ 100,000 people.

- Systems on Schedule 2–Serving 50,000-99,999 people or that are part of a combined distribution system in which the largest system serves 50,000-99,999 people.

- Systems on Schedule 3–Serving 10,000-49,999 people or that are part of a combined distribution system in which the largest system serves 10,000-49,999 people.

- Systems on Schedule 4–Serving < 10,000 people or that are part of a combined distribution system in which the largest system serves < 10,000 people.

This last category may need to be further separated into the following sub-categories as they are subject to different requirements for the reasons cited below:

- NTNCWSs serving < 10,000 people are not required to perform an IDSE.

- Systems serving < 500 people, if they collected TTHM and HAA5 samples that comply with the Stage 1 DBPR, are granted a waiver from conducting additional monitoring under the IDSE. VSS Waivers are discussed in more detail in section 3.6.

Sections 3.6 through 3.11 further discuss the IDSE and systems' options to meet the IDSE requirements.

3.2.3 Wholesale and Consecutive Systems

The Stage 2 DBPR provides special clarification on the sharing of responsibilities between consecutive systems and the wholesale systems that supply them. This clarification extends public health protection to consecutive systems, which were not specifically addressed under the Stage 1 DBPR.

States that did not require consecutive systems to monitor under Stage 1 DBPR may want to pay particular attention to ensuring that these systems are aware that both the IDSE and monitoring portions of the Stage 2 DBPR will apply to them.

States may wish to further sort their list from 3.2.1 to denote which systems are wholesale and consecutive systems. These systems will have to comply with Stage 2 DBPR requirements at the same time as the largest system in their combined distribution system, regardless of the compliance timeframe associated with their own population served. In addition, systems that are 100 percent purchasing systems may not have had to comply with the Stage 1 DBPR and may need more communication regarding their responsibilities for complying with the Stage 2 DBPR.

To account for complicated distribution system relationships and other factors, states may exercise some flexibility in deciding whether:

- Emergency and seasonal connections between a wholesale and consecutive system makes them part of the same combined distribution system.

- A consecutive system that produces some of its own finished water is part of the same combined distribution system.

- The interconnections between individual PWSs make them part of the same or different combined distribution system(s).

States should consider the following factors when deciding whether systems should be considered part of a combined distribution system:

- Frequency, duration, and regularity of the connection.

- Volume and percent of finished water the consecutive system receives from the wholesale system.

- Quality (with respect to DBP or precursor levels) of the finished water provided by the wholesale system.

If the state lacks sufficient information to make a determination regarding connection type, the default decision is that the water system is part of a combined distribution system.

3.2.4 Seasonal Systems

Some systems, such as those that serve resort communities, have dramatic seasonal fluctuations in flow as well as population. When reviewing submittals for these systems, EPA or the state should consider issues such as changes in demand, peak historic month, the use of seasonal sources and the quality of those sources. For example, water age may be a factor for these systems during periods when there is a reduction in the transient population. EPA or the state will have to consider these seasonal variations in population as well as transient and nontransient populations in making decisions about IDSE requirements and determining if the system has adequately represented their system in their IDSE and eventually compliance monitoring.

3.3 Communicate Stage 2 DBPR Requirements to Affected Systems

3.3.1 Communicating IDSE Requirements and Timeframes

As noted previously, CWSs and all NTNCWSs serving at least 10,000 people that use or deliver water that has been treated with a primary or residual disinfectant other than UV are subject to the IDSE requirements [§141.600(b)]. Systems have four options for complying with the IDSE. They can complete a year of standard monitoring or an SSS, or they can qualify for a 40/30 Certification or a Very Small System Waiver. These options are discussed in detail in sections 3.6 through 3.11.

States should ensure that systems are aware of these requirements, can determine which option is the most appropriate for them, and know when each requirement must be met. Note that states will generally not have primacy during implementation of the IDSE for systems on the earliest schedules and will need to coordinate with EPA if they wish to be involved in this process.

EPA or the state should communicate the IDSE requirements to systems as soon as possible because they may need consultation if they have questions regarding which alternative they will use to comply with this requirement. States may wish to provide additional information to systems on how to conduct standard monitoring or an SSS. Note that systems should receive a letter from EPA or the state notifying them of their correct IDSE schedule number. Systems should not proceed with conducting the IDSE before receiving this letter. A sample letter is provided in Example 3-1.

The rule staggers deadlines to allow for a more even workload and greater opportunity for Primacy Agency involvement (e.g., through plan review and approval). The staggered schedule also provides time for analytical laboratories to build up capacity as needed to accommodate the sample analysis needs of systems. The standard monitoring and SSS Plan, monitoring, and IDSE Report submission dates are shown in Table 3-1.

Systems that conduct standard monitoring or an SSS must first submit a plan to EPA or the state for review and approval. EPA or the state has 12 months to review and consult with the system about their plan. If they do not approve the plan or contact the system to notify them that the review is not complete by 12 months from the required submission date, the plan or certification is considered approved. The system must complete the standard monitoring or SSS by the date specified in Table 3-1 and then must prepare and submit the IDSE Report. EPA or the state has 3 months—or 9 months if the system conducts *Cryptosporidium* monitoring under Schedule 3—to approve the IDSE Report, or the report will be considered approved and the system will be required to implement the recommended Stage 2 DBPR compliance monitoring as required.

Table 3-1. Deadlines for IDSE Plans and Reports

	Submit Standard Monitoring Plan or SSS Plan or 40/30 Certification to the State by the Date Below or Receive VSS Waiver	State Must Review Standard Monitoring Plan, SSS Plan, or 40/30 Certification by	Systems Must Submit IDSE Report to the State by	State Must Review IDSE Report by
Schedule 1	October 1, 2006	September 30, 2007	January 1, 2009	March 31, 2009
Schedule 2	April 1, 2007	March 31, 2008	July 1, 2009	September 30, 2009
Schedule 3	October 1, 2007	September 30, 2008	January 1, 2010	September 30, 2010
Schedule 4	April 1, 2008	March 31, 2009	July 1, 2010	September 30, 2010

States may wish to remind NTNCWSs that serve fewer than 10,000 people and systems that qualify for a VSS Waiver or 40/30 Certification that they do not need to complete an IDSE Report, but will need to develop and submit a Stage 2 DBPR Compliance Monitoring Plan. States may also want to notify systems that conduct standard monitoring or an SSS that they do not need to develop a Compliance Monitoring Plan if they include all information required by the plan, including compliance calculation procedures, in their IDSE Report.

States may want to consider conducting an on-site IDSE training and involve personnel from nearby states. It might be helpful to set up a computer with the IDSE tool and walk the participants through the process of using the tool. States should encourage all systems within a combined distribution system to attend training sessions together.

Some states have implemented an Area-Wide Optimization Program (AWOP). An AWOP is a strategy for targeting groups of higher risk systems for state assistance to maximize the public health protection that water treatment plants provide. Although states have a variety of tools to aid systems, ranging from sanitary surveys to direct technical assistance, their resources are limited. Consequently, states should prioritize their efforts according to the gravity of the potential public health risks posed by poorly performing water treatment plants. The challenge states face is to match their oversight of, and assistance to, water systems with the estimated risks posed to public health.

The IDSE portion of the Stage 2 DBPR, specifically the standard monitoring requirements, can be used to work with the AWOP. Development of a Standard Monitoring or SSS Plan will probably be the most resource intensive step for systems. They will need to compile and review a variety of information, including distribution system layout, system operating data, and water quality data, when considering where to select monitoring sites. Some systems may not be comfortable with this level of analysis. Systems on Schedule 1 only have approximately 9 months from rule promulgation to develop their plan. An optimization approach for systematically identifying potential problem sites may benefit utilities.

Remember:

- Each individual system in a combined distribution system must conduct its own IDSE, basing its schedule on the population of the largest system in the combined distribution system.

- The rest of the IDSE requirements (e.g., number of samples, frequency of monitoring) are based on the individual system's population.

- Systems cannot conduct one IDSE for the entire combined distribution system.

- States may exclude systems that receive water from a wholesale system only on an emergency basis or receive only a small percentage and small volume of water from a wholesale system from a combined distribution system.

- EPA's *IDSE Guidance Manual* provides additional detail and examples for how to determine which systems are part of combined distribution systems and systems' standard monitoring or study plan and report due dates.

3.3.2 Communicating Stage 2 DBPR Compliance Requirements and Timeframes

Under the Stage 2 DBPR, sampling must be conducted at sites identified through the IDSE or as modified by the IDSE Report reviewer for systems that conducted standard monitoring or an SSS. For systems that did not conduct standard monitoring or an SSS, sampling must be conducted at Stage 1 DBPR sites and if necessary, any additional sites identified in the sampling plan [§141.620(d)].

In addition, compliance with the MCL of 0.080 mg/L for TTHM and 0.060 mg/L for HAA5 will be based on a LRAA rather than a system-wide running annual average.

All systems must develop a Stage 2 DBPR, or Subpart V, Compliance Monitoring Plan (see section 3.12) prior to the Stage 2 DBPR compliance date shown in Table 3-2. Systems that conducted standard monitoring or an SSS were required to submit an IDSE Report. This report contains many of the same elements as the Compliance Monitoring Plan. Generally, if a system includes their compliance calculation procedures in their IDSE Report, they can meet the requirements of both documents at the same time. (Note that this option is not available to systems if the state modifies their compliance monitoring requirements because they are part of a combined distribution system.) Subpart H systems serving more than 3,300 people must submit a copy of their monitoring plan to the state prior to the date that they conduct initial monitoring, and all systems must keep a copy of the plan on file for state and public review.

Table 3-2 identifies the deadline for compliance with Stage 2 DBPR MCLs. States should communicate compliance requirements with systems in advance of these deadlines.

Table 3-2. Compliance Schedule for Stage 2 DBPR

Schedule Number	Compliance Date for Stage 2 DBPR [1]
Schedule 1	April 1, 2012
Schedule 2	October 1, 2012
Schedule 3	October 1, 2013
Schedule 4	October 1, 2013 if no *Cryptosporidium* monitoring is required under §141.701(a)(4) OR October 1, 2014 if *Cryptosporidium* monitoring is required under §141.701(a)(4) or (a)(6)

1. States may grant systems up to an additional 24 months for compliance with MCLs and operational evaluation levels if capital improvements are necessary. See Appendix I for guidance on reviewing extension requests under Section 1412(b)(10) of the SDWA.

It is important to note that systems previously on reduced monitoring may not begin Stage 2 DBPR compliance monitoring on reduced monitoring. Systems can qualify for reduced monitoring only after

completing 1 year of routine monitoring under the Stage 2 DBPR Compliance Monitoring Plan [§141.623]. Changes in the criteria for reduced monitoring are discussed in section 3.15.

It is important that the states communicate these compliance monitoring changes from the Stage 1 DBPR to all systems affected by the Stage 2 DBPR. In particular, states should inform systems using ozone as a disinfectant of the new qualifications for reduced bromate monitoring, as discussed in section 3.15.2. States should also inform surface water systems that seeking to qualify for or remain on reduced TTHM/HAA5 monitoring for a reduced TTHM/HAA5 monitoring of the new TOC requirements as discussed in section 3.15.1.1.

3.3.2.1 Consecutive System Compliance with the Stage 1 DBPR

The Stage 1 DBPR did not specifically address consecutive systems, but under the Stage 2 DBPR, consecutive systems must begin complying with the Stage 1 DBPR requirements for chlorine and chloramines beginning April 1, 2009. States may also require systems to comply at an earlier date. As of this date, consecutive systems must not exceed the following maximum residual disinfectant levels (MRDLs) [§141.65(a)], which are the same as the maximum residual disinfectant level goals (MRDLGs) [§141.54]:

- 4.0 mg/L for chlorine (measured as Cl2)
- 4.0 mg/L for chloramines (measured as Cl2)

3.3.3 Methods of Communication

Written Notification

Providing written notice of a final rule to PWSs serves two purposes: 1) the receiving system obtains a formal notice of upcoming regulatory requirements and a timeline for compliance (in addition to EPA's publication of the rule in the *Federal Register*); and 2) the primacy agency has a hard-copy document that it may file and use in subsequent compliance tracking efforts.

Written notification can be in the form of a letter from the state to affected systems. The letter should include a summary of rule requirements and timeframes and direct the reader to an appropriate contact if questions arise. States should consider including factsheets or other summary materials with the letter. Appendix C of this guidance includes additional publications that are intended to be distributed to water systems through mailings, training sessions, or other educational forums. These publications are available at www.epa.gov/safewater/disinfection/stage2. They provide overviews of the Stage 2 DBPR to help systems understand the provisions of the rule and determine which provisions apply to their system. They also describe the benefits and general implications of the rule. Although valuable, these resources do not substitute for official rule language. States should consider mailing official rule language with the letter or including in the letter the Web site address where the regulatory language can be accessed.

A sample letter notifying systems of the Stage 2 DBPR requirements and their schedule number for completing the IDSE is provided in Example 3-1 (the example is for a Schedule 4 system). States may wish to develop similar letters and tailor the messages for the appropriate size categories covered by the rule, or to accommodate those systems for which the provisions are either limited or unique.

Example 3-1. Sample Letter Notifying Systems of Schedule Number

Please do not ignore this letter. Your system is required to comply with the new requirements based on the schedule listed below.

System Name
System Address
City State Zip

November XX, 2006

★★★ Important New Rule Roll Out ★★★
Stage 2 Disinfectants and Disinfection Byproduct Rule (Stage 2 DBPR) – Schedule 4

The Stage 2 DBPR was published in the *Federal Register* on January 4, 2006. The Stage 2 DBPR builds on existing regulations by requiring water systems to meet disinfection byproduct maximum contaminant levels (MCLs) at **each** disinfection byproduct monitoring site in the distribution system to better protect public health. In general, all community water systems (CWSs) and nontransient noncommunity water systems (NTNCWSs) that use **or** deliver water treated with a primary or residual disinfectant other than ultraviolet light are subject to the Stage 2 DBPR requirements. However, NTNCWS, serving less than 10,000 people do not have to comply with the Initial Distribution System Evaluation (IDSE) part of the Stage 2 DBPR (see below for an explanation of IDSE). Download an electronic copy of the Stage 2 DBPR from EPA's website at www.epa.gov/safewater/disinfection/stage2/regulations.html#rule.

The first major requirement of the Stage 2 DBPR is for systems to conduct an IDSE. The purpose of the IDSE is to identify locations in the distribution system that have the highest total trihalomethane (TTHM) and highest haloacetic acid (HAA5) concentrations. The locations in the distribution system with the highest TTHM and highest HAA5 concentrations will be used as Stage 2 DBPR compliance monitoring sites.

EPA and state records show that your system is required to comply with **Schedule 4** IDSE requirements. These requirements are based on the information that your system:

- Serves fewer than 10,000 people, and your system is not part of a combined distribution system where another system serves 10,000 or more people; and
- Provides water that has been treated with a primary or residual disinfectant other than ultraviolet light.

A combined distribution system is a group of water systems that buy/sell water from/to each other.

If you believe our records are incorrect please notify us at stage2mdbp@epa.gov as soon as possible.

By **April 1, 2008**, Schedule 4 systems will have to comply with IDSE requirements by submitting a standard monitoring plan, system specific study plan, or a 40/30 certification.

EPA recommends systems interested in a 40/30 Certification should review a table posted on the Stage 2 DBPR website at: www.epa.gov/safewater/disinfection/stage2/compliance.html to determine if your state may require information in addition to what is specified in the rule.

Systems that serve less than 500 people and that have previously collected TTHM and HAA5 samples may qualify for a very small system waiver and are exempt from this IDSE requirement, unless you hear otherwise from your state or from EPA.

Enclosed is a Quick Reference Guide that provides information on the requirements of the Stage 2 DBPR. In addition, EPA has developed a number of guidance documents and factsheets to help systems through this process that may be found at: www.epa.gov/safewater/disinfection/stage2/compliance.html.

Example 3-1. Sample Letter Notifying Systems of Schedule Number (cont.)

IDSE Guidance Material

The following materials only address the IDSE requirements and DO NOT cover other provisions of the Stage 2 DBPR.

- **Initial Distribution System Evaluation Guidance Manual For The Final Stage 2 Disinfectants and Disinfection Byproducts Rule** (EPA 815-B-06-002) – This manual is a comprehensive technical guidance document for all system sizes and types and all IDSE options.
- **Initial Distribution System Evaluation Guide for Systems Serving < 10,000 People For The Final Stage 2 Disinfectants and Disinfection Byproducts Rule** – This manual focuses on information that systems serving < 10,000 are most likely to use. It does not discuss the IDSE system specific study option.
- **IDSE Tool** – A web-based tool guides the user through the IDSE submission process. A **Wizard** reviews IDSE options and recommends the best IDSE option for your system. The IDSE Tool creates **Custom Forms** (based on population served and system type) your system can submit electronically to EPA's Information Processing and Management Center for EPA/State review. A web-base and downloadable version of the IDSE Tool are available on-line at www.epa.gov/safewater/disinfection/tools/index.html.
- **IDSE Factsheets** – Three factsheets that summarize the four options systems may use to comply with the IDSE requirements. The factsheets are:
  - Stage 2 DBPR IDSE Standard Monitoring Factsheet
  - Stage 2 DBPR IDSE System Specific Study Factsheet
  - Stage 2 DBPR IDSE 40/30 Certification and Very Small System Waiver Factsheet

Other Stage 2 DBPR Guidance Materials

For additional guidance on implementing the Stage 2 DBPR, you may refer to the following guidance material located at: www.epa.gov/safewater/disinfection/stage2/compliance.html.

- Draft Simultaneous Compliance Guidance Manual

Your state may have state-specific materials to assist you in complying with the Stage 2 DBPR.

How to get copies of EPA guidance materials

To obtain copies of the materials listed above you can:

- Download from EPA's Website: www.epa.gov/safewater/disinfection/stage2/compliance.html.
- Call the Safe Drinking Water Hotline at 1-800-426-4791
- Call the National Service Center for Environmental Publications at 1-800-490-9198 or visit their Web site at www.epa.gov/ncepihom.

To determine if your state drinking water agency or EPA is implementing the Stage 2 DBPR you may contact the Safe Drinking Water Hotline, or visit the Stage 2 DBPR website at www.epa.gov/safewater/disinfection/stage2/compliance.html.

Training Opportunities

EPA will present webcasts on the LT2ESWTR and Stage 2 DBPR and Compliance Assistance Tools for Water Systems.

These webcasts will be open to system operators and regulators. Registration information maybe found on the Drinking Water Academy website at www.epa.gov/OGWDW/dwa/calendar.html.

In addition to notifying systems of their requirements, states may also want to consider providing written notice to a system regarding the status of their Stage 2 DBPR submitted compliance documents. Templates for these letters can be found in Appendix F. Written notification should include:

- Summary of the issue.
- Appropriate contact if questions arise.
- Fact sheet or other summary materials (optional).

Factsheets and others materials can be found on EPA's Stage 2 DBPR Web site at www.epa.gov/safewater/disinfection/stage2.

Slide Presentation

For some, written communication alone will not result in full comprehension of the Stage 2 DBPR requirements. Slide presentations can be used by state staff and other training providers to present the background of the rule, its benefits, and rule requirements.

EPA developed a "Train the Trainer" program, Webcasts, and in-person training sessions to assist with implementation of the Stage 2 DBPR. Materials used for the training sessions are available on EPA's Web site at www.epa.gov/safewater/disinfection/training.html.

The EPA Drinking Water Academy (DWA) expects to develop a training session on the Stage 2 DBPR (available in Microsoft's PowerPoint format). Copies of the presentation may be used to train other state personnel, technical assistance providers, water system personnel, and the public. EPA's DWA slides will be available electronically by accessing EPA's Web Site at www.epa.gov/safewater/dwa.html.

Guidance Documents and Seminars

Technical guidance documents developed for the Stage 2 DBPR are useful for explaining rule requirements and specific aspects of rule implementation to system operators. These aspects include conducting IDSEs and calculating LRAA for MCL compliance. The guidance documents can be used as stand-alone references or as supporting materials in Stage 2 DBPR-related training events. See section 2 of this manual for more information on these references.

3.4 Update Data Management Systems

Although state data management systems vary to suit state-specific requirements and needs, EPA recommends that all states ensure that their data management systems are capable of efficiently tracking affected water systems compliance status and other information needed to implement this rule. States using Safe Drinking Water Information System (SDWIS) should review information on the Information Processing and Management Center (IPMC), available on EPA's Web site at www.epa.gov/safewater/disinfection/stage2.

The IPMC is a centrally located receiving, processing, and mailing facility designed to facilitate coordination between EPA and states during LT2ESWTR and Stage 2 DBPR early implementation and to manage the workload. An integral part of the IPMC is the Data Collection and Tracking System (DCTS)—a Web-based data management system that allows EPA and states to access and track IDSE submissions. Although the database design is independent of SDWIS/State, DCTS is built to easily integrate with EPA's Office of Water's systems, including SDWIS.

Some of the services provided by the IPMC include:

- Tracking receipt of PWS submissions, follow up conversations with PWSs, and approval decisions, and store all related records.
- Reviewing submissions for required components and categorize according to level of complexity for final review by state/EPA.
- Generating reports, including a report of PWSs who have missed their compliance deadline.
- Mailing notifications to systems.

Systems should also be able to submit data for the IDSE to EPA or the state through the IPMC. EPA or the state should make systems aware of this method to submit data when corresponding with them regarding their IDSE option. For sample language, review the letters presented in Appendix F.

3.5 Address Issues for Consecutive and Wholesale Systems

This special primacy requirement is further discussed in section 4.4 of this guidance.

Under §141.29, states can use their authority to modify a system's compliance monitoring requirements by considering a combined distribution system as one system. Section 142.16(m) indicates that states can use this authority to modify wholesale and consecutive systems' compliance monitoring requirements, but cannot modify IDSE requirements. Every system has to comply separately for the IDSE, including monitoring and preparing an IDSE Report (if required) based on their own system's requirements.

If the state modifies two or more systems' monitoring requirements using this authority, each system's monitoring plan will reflect these modifications. In addition, the Stage 2 DBPR requires that each plan be accompanied by the Compliance Monitoring Plans of all the other systems in their combined distribution system. States may consider encouraging systems in the same distribution system to send their Compliance Monitoring Plans in together, rather than each system sending copies of others systems' plans.

Section 142.16(m) further states that the state must describe how they intend to implement this authority in their application for primacy. States must have a plan for how they will implement the modifications and ensure that each individual system has at least one compliance monitoring site.

Example: *A group of three systems each serve a population of 20,000. Based on the Stage 2 DBPR requirements, each system would need 4 compliance monitoring sites for a total of 12. If the state considers them as one system, the system would serve 60,000 people and the total number of sites would be 8 instead of 12. The state can have the systems distribute the 8 samples across the three systems as they see fit, as long as there is at least one site in each of the three systems (i.e., no system can be void of a monitoring site).*

Also, if a wholesale system has DBP issues, it is likely to focus on precursor removal. This option is not available to consecutive systems that receive treated water. Treated water may contain high DBPs as well as high levels of precursors and disinfectants. Therefore, the Stage 2 DBPR introduces the following best available technology (BAT) for consecutive systems, which are not focused on precursor removal:

- Systems serving at least 10,000 people: Chloramination and management of hydraulic flow and storage to minimize residence time in the distribution system.

- Systems serving fewer than 10,000 people: Management of distribution system and storage.

3.5.1 Reviewing Plans and Reports from Wholesale and Consecutive Systems

As EPA or the state reviews Standard Monitoring Plans, SSS Plans, and IDSE Reports, they will need to consider some issues that are particular to consecutive and wholesale systems in a combined distribution system. The Stage 2 DBPR was written to require that systems within a combined distribution system complete each requirement under the IDSE under the same schedule. This not only allows for systems to work together in preparation of their plans, monitoring, and reports, but it also allows for EPA or the state to review these plans and reports at the same time.

EPA encourages consecutive and wholesale systems to share their Standard Monitoring Plan, SSS Plan, and IDSE Reports with each other. In particular, EPA or the state should encourage consecutive systems to contact their wholesale provider as soon as possible to determine what plans, if any, the wholesale system has already made regarding the IDSE. Consecutive systems may also want to check with their wholesale system to determine whether the wholesaler has conducted monitoring in the consecutive system's distribution system. If this is the case, the consecutive systems may be able to use this information, particularly if a consecutive system wants to qualify for a VSS Waiver or a 40/30 Certification.

It is also recommended that consecutive and wholesale systems coordinate their IDSE and Stage 2 DBPR monitoring schedules to conduct monitoring at approximately the same time, though EPA recognizes that some groups of systems may not be able to monitor together due to the peak month monitoring requirement. Monitoring on concurrent schedules may allow consecutive systems to better understand the causes of high DBP levels in their distribution systems and for wholesalers to understand the impacts of treatment decisions. EPA or the state may want to recommend alternative monitoring dates to a consecutive system and its wholesaler if the systems have not coordinated their monitoring schedules.

Some issues EPA and states may want to consider when reviewing plans and reports from combined distribution systems are:

- When and at what rate is water transferred to the consecutive system? This can help systems understand when, where, how often, and how much new water enters the distribution system. This information, in turn, can help systems understand where and when water has the longest residence times.

- What is the water age prior to the entry point? This can help systems identify when disinfectants will be consumed and residual levels will drop.

- Did the consecutive system and wholesale system sample during the same peak historic month? Consecutive and wholesale systems should sample during their peak historical month for TTHMs and HAA5s, which is often the month of warmest water temperature. Generally, this will be the same month for both the wholesaler and consecutive system, which will allow for comparison of

data. However if the systems did not sample in the same peak historic month comparison of data may be difficult.

EPA and states should also examine the maps of both systems at the same time to determine if the systems, when considered collectively, have addressed all key DBP issues and located monitoring in as many key sites as possible.

As discussed in section 3.2.3, some states may have combined distribution systems that, because of system contracts or agreements, are treated as one system for compliance with monitoring requirements. EPA or the state may continue to allow such systems to be regulated under these conditions for Stage 2 DBPR compliance monitoring. However, the systems cannot conduct one IDSE for the entire combined distribution system. Each of the consecutive and wholesale systems must conduct its own IDSE (plan and report), with each system selecting the required number of monitoring sites for its individual system size and source type. Any reduction in sampling sites will be negotiated with EPA or the state during the Stage 2 DBPR Compliance Monitoring Plan process.

For more information on consecutive and wholesale system issues, refer to Appendix D of EPA's *IDSE Guidance Manual* or EPA's *Consecutive System Guidance Manual*.

3.6 IDSE Option: Very Small System Waiver

Systems serving fewer than 500 people that have taken TTHM and HAA5 samples automatically receive the VSS Waiver, unless notified otherwise by EPA or the state that they must conduct an IDSE [§141.604]. To qualify for the VSS Waiver, systems can use Stage 1 DBPR compliance data (including reduced monitoring data) or operational TTHM and HAA5 data, if the sampling and analysis met the general intent of Stage 1 DBPR compliance. Under the Stage 1 DBPR, samples must be taken and analyzed by EPA approved methods, represent acceptable locations, and include the month of warmest water temperature. Consecutive systems are also eligible for the VSS Waiver if they collected data under the Stage 1 DBPR, voluntarily took DBP samples that meet the intent of the Stage 1 DBPR, or if the wholesale system sampled within the consecutive system as one of its Stage 1 DBPR sites.

Systems do not have to apply for the waiver, and the state does not have to approve the waiver in order for a system to take advantage of this IDSE option. Also, monitoring results used to receive the waiver do not have to be below any particular level. Systems that qualify for the VSS Waiver have no further IDSE requirements, but must complete a Compliance Monitoring Plan to identify their Stage 2 DBPR compliance monitoring sites.

EPA or the state can require a small system to conduct standard monitoring or an SSS, regardless of its eligibility for the VSS Waiver, and for any reason. States may wish to conduct special technical assistance or training efforts to help the VSSs asked to conduct an IDSE.

3.6.1 Review Considerations for the VSS Waiver

Some of the criteria that EPA and states might use to evaluate the operational TTHM and HAA5 data to determine if a system qualifies for the VSS Waiver are presented below.

- Were samples analyzed by approved methods?
- Were samples analyzed at a certified laboratory?
- Are the sites located appropriately (average and maximum residence time)?
- Were samples taken during the month of warmest water temperature (*if the data are available)*?

Although EPA and states have the discretion to require VSSs to conduct either standard monitoring or an SSS, they should notify the system in writing. EPA and states may want to exercise this authority when one or a combination of more than one of the following conditions exists:

- *Branched Distribution System*. Some small rural systems, despite serving a small population, may have long, branched, or poorly looped distribution lines.

- *Inexperienced System Operator*. If EPA or the state is aware that a system operator is inexperienced with distribution system operations or DBP monitoring, they may decide it is interest of public health that the operator prepare a Standard Monitoring Plan in accordance with the IDSE requirements.

- *High DBP Levels*. States may want to review a system's files (particularly for surface water systems and ground water systems with high influent TOC levels) to see if the system's compliance data indicate high levels of DBPs. If individual measurements are within 10 percent of the MCL concentrations (10 percent of the MCL is 0.072 mg/L for TTHM and 0.054 mg/L for HAA5), the state may want to require the system to conduct standard monitoring.

- *Difficulty Maintaining Disinfectant Residual*. If a system has difficulty maintaining a disinfectant residual in its distribution system, the state may want to require the system to conduct standard monitoring or an SSS to identify their high HAA5 site.

- *Stage 1 DBPR Sites Not Representative.* If monitoring sites under the Stage 1 DBPR are not representative of the highest TTHM and HAA5 concentrations, the state may want to require the system to conduct standard monitoring or an SSS to identify more representative sites.

In these examples, EPA or the state may notice something specific about the distribution system or historical data that convinces them that the system should conduct standard monitoring. In such instances, the reviewer may want to suggest specific locations where the system should consider monitoring for the IDSE.

If EPA or a state determines that a system should conduct standard monitoring, this should be communicated to the system as early as possible. If it is early enough, the system may be able to comply within their original schedule. However, if the system is not notified in time to complete a Standard Monitoring or SSS Plan by the scheduled compliance date, the state should work with the system to set an alternate schedule. The alternate schedule could be based on one of the four regulatory schedules or it could be a schedule unique to that system. The IPMC is set up to accommodate alternative IDSE schedules.

For systems that serve fewer than 500 people, standard monitoring will consist of one round of sampling (during peak historic month) at two locations. The first location will be at the high TTHM site. If they are a consecutive system, the second site will be near the entry point. If they are not a consecutive system, the second site will be at the high HAA5 site. Preparation of a Standard Monitoring Plan, completion of the monitoring, and preparation of an IDSE Report will not be a significant burden on these systems, and will provide them with useful information. VSSs that must complete standard monitoring will find EPA's *IDSE Guide for Systems Serving <10,000* helpful for understanding their requirements.

3.6.2 Stage 2 DBPR Compliance Monitoring Plan for VSS Waiver Systems

Systems that qualify for the VSS Waiver will not submit an IDSE Report, but will need to submit a Stage 2 DBPR Compliance Monitoring Plan. The Stage 2 DBPR requires systems of this size to monitor for

TTHM only at their high TTHM site and for HAA5 only at their high HAA5 site. These systems do not have to take dual sample sets.

Systems that serve fewer than 500 people are likely to have small, straight-forward distribution systems. For most systems with compact or small distribution systems, the high TTHM and HAA5 concentrations (based on their DBP data) will likely occur at the same site. In this case, the system can use one site for both high TTHM and HAA5.

3.7 IDSE Option: 40/30 Certification Alternative

Systems demonstrating low historic TTHM and HAA5 distribution system concentrations in accordance with the Stage 1 DBPR requirements may qualify for the 40/30 Certification. Systems receiving this certification are not required to conduct standard monitoring or an SSS, but are still required to comply with Stage 2 DBPR compliance monitoring requirements. Systems must meet the following criteria to qualify for the 40/30 Certification [§141.603]:

- All individual samples (i.e., NOT the running annual average (RAA)) collected for Stage 1 DBPR must be less than or equal to 0.040 mg/L for TTHM and less than or equal to 0.030 mg/L for HAA5 over an eight consecutive calendar quarter period, as specified in Table 3-3.

- No TTHM or HAA5 monitoring violations can occur during the same 8 quarter period.

- All monitoring data must have been analyzed by approved methods at a certified laboratory (per Stage 1 DBPR compliance monitoring requirements).

Some states may allow systems that were not required to comply with Stage 1 DBPR to use operational data to support a 40/30 Certification, including data collected by a wholesale system. If the state is considering allowing this data to be used, they should clarify to the system that the samples should meet the general intent of Stage 1 DBPR compliance.

Systems that sample less frequently than annually (ground water systems that served fewer than 10,000 people and are on reduced TTHM and HAA5 monitoring under Stage 1 DBPR) may not have data for the 8 consecutive quarters specified in the Stage 2 DBPR. These systems are still eligible for a 40/30 Certification. They will base their certification on Stage 1 DBPR compliance samples taken during the 12 months prior to the date specified in the Stage 2 DBPR (see Table 3-3).

Consecutive systems are eligible for the 40/30 Certification if they collected data under the Stage 1 DBPR, voluntarily took DBP samples that meet the intent of the Stage 1 DBPR, or if the wholesale system sampled the consecutive system as one of its Stage 1 DBPR sites. Consecutive systems are most likely to use operational data to qualify for the 40/30 Certification.

Even if the system qualifies for the 40/30 Certification criteria, EPA or the state can require a system to perform an IDSE. Systems that do not qualify for one of the above exemptions must perform an IDSE. These systems have two options, described in sections 3.8 and 3.11.

Table 3-3. Compliance Monitoring Data Requirements for the 40/30 Certification

If your 40/30 Certification is due	Then your eligibility for 40/30 Certification is based on eight consecutive calendar quarters of Subpart L compliance monitoring results beginning no earlier than[1]
(1) October 1, 2006.	January 2004.
(2) April 1, 2006.	January 2004.
(3) October 1, 2007.	January 2005.
(4) April 1, 2007.	January 2005.

1. Unless you are on reduced monitoring under Stage 1 DBPR and were not required to monitor during the specified period. If you did not monitor during the specified period, you must base your eligibility on compliance samples taken during the 12 months preceding the specified period.

3.7.1 Requirements for the 40/30 Certification

The system is required to submit a statement to EPA or the state certifying that the eligibility criteria listed in section 3.7 were met. A sample 40/30 Certification letter is shown in Example 3-2. Once a system submits its certification, they have completed their IDSE requirements, unless a system is contacted by EPA or the state and told to conduct standard monitoring or an SSS.

Example 3-2. Example 40/30 Certification Letter

System Information
PWS Name_____ PWS ID:_____
Street Address:_____ City, State, Zip:_____
Population Served:_____ Source Water Type: ☐ Ground ☐ Surface/GWUDI
System Type: ☐ CWS ☐ NTNCWS
Combined Distribution System: ☐ Wholesale ☐ Consecutive ☐ Neither
Contact Person
Name: _____Title: _____
Phone Number:_____Fax Number (if available):_____
Email Address (if available):_____
Certification
I hereby certify that each individual Stage 1 DBPR compliance sample collected from _____ to _____ were less than or equal to 0.040 mg/L for TTHM and 0.030 mg/L for HAA5. I understand that to be eligible, each individual sample must be below these values. I also certify that this PWS did not have any monitoring violations during this time period.
Signature:_____ Date:_____

The Stage 2 DBPR IDSE requirements also include a provision that allows EPA and states to require the system to submit information in addition to its certification letter, namely:

- Stage 1 DBPR compliance monitoring results, including sample location and date.
- A distribution system schematic.
- Recommended Stage 2 DBPR compliance monitoring locations.

EPA and states can require systems to submit the information above on an individual basis after receiving their certification, or they may want all systems state-wide to submit the information along with their certification. When deciding whether to ask for some or all of this information, EPA and states may want to consider whether the system is using operational data to qualify for the certification, if there are any known Stage 1 DBPR compliance issues for the system, and whether the system appears to be prepared for Stage 2 DBPR compliance monitoring.

States should communicate their requests for additional information to EPA as soon as possible so that the systems can respond to any requests for additional information.

Although systems that have an approved 40/30 Certification are not required to submit an IDSE Report, they must include their Stage 2 DBPR compliance monitoring recommendations in their Stage 2 DBPR Compliance Monitoring Plan, unless the state requests site recommendations as part of the 40/30 Certification.

3.7.2 Review Considerations for the 40/30 Certification

The purpose of the EPA or state review of 40/30 Certifications is to verify that the certification meets the deadline and minimum criteria, decide if more information is necessary, and decide if the system should conduct standard monitoring or an SSS instead of receiving the 40/30 Certification.

If EPA or the state finds that the certification is acceptable, it is recommended that a formal approval letter is sent so the system knows they have met all of their IDSE requirements.

If EPA or the state finds that the certification if acceptable, no formal approval letter is required. If the system does not hear from EPA or the state, they can assume the certification was accepted and consider their IDSE compliance complete.

EPA or the state should consider the following questions when deciding whether a system qualifies for a 40/30 Certification based on operational data:

- Were samples taken and analyzed by approved methods at a certified lab?
- Were there an adequate number of sample sites for the system size? Based on the system size, did they take approximately as many samples as they would have under Stage 1 DBPR? Is there enough data to select Stage 2 DBPR sites?
- Were the samples taken at appropriate locations? Some or all of the sample sites should have been located at sites with maximum residence time, as required under Stage 1 DBPR. If all sites are near the entry point, this is not sufficient to justify 40/30 Certification.
- Were samples taken during the month of warmest water temperature for each year of operational data used to qualify?
- Were samples taken at the appropriate frequency? Based on population served, disinfectant type and source type, were samples taken on a monthly, quarterly or annual basis (as they would have been required to do under Stage 1 DBPR)?

Before approving a system's 40/30 Certification, EPA or the state may also want to consider the system's type (i.e., CWS, NTNCWS), the population served by the systems, and whether the system is part of a combined distribution system.

Some reasons why EPA or the state may require a system that is eligible for a 40/30 Certification to conduct standard monitoring or an SSS include the following:

- *Validity of Certification*. EPA or the state should review the certification and consult the system's records (if available) to verify that the system's certification is valid. Each of the following situations would constitute an invalid 40/30 Certification and would require that the reviewer deny the certification.

  – *DBP Samples Above 40/30*. If the state's records indicate that the system's TTHM or HAA5 compliance sample results for the eligibility period were greater than 0.040 mg/L and 0.030 mg/L, respectively, the certification is invalid.

  – *Individual Samples*. If the system based their 40/30 Certification on the running annual average or the locational running annual average rather than each individual sample, the certification is invalid.

  – *Violations*. If the system has experienced any Stage 1 DBPR TTHM or HAA5 monitoring violations during the eligibility period, the certification is invalid.

  – *Compliance Data*. If the system has Stage 1 DBPR compliance data but are basing their 40/30 Certification on operational data rather than compliance data, the certification could be invalid.

- *Stage 1 DBPR Sites Inadequate or Not Representative*. If the number of Stage 1 DBPR monitoring sites is significantly lower than the number of Stage 2 DBPR sites that will be required, EPA or the state may determine that the system does not have enough data to justify the 40/30 Certification. Similarly, if the Stage 1 DBPR sites were poorly placed, such that the Stage 1 DBPR data does not reflect the entire distribution system, EPA or the state may determine that the data are not appropriate to justify a 40/30 Certification. The reviewer may also want to consider in which months the system's Stage 1 DBPR sampling took place. If a system's data do not represent the months that EPA or the state considers to have the highest potential for DBP formation, standard monitoring or an SSS may be warranted.

  – *Large Population and Few Plants*. If a system has a large population, but few treatment plants, there may have been very few Stage 1 DBPR sites required. The system may need to select many Stage 2 DBPR sites. In this case, EPA or the state may decide that standard monitoring or an SSS should be conducted in order to obtain enough information to select appropriate Stage 2 DBPR sites.

  – *Consecutive system*. If a state allocated a wholesale system's Stage 1 DBPR sample sites across the wholesale and consecutive systems, the consecutive system may have some limited Stage 1 DBPR data, but EPA or the state may determine that it is not adequate to represent the entire distribution system and justify the 40/30 Certification.

- *Other DBP Data*. If EPA or the state is aware of operational DBP data that indicates higher levels in the distribution system, or if compliance data outside the 2-year compliance period were significantly higher, they may want to request additional information and/or require standard monitoring or an SSS.

- *Eligibility Period Not Representative*. If EPA or the state believes that the low DBP levels experienced during the 2-year eligibility period that the system is relying upon for its 40/30 Certification are not a good indication of the levels the system is currently experiencing, they may want to consider requiring standard monitoring or an SSS.

  – *Natural Circumstances*. If a system's 2-year eligibility period spanned a period of time in which natural circumstances may have favored lower DBP levels in the distribution system, EPA or the state may want to consider requiring standard monitoring or an SSS. Such circumstances may include cooler temperatures or better source water quality. As an example, a system with multiple sources may typically be required to rely on a poorer quality source during high demand. If during the eligibility period the higher quality source was sufficient, the system's DBP levels may have been particularly low during that period.

  – *Distribution System Changes*. If a system has recently made or is in the process of making distribution system changes that could affect DBP formation, EPA or the state may want to require it to conduct standard monitoring or an SSS. Such changes may include the expansion of the distribution system, annexation of a new area, connection of a new subdivision, consolidation with another small water system, or construction of a new storage tank.

  – *Disinfection or Other Treatment Changes*. Most treatment plant changes will not affect water age or relative levels of DBPs in the distribution system. However, if a system has recently made, or is in the process of making changes to its disinfection practices or other treatment changes that may impact DBP formation, the reviewer may want to consider requiring standard monitoring or an SSS. These changes may include the addition of booster chlorination in the distribution system, a change in disinfectant type, or a change in the location of the disinfectant application.

  – *Source Changes*. If a system has recently made or is in the process of making changes to its sources, such as a change from ground to surface source, adding or removing a source, or making other major changes, EPA or the state may want to determine if these changes would impact DBP formation and warrant standard monitoring or an SSS.

Depending on the eligibility period upon which a system is basing their certification, they may be sampling immediately before the certification deadline. The system will not know whether they have met the eligibility criteria for 40/30 Certification until the last samples collected during the eligibility period are analyzed. If the DBP levels exceed the 40/30 threshold near the end of the period, they must conduct an IDSE through standard monitoring or an SSS. Since the deadlines for submittal of a Standard Monitoring Plan or an SSS Plan are the same as the 40/30 Certification deadline shown in Table 3-3, the system will have very little time to then prepare a Standard Monitoring or SSS Plan.

Similarly, if EPA or the state reviews the certification and determines that the system should conduct standard monitoring or an SSS, the deadline for submitting a Standard Monitoring or SSS Plan will likely have passed. The deadline for submitting a 40/30 Certification is the same as for submitting Standard Monitoring and SSS Plans. If the reviewer intends to require standard monitoring or an SSS, it is best to notify the system as early as possible. If the system is contacted early enough, it may be able to comply within the original schedule. However, if the system is not notified in time to complete a Standard Monitoring or SSS Plan by the scheduled compliance date, EPA or the state should work with the system to set an alternate schedule. The alternate schedule could be based on one of the four regulatory schedules or it could be a schedule unique to that system.

3.7.3 Stage 2 Compliance Monitoring Plan for 40/30 Certification Systems

Systems that qualify for the 40/30 Certification will not submit an IDSE Report, but will need to submit a Stage 2 Compliance Monitoring Plan. Although many systems will be able to use their Stage 1 DBPR sites for Stage 2 DBPR compliance monitoring, some systems (e.g., systems with relatively large populations and few plants) may need to identify additional sites. For these systems, the site choice should be similar to site selection for standard monitoring, described in section 3.11.2.2. In general, systems will need to consider their distribution system map, operational data, and water quality data to identify the best sites.

3.8 IDSE Option: System Specific Study

Systems can meet IDSE requirements using an SSS if their existing data or hydraulic modeling data meet certain requirements for an SSS [§141.602]. Some systems have detailed knowledge of their distribution systems by way of ongoing hydraulic modeling and/or existing widespread monitoring, which provides equivalent or superior monitoring site selection information compared to standard monitoring. Therefore, under this alternative, these systems may choose to perform an SSS in lieu of standard monitoring.

Systems may rely on one of two data sources when preparing their study. They may use TTHM and HAA5 monitoring data if each location has been sampled once during the peak historical month for TTHM or HAA5 levels or during the month of warmest water temperature. These samples must be collected and analyzed in accordance with the Stage 1 DBPR requirements [§141.131], and must be collected no earlier than 5 years prior to the study plan submission deadline. (The number of monitoring locations and samples required are outlined in Table 3-5.)

Alternatively, systems may use extended period simulation hydraulic models that simulate water age in the distribution system. The model must simulate variation in demand over 24 hours and show a consistently repeating 24-hour pattern of residence time. EPA's *IDSE Guidance Manual* provides additional information on conducting SSSs and determining whether system specific data could be sufficient to meet the IDSE requirements.

Systems conducting an SSS must submit an SSS Plan and an IDSE Report to EPA or the state. Systems also have the option to submit an IDSE Report at the same time as their study plan if they believe they have the necessary information by the time the study plan is due.

3.9 IDSE Option: Existing Monitoring System Specific Study

3.9.1 Review of Existing Monitoring SSS Plan

This section contains guidance on four different categories of reviews that can be completed for study plans based on existing monitoring results:

- Review for required plan elements.
- Review for correct interpretation of the IDSE requirements.
- Technical review of data representativeness.
- Technical review of monitoring results.

The first review for required plan elements will be done by the IPMC for EPA reviewers and states that choose to use it. The remaining reviews for correct interpretation of the IDSE requirements, technical

review of data representativeness, and technical review of standard monitoring site selection, will be completed by either the state or EPA.

Chapter 5 of EPA's *IDSE Guidance Manual* has in-depth information regarding how a system may prepare an SSS Plan using existing monitoring results.

The state or EPA may want to request additional information from a system during the review process. The state or EPA can approve the plan, request that the system modify its plan, or require standard monitoring if the plan is not acceptable. If a system does not respond to a request to modify the plan or to provide more information, the state or EPA has the option of requiring standard monitoring. EPA or the state has 12 months after the submission deadline to complete the review of Standard Monitoring Plans. All correspondence between the system and the reviewer is included in the 12-month period and does not extend the ultimate approval deadline. If EPA or the state does not contact the system to officially approve or request modifications to the plan by the end of the review period, the system can consider the plan approved and will implement it as submitted.

If the state or EPA intends to require standard monitoring, it is best to notify the system as early as possible. If it is early enough, the system may be able to comply within their original schedule. However, if the system is not notified in time to complete a Standard Monitoring Plan by the scheduled compliance date, EPA or the state should work with the system to set an alternate schedule. The alternate schedule could be based on one of the four regulatory schedules or it could be a schedule unique to that system. The IPMC is set up to accommodate alternate schedules.

The state or EPA should notify the system in writing when its plan is approved. If changes were made after the original submission, the state or EPA should send a copy of the approved plan to the system for its records or reference the changes in a letter to clarify which version of the plan is approved. If EPA is reviewing plans all correspondence and recordkeeping will be through the IPMC.

An SSS based on existing monitoring data results will be similar to the Standard Monitoring Plan, and many states will have the expertise to review these plans. EPA Headquarters will provide support to EPA Regions and states that require technical assistance in reviewing SSS Plans.

EPA or the state should review each plan early in the review period to ensure that it contains the minimum elements required by the Stage 2 DBPR.

3.9.1.1 Review of Required Elements for Existing Monitoring SSS Plan

Tables 3-4 and 3-5 can be used to determine if the system has met the minimum requirements of the Stage 2 DBPR for existing monitoring results study plans. Systems have the option of using the Existing Monitoring Results Plan Form (Form 2) in Appendix E of this document. If systems fill out all sections of the form according to the instructions, they have met the minimum requirements of the rule. Note that Form 2 asks the system to list its IDSE schedule and the number of monitoring sites and samples required for the system. If the system uses Form 2, verify that the following information provided is correct:

- *Schedule* – Verify that the schedule is consistent with the schedule in the letter sent to the system by EPA or the state or with a schedule based on additional conversations with the system. This verification can be done by checking the schedule listed for that system in the DCTS. If the submitted schedule is different, EPA or the state should contact the system to discuss the required compliance schedule.

- *Number of Locations and Samples* – Verify that the number of locations and number of samples for both TTHM and HAA5 meet the minimum requirements of the rule, as shown in Table 3-5.

  – Note that systems must meet the requirements for both the number of sites and the number of samples to qualify. EPA or the state may use the checklist in Table 3-5 to make this determination.

  – Reviewers should evaluate the distribution system schematic to confirm that the number of monitoring sites is consistent with the requirements in Table 3-5.

  – Reviewers should examine the system's data to determine if the system has collected the correct number of samples. If not, the reviewer should ensure that the system has planned enough additional monitoring to meet the criteria for the number of sites and samples. If a system misinterpreted its monitoring requirements, the reviewer should contact the system to explain what is required.

Chapter 5 of EPA's *IDSE Guidance Manual* includes many suggestions for organizing existing monitoring data. If the submission is difficult to understand, reviewers can request a revised SSS Plan.

A completed example of an SSS Plan using existing monitoring results can be found in Appendix D of EPA's *IDSE Guidance Manual*.

Table 3-4. SSS Plan Using Existing Monitoring Results, Required Elements Checklist

Check if Provided ☑	Required Element	Section in Form 2
☐	Population served by the system	I.A
☐	Source water type (Subpart H or ground water)	I.A
☐	Identification of the peak historical month for TTHM, HAA5, or warmest water temperature	III.A
☐	Previously collected monitoring results	IV
☐	Dates of any planned SSS monitoring and Stage 1 DBPR compliance monitoring sampling	VI
A distribution system schematic with:		VII
☐	All distribution entry points	
☐	All sources	
☐	All storage facilities	
☐	Locations of all completed or planned SSS monitoring	
☐	Locations of Stage 1 DBPR compliance samples	
Certification that:		
☐	All compliance and non-compliance data during the time period beginning with the first reported result and ending with the most recent Stage 1 DBPR result are included	V
☐	The distribution system and treatment have not significantly changed during period of SSS data	
☐	Samples are representative of the entire distribution system	

Table 3-5. Minimum Requirements Checklist for Existing Monitoring Results Study Plan

Yes	No	
☐	☐	Were all samples collected and analyzed in accordance with an approved EPA method and by a certified laboratory?
☐	☐	Were all sample results collected no earlier than 5 years prior to the system's study plan submission deadline?
☐	☐	Does the system have at least the minimum number of distribution system monitoring locations shown in the table below from which the system collected TTHM and HAA5 samples?
☐	☐	Does the system have at least the minimum number of TTHM samples and HAA5 samples shown in the table below?
☐	☐	Was each monitoring location sampled once during the month of highest TTHM or highest temperature for every 12 months of data submitted?
☐	☐	Have the distribution system and treatment not changed significantly since samples were collected?
☐	☐	Are existing monitoring locations representative of the entire distribution system?

If the system answered yes to all of the above questions, the system meets EPA's minimum requirements for an SSS using existing data. Remember, though, that EPA or the state can still require systems to conduct standard monitoring, even if they meet the minimum requirements.

Source Water Type	System Size Category (Population Served)	Minimum Number of Monitoring Locations*	Minimum Number of Samples	
			TTHM	HAA5
Subpart H	<500	3	3	3
	500-3,300	3	9	9
	3,301-9,999	6	36	36
	10,000-49,999	12	72	72
	50,000-249,999	24	144	144
	250,000-999,999	36	216	216
	1,000,000-4,999,999	48	288	288
	≥ 5,000,000	60	360	360
Ground Water	<500	3	3	3
	500-9,999	3	9	9
	10,000-99,999	12	48	48
	100,000-499,999	18	72	72
	≥ 500,000	24	96	96

*Can include Stage 1 DBPR sites

The peak historical month for existing monitoring results should be based on TTHM, HAA5, and/or warmest temperature. EPA or the state may generally follow the criteria for reviewing peak historical month provided in Section 3.11.1.4. They should ensure that the system has collected samples at least once during the peak month for each 12-month period of data submitted. If a system did not sample during the peak historical month during a year, that year of data does not count towards their minimum requirements. If the system has planned any additional SSS monitoring, the reviewer should also verify that it will collect at least one round of samples during the peak historical month.

Submissions to the IPMC will not be considered confidential business information (CBI) and are subject to the Freedom of Information Act (FOIA).

If the requirements were not correctly interpreted, EPA or the state should contact the system for more information. If some of the required elements on the checklists in Tables 3-4 and 3-5 are missing, EPA or the state should contact the system to request the missing information. Until all required elements are submitted, the plan should be considered incomplete and should not be reviewed further. If all boxes are checked, all required elements have been submitted.

3.9.1.2 Technical Review of Existing Monitoring SSS Plans

EPA or the state should use the system's distribution system schematic to ensure that the sites selected represent the entire distribution system. EPA or the state should consider the criteria below in making this determination.

Geographic representation: The distribution system schematic should allow the reviewer to ascertain if the sites monitored give good geographic representation of the distribution system. If a significant portion of the distribution system is excluded from the existing monitoring results, the reviewer should request the system to sample at additional sites in the areas that are not represented.

Hydraulic representation: EPA or the state should check to see if all pressure zones are represented and that sites address areas that are hydraulically remote. If this information is not provided on the distribution system schematic, reviewers may contact systems to obtain it through a phone conversation.

Key sites in the distribution system: If at all possible, systems should have tried to include most key trouble areas including long dead end lines (keeping the site prior to the last customer), areas down gradient of storage tanks, areas with low residual chlorine levels, and areas influenced by booster chlorination (depending on the water chemistry and age).

If the reviewer determines that sites are not representative, they should contact the system and request more information. If EPA or the state determines, based on the new information, that the sites are appropriate, they can attach the information to the study plan and complete the review. However, if the system is unable to provide adequate justification, EPA or the state should work with the system to select sites for additional SSS monitoring or require standard monitoring. If the system does not respond to EPA's or the state's request for information or does not make any requested modifications, the reviewer can require standard monitoring.

The Stage 2 DBPR IDSE requirements allow EPA or the state to reject some of a system's data and require that system to replace the rejected data with additional SSS monitoring or to conduct standard monitoring. If EPA or the state question the data submitted, they should request more information from the system to determine if the data can be adequately justified. Some reasons why EPA or the state may consider rejecting a portion of a system's data are described below.

Use of Unapproved Methods for Sample Analysis: Systems may only use samples analyzed by a certified laboratory using approved methods. Any data not meeting this requirement do not count toward the minimum number of samples and locations.

Failure to Fully Represent Distribution System: The sampling sites for the IDSE must represent TTHM and HAA5 concentrations throughout the distribution system. If any significant areas of the distribution system are not represented with sample sites, EPA or the state should require the system to collect additional data in those areas or to conduct standard monitoring.

Unusual Events: EPA or the state may want to reject any data from short periods of unusual (not routine seasonal) system conditions that are not representative of typical operating conditions. Some examples include:

- Main breaks during or just before sample collection that cause a shift in the flow patterns in the distribution system.
- Treatment equipment failures or power failures that had a significant impact on DBP levels in the distribution system.
- Unusual periods of drought that reduced runoff and changed TOC loading of surface water sources only during a single year.

Note that this list is not all-inclusive—EPA or the state should use best professional judgment to determine if a temporary event should be considered unusual.

Permanent, Significant Treatment Changes: If any significant permanent treatment process or source changes took place during the period for which the system submitted existing monitoring results, EPA or the state may want to consider rejecting any data collected before that change took place. Treatment changes that affected the magnitude of TTHM and HAA5 levels in the distribution system, but that are unlikely to have changed the DBP formation rate and relative levels of TTHMs and HAA5s in different parts of the system, are acceptable. For example, improved control of an existing coagulation process or minor changes in coagulation pH that reduce average levels of DBP precursors are acceptable.

If treatment process or source changes have occurred and data collected prior to the change are utilized in an SSS, then the use of the data should have been justified. An explanation of the change and a demonstration that the change is unlikely to have significantly affected the relative TTHM and HAA5 levels in the distribution system should have been provided. Specific examples of these types of changes are shown in Table 3-6.

Permanent, Significant Distribution System Changes: If any significant distribution system changes took place during the period for which the system submitted existing monitoring results, EPA or the state should use their best professional judgment to determine if the modification to the distribution system would warrant EPA or the state rejecting any data collected before that change took place. Supply points, pressure zones, large transmission mains, pump stations, storage tanks, and large wholesale and retail

customers should generally be consistent throughout the data collection period for the SSS. Although this list is not all-inclusive, some examples are:

- Major, permanent changes in plant production rates, installation or removal of high service or booster pump stations, or pump operation schemes that significantly change the location of influence zones of treatment plants and mixing zones within the distribution system.

- Major, permanent changes in water use patterns or system hydraulics.

Specific examples of these types of changes are shown in Table 3-6.

Table 3-6. Examples of Treatment, Distribution System, and Source Changes

Temporary Changes that Are Not Likely to Significantly Impact DBP Formation	Permanent Changes that Warrant Exclusion of Using Existing Data

• Regular maintenance, rehabilitation, and upgrades of plant processes
• Short duration switches to free chlorine for secondary disinfection:
  • To control nitrification in a chloraminated system
  • For short duration emergencies
  • For special disinfection operations
	• Adding booster chlorination in the distribution system
	• Addition of a new water source
	• Addition or removal of a very high water use customer (industrial, institutional, or wholesale)
	• Addition, deletion, or replacement of mains or storage tanks that significantly change water flow patterns
	• Large main looping projects that significantly change water flow patterns

Note: This list is not comprehensive—EPA or the state should use best professional judgment to determine if a modification to a system's treatment or distribution system should warrant exclusion of the use of existing monitoring results.

Systems are required to submit all data taken from the time of the first sample submitted through the most recent Stage 1 DBPR compliance samples taken. Therefore, it is possible that a subset of submitted data may not meet all requirements and do not count toward the minimum number of required locations and samples. EPA or the state should verify that systems have submitted enough qualifying data to meet the minimum requirements. EPA or the state should also look at data across the entire SSS period to make sure that older data are still representative of current water quality.

If data are not acceptable, EPA or the state should work with the system to develop a plan to collect additional data during the IDSE to meet the minimum requirements. If the system has extensive data problems, EPA or the state may want to consider requiring standard monitoring. If all data are acceptable, the plan can be approved.

3.9.2 Review of Existing Monitoring SSS IDSE Report

All systems conducting an SSS must prepare an IDSE Report [§141.602(b)] and submit it to EPA or the state. The primary purpose of the IDSE Report is to provide EPA or the state with the system's recommendations for where and at what frequency Stage 2 DBPR compliance monitoring should be conducted. In addition, the system must provide justification for these selections. Remember, systems that

include their compliance calculations procedures in their IDSE Report in addition to their monitoring locations and dates may not need to submit a Stage 2 Compliance Monitoring Plan. When completing the IDSE Report, systems have the option of using the Existing Monitoring Results SSS IDSE Report Form (Form 3) in Appendix E.

There are two different categories of reviews that should be done for IDSE Reports from systems that conduct an SSS:

- Review of IDSE Report for required elements.
- Technical review of Stage 2 DBPR compliance monitoring site selection and schedule.

The first review will be done by the IPMC for EPA reviewers and states that choose to use it. The remaining technical review of Stage 2 DBPR compliance monitoring site selection and schedule will be done by either state or EPA reviewers.

If the reviewer has any concerns about a report during the review, they can either request modifications to the report or contact the system to ask for additional information. The reviewer may also require additional locations for Stage 2 DBPR compliance monitoring. The number and frequency of samples must comply with Table 3-17, unless EPA or the state requires additional monitoring. Systems must follow the site selection protocol in this subsection unless they provide EPA or the state with adequate justification for alternate sites.

EPA or the state has a limited amount of time after the submission deadline to request modifications or approve the IDSE Report or contact the system to let them know that the review is not complete. The EPA or state deadlines for IDSE Reports approval, modification, or notification are listed in Table 3-1.

These dates are within 3 months of the submission deadline for systems on Schedules 1, 2 and 4, and within 9 months of the submission deadline for systems on Schedule 3. Note that this is 3 or 9 months from the submission deadline, not the actual date of submission. If the system does not receive approval or modification of the report, or notification that EPA or the state has not completed their review within that 3- or 9-month period, the system may consider the report approved as submitted and use the Stage 2 DBPR compliance monitoring sites recommended in the report.

If EPA or the state needs additional time for the review, they can contact the system within the 3- or 9-month period and let them know that the review requires additional time.

3.9.2.1 Review of Required Elements for Existing Monitoring IDSE Report

The basic elements required in the IDSE Report for an SSS using existing data are listed in the checklist in Table 3-7. States may want to encourage systems to include their compliance calculation procedures in their IDSE Report so that the system may meet the requirements for submitting a Stage 2 DBPR Compliance Monitoring Plan. Systems may use the form IDSE Report for an Existing Data SSS (Form 3) in Appendix E of this document.

Table 3-7. IDSE Report for Existing Monitoring SSS Required Elements Checklist

Check if Provided ☑	Required Element	Section in Form 3
☐	Recommendations and justification of Stage 2 DBPR compliance monitoring sites	IV
☐	Proposed Stage 2 DBPR Compliance Monitoring Schedule	VI
If the IDSE Report is NOT submitted at the same time as the SSS Plan		
☐	Additional SSS and Stage 1 DBPR compliance monitoring results in a tabular or spreadsheet format	III.C & III.D
☐	Population served and source water type (Subpart H or ground water) only if they have changed since the SSS plan.	I.A
☐	Distribution system schematic only if it has changed since the SSS Plan	VII
☐	Explanation of any deviations from the approved SSS Plan	VIII

If some of the required elements on the checklist in Table 3-7 are missing, the reviewer should contact the system to request the missing information. If all boxes are checked, all required elements have been submitted.

3.9.2.2 Technical Review of Existing Monitoring IDSE Report

The purpose of the technical review of the IDSE Report is to ensure that:

- The system's recommended Stage 2 DBPR compliance monitoring locations are in accordance with the protocol set in §141.605, or
- The system provided adequate justification for alternative locations, and
- The system has chosen appropriate dates on which to sample for Stage 2 DBPR compliance.

One difference between standard monitoring and the SSS using existing monitoring results is that systems can have more than 1 year of TTHM and HAA5 data to analyze for site selection. Systems should rely on qualifying data only, and they may compare data from their peak historical month in addition to LRAAs as they work through the protocol for selecting Stage 2 DBPR compliance monitoring sites. However, they must provide a justification for relying on peak historical month data rather than LRAA data. EPA suggests that systems calculate annual averages for each site for which they have existing monitoring results and use this value to select Stage 2 DBPR compliance monitoring sites. Systems should not use data for a year in which the peak historical month was not sampled to calculate the LRAA.

Remember, systems that conduct system specific studies may be submitting their IDSE Report with their study plans.

EPA or the state should notify the system in writing when its report is approved. If changes were made after the original submission, EPA or the state should send a copy of the approved plan to the system for

its records or reference the changes in a letter to clarify which version of the report is approved. If EPA is reviewing reports, all correspondence and recordkeeping will be through the IPMC.

Stage 2 DBPR Monitoring Site Selection: A system that completes an SSS must recommend Stage 2 DBPR compliance monitoring locations using the data collected during the IDSE in addition to their Stage 1 DBPR sites. Justification must be provided for the final sites selected in the IDSE Report (including model results for water age at the relevant nodes, if a system is using modeled data). Chapter 5 of EPA's *IDSE Guidance Manual* provides a detailed discussion for Stage 2 DBPR site selection using existing monitoring results.

Systems must use the protocol in Table 3-15 to select their Stage 2 DBPR compliance monitoring sites. If a system is required to select more than eight sampling sites it must return to the top of the protocol, each time selecting from those sites that have not already been identified for Stage 2 DBPR monitoring until the required number of sites has been selected.

If a system arrives at Step 3 or Step 7 and has no more Stage 1 DBPR sites to select from, the system should skip these steps and continue with the protocol as necessary, until it has identified the required total number of monitoring locations. This may happen if the Stage 1 DBPR sites have the highest TTHM or HAA5 LRAAs and were previously selected, or if the system is a consecutive system and had little or no Stage 1 DBPR data, or if the system is very large but has few treatment plants. When this occurs, the total number of sites will be selected, but the distribution between TTHM, HAA5 and Stage 1 DBPR sites will be different than shown in Table 3-17.

EPA or the state should review the IDSE Report to assure that the system followed the site selection protocol correctly. EPA or the state should check that the system used the correct type of Stage 1 DBPR site in the third and seventh steps, depending on the system's source type.

If the system varied from the protocol in Table 3-15 it should provide a rationale for its selections. EPA or the state will use their best professional judgment to review this rationale and either approve the alternate sites or require the system to comply with the protocol.

Keep in mind that the goal of the IDSE is for systems to choose Stage 2 DBPR compliance monitoring locations that are most representative of high TTHM and HAA5 concentrations throughout the distribution system.

Sampling Dates: The technical review of the IDSE Report for an SSS using existing monitoring results is very similar to the technical review of the IDSE Report for standard monitoring. Refer to section 3.11.1.4 for guidance on reviewing a system's Stage 2 DBPR monitoring site selection and schedule.

3.10 IDSE Option: Hydraulic Modeling System Specific Study

3.10.1 Review of Hydraulic Modeling SSS Plan

This section contains guidance on four different categories of reviews that can be completed for study plans based on existing monitoring results:

- Review for required plan elements
- Review for correct interpretation of the IDSE requirements
- Technical review of data representativeness
- Technical review of monitoring results

The first review for required plan elements will be done by the IPMC for EPA reviewers and states that choose to use it. The remaining reviews for correct interpretation of the IDSE requirements, technical review of data representativeness, and technical review of standard monitoring site selection, will be completed by either the state or EPA.

Chapter 6 of EPA's *IDSE Guidance Manual* provides in-depth information regarding how a system may prepare a plan for a modeling SSS.

The state or EPA may want to request additional information from a system during the review process. The state or EPA can approve the plan, request that the system modify its plan, or require standard monitoring if the plan is not acceptable. If a system does not respond to a request to modify the plan or to provide more information, the state or EPA has the option of requiring standard monitoring. EPA or the state has 12 months after the submission deadline to complete the review of Standard Monitoring Plans. All correspondence between the system and the reviewer is included in the 12-month period and does not extend the ultimate approval deadline. If EPA or the state does not contact the system to officially approve or request modifications to the plan by the end of the review period, the system can consider the plan approved and will implement it as submitted.

If the state or EPA intends to require standard monitoring, it is best to notify the system as early as possible. If it is early enough, the system may be able to comply within their original schedule. However, if the system is not notified in time to complete a Standard Monitoring Plan by the scheduled compliance date, EPA or the state should work with the system to set an alternate schedule. The alternate schedule could be based on one of the four regulatory schedules or it could be a schedule unique to that system. The IPMC is set up to accommodate alternate schedules.

The state or EPA should notify the system in writing when its plan is approved. If changes were made after the original submission, the state or EPA should send a copy of the approved plan to the system for its records or reference the changes in a letter to clarify which version of the plan is approved. If EPA is reviewing plans, all correspondence and recordkeeping will be through the IPMC.

Some states may not have staff that are trained or experienced in reviewing the data found in hydraulic modeling SSS and the types of water age or water quality models that will be submitted by utilities. EPA Headquarters will provide support to EPA regions and states that require technical assistance in reviewing models or who choose to have EPA review the model entirely.

EPA or the state should review each plan early in the review period to ensure that it contains the minimum elements required by the Stage 2 DBPR. For the modeling SSS, EPA or the state should also confirm that the system's model meets the minimum requirements for the SSS. In addition, they should conduct a technical review of system's model to ensure that it is capable of identifying distribution system locations with high TTHM and high HAA5 levels.

3.10.1.1 Review of Required Elements for Hydraulic Modeling SSS Plan

Table 3-8 can be used to determine if the system has met the minimum requirements of the Stage 2 DBPR for the modeling study plans. Systems have the option of using the Modeling Study Plan Form (Form 4) in Appendix E of this document. If systems fill out all sections of Form 4 according to the instructions, they have met the minimum requirements of the rule. Note that Form 4 asks the system to list its IDSE schedule and the required number of monitoring sites for the system. EPA or the state should verify that the schedule on Form 4 is consistent with the schedule in the letter sent to the system by EPA or the state. A completed example of a modeling study plan can be found in Appendix E of EPA's *IDSE Guidance Manual*.

If the system used Form 4, verify that the following information is correct:

- *Schedule* – Verify that the schedule is consistent with the schedule in the letter sent to the system by EPA or the state or with a schedule based on additional conversations with the system. This verification can be done by checking the schedule listed for that system in the DCTS. If the submitted schedule is different, EPA or the state should contact the system to discuss the required compliance schedule.

- *Number of sites* – Verify that the number of modeling SSS monitoring sites meets the minimum requirements for standard monitoring, as shown in Table 3-13. If a system misinterpreted its monitoring requirements, the reviewer should contact the system to explain what is required.

Table 3-8. Modeling Study Plan Checklist Required Elements

Check if Provided ☑	Required Element	Section in Form 4
☐	Population served by the system	I.A
☐	Source water type (Subpart H or ground water)	I.A
☐	Is the model an Extended Period Simulation (EPS) model?	III.A
☐	Does the model simulate 24-hr variation in demand and show a consistently repeating 24-hr pattern of residence time? (If calibration is not complete, this question can be answered in the IDSE Report.)	III.A
	Tabular or spreadsheet data demonstrating that the model meets the following minimum requirements:	
☐	• 75% of pipe volume.	III.A & VIII
☐	• 50% of pipe length.	
☐	• All pressure zones.	
☐	• All 12" diameter and larger pipes.	
☐	• All 8" and larger pipes that connect pressure zones, influence zones from different sources, storage facilities, major demand areas, pumps, and control valves, or are known or expected to be significant conveyors of water.	
☐	• All 6" and larger pipes that connect remote areas of a distribution system to the main portion of the system.	
☐	• All storage facilities with standard operations represented.	
☐	• All active pump stations with controls.	
☐	• All active control valves.	
☐	Model output showing 24 hour average residence time predictions throughout the distribution system (can be preliminary if calibration is not complete)	V & VIII
☐	Timing and number of samples planned for at least one round of TTHM and HAA5 monitoring during the historical month of high TTHM	II & IV

Check if Provided ☑	Required Element	Section in Form 4
☐	Description of how all requirements will be completed no later than 12 months after submission of the study plan	III.D
☐	A description of all calibration activities	III.B, III.C, & III.D
	A distribution system schematic with:	
☐	• All entry points	VII
☐	• All sources	
☐	• All storage facilities	
☐	• Locations and dates of all completed SSS monitoring (if calibration is complete)	
☐	• Locations and dates of Stage 1 DBPR compliance samples	
	If calibration is complete:	
☐	• Does the model simulate 24-hr variation in demand and show a consistently repeating 24-hr pattern of residence time?	III.A
☐	• A graph of predicted tank levels vs. measured tank levels for the storage facility with the highest residence time in each pressure zone	III.D & VIII
☐	• A time series graph of residence time at the longest residence time storage facility in the distribution system showing predictions for the entire EPS simulation period	V & VIII

Submissions to the IPMC will not be considered confidential business information (CBI) and are subject to the Freedom of Information Act (FOIA).

If some of the required elements on the checklist in Table 3-8 are missing, EPA or the state should contact the system to request the missing information. Until all required elements are submitted, the plan should be considered incomplete and should not be reviewed further. If the system does not complete their submission, they will receive a monitoring and reporting violation. If all boxes are checked, all required elements have been submitted.

3.10.1.2 Technical Review of Hydraulic Modeling SSS Plans

EPA or the state should review modeling study plans to ensure that the model meets all minimum requirements as well as to ensure that the modeling basis is sound and that good technical judgment was used. EPA or the state should consider the modeler's responses to questions on the Modeling Study Plan Form (Form 4) in Appendix E of this document to determine if the model is adequate. If a system does not use the forms, EPA and states can still use the information provided in this chapter to determine if a system submitted all the required information and to guide the review of the model and selected monitoring sites.

The checklists provided in this chapter can be helpful in determining if the model meets minimum requirements and to help EPA or the state address all issues. EPA or the state may use the checklist in Table 3-8 to ensure that the system has addressed all required issues related to model development and calibration. If the system used Modeling Study Plan Form (Form 4) in Appendix E and adequately

addressed all of the requirements therein, the system's model should meet the minimum requirements and the system should have provided all necessary model information. If the system has not completed calibration or sampling, the plan must provide a description of how all requirements will be met within 12 months of the date on which the study plan was submitted. If calibration is completed, EPA or the state should refer to the relevant review procedures discussed in this section below.

In order to provide a basis for reviewing the model information referenced in Table 3-8, EPA or the state may wish to request additional information referenced in Table 3-9. (If calibration is not complete, EPA or the state may wish to ask how these questions will be addressed during calibration.) Systems are required to respond to any state requests for additional information. States may modify the ISDE plan (or report) or require standard monitoring if information contained in the submission is inadequate for review and approval.

Table 3-9. Modeling Study Plan Checklist—Optional Modeling Information

Check if Provided ☑	Information	Section in Form 4
	Was a history of the model development and calibration provided?	
☐	• What has the model been used for?	III.B
☐	• What decisions have been based on use of the model?	
	How were water demands assigned?	
☐	• What method was used to assign demands throughout the system?	III.C
☐	• How did the system estimate the diurnal demand variation?	
☐	• How many demand categories were used?	
☐	• How were large demand customers addressed?	
	What other calibration information is provided?	
☐	• When was the model last calibrated?	III.D
☐	• What types of data were used? (e.g., tracer studies, fire flow tests)	
☐	• When was this calibration data collected?	
☐	• What field tests were done to collect calibration data?	
☐	• How were friction factors/C factors determined?	
☐	• If a water quality model is used, what parameters were used to calibrate the model? (chlorine residual, DBP data, SDS tests, etc.)	
☐	• Has the distribution system changed since the model was developed and last calibrated? If so, systems should describe the changes.	

Check if Provided ☑	Information	Section in Form 4
	How was system operation represented in the model?	
☐	• What time steps were used? What was the length of simulation?	V
☐	• Was modeling done using typical operating conditions during peak month of TTHM formation potential?	
☐	• How were operational controls represented (e.g., time controls or logic controls etc.)?	

In reviewing the modeling information obtained from the checklists in Tables 3-8 and 3-9, EPA or the state may wish to take the following information into consideration:

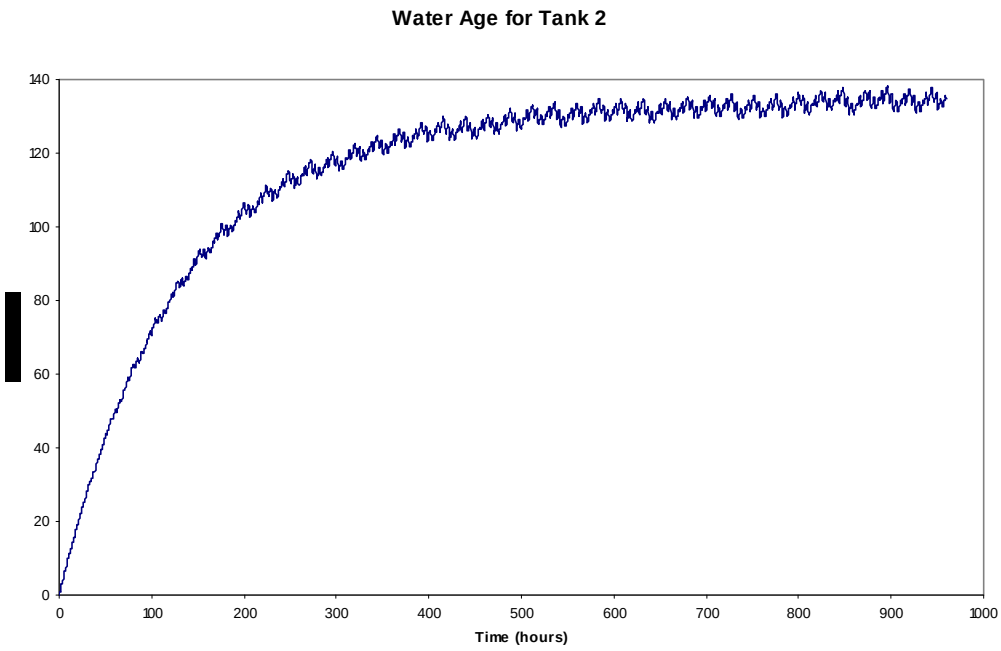
- Models that have been prepared for long-range master planning purposes are not likely to meet the minimum requirements. Models like this could be updated to meet the modeling SSS requirements. Calibrated models that were prepared for detailed distribution system design or operational studies are likely to be adequate.

- A model that has not been calibrated in the last 10 years will not likely produce results that are consistent with the current system configuration.

- The model must be calibrated using operating conditions that are representative of those during the month of peak historical TTHM formation potential.

- The model must be run for an extended time period so that system components, including the storage tank with the highest water age, show a pattern of repeating residence time. See Figure 3-2 for an example. Note that a similar graph must be presented as evidence of adequate model run-time.

Figure 3-2. Example Repeating Residence Time



- "Dead-end" areas that represent significant flow demands, such as industrial customers or large subdivisions, should be included in the model.

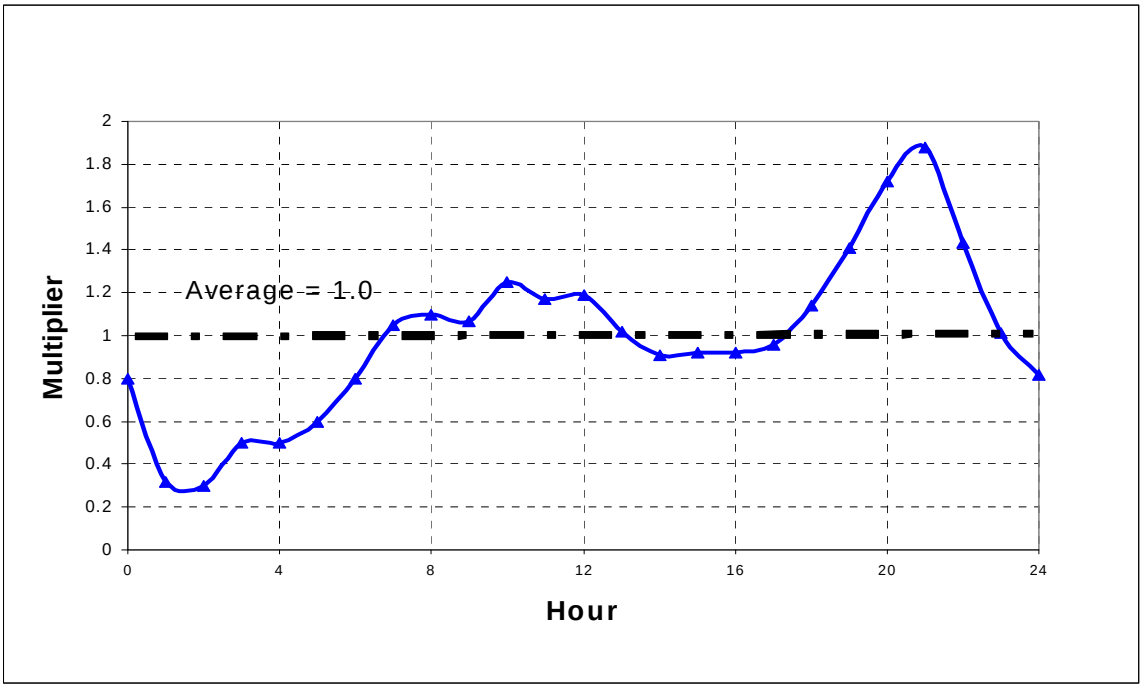
- Water demands should be allocated to as many nodes in the model as possible, and the allocation should represent the actual spatial distribution of the demands based upon metering records. Water demands from all significant users should be included.

- It is imperative that the model incorporate realistic demands for the peak month of TTHM formation.

- System water loss should be taken into account in the allocation of demands.

- Demand variations over the time period of the model simulation must be taken into account, including diurnal demand fluctuations. Figure 3-3 shows an example of a diurnal demand variation pattern. Where applicable, diurnal fluctuation patterns that are appropriate for each type of user (residential, industrial, etc.) should be used in the model.

Figure 3-3. Example Diurnal Demand Variation Pattern



- Time steps of 1-5 minutes for model calculations typically produce acceptable results.

- The actual operation of the distribution system (whether it is done manually, through telemetry, through other system controls, or a combination of these methods) should be simulated for the entire modeling time period. In general, model controls are either logic or time-based. Logic-based controls initiate an activity based upon a system condition (e.g., a well pump is activated because the water level in a tank has dropped 2 feet). Time-based controls perform an activity simply based upon a clock setting (e.g., a booster pump turns on to pump water to a storage tank from 8:00 to 9:00 a.m. every morning).

- The actual data collected for model calibration will vary according to the characteristics of each system. In general, calibration should incorporate the following information:

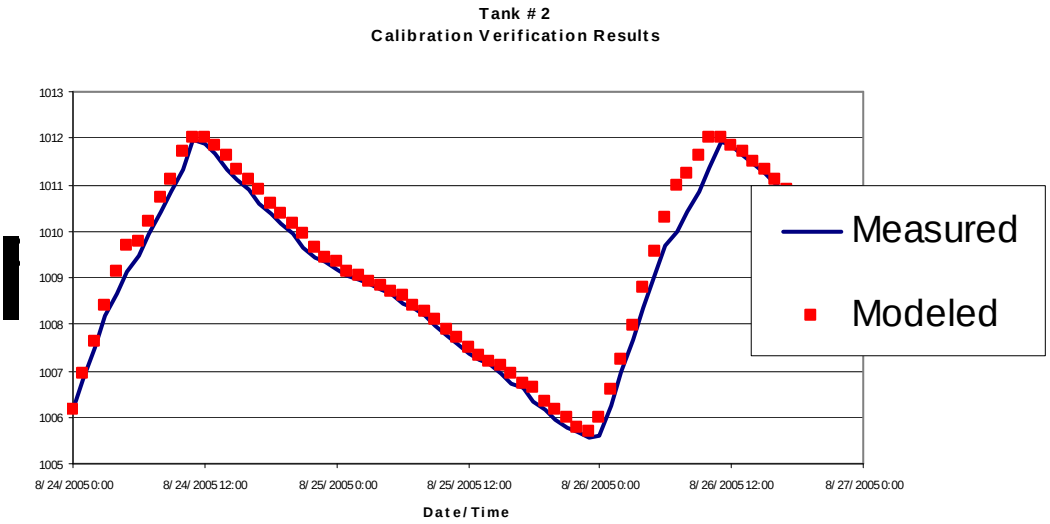
  – Flow from each pump or pumping facility (including the sequential operation of each pump).
  – Water level variations in each storage facility.
  – System pressure readings.
  – System flow tests (e.g., at hydrants).
  – Friction factor tests.
  – Field tests (e.g., flow testing at hydrants, may be needed).

Many systems collect operational data using supervisory control and data acquisition (SCADA) systems, chart recorders, or other types of data loggers. It is important to collect operational data over a 24-hour time period so that the model can be calibrated for each time step.

Figure 3-4 shows a graph of actual water levels measured in a storage tank versus the levels predicted by a calibrated model. This is an example of a model that has been well-calibrated using accurate demand

and operational data. Note that similar graphs must be submitted for the tank with the longest residence time in each pressure zone.

Figure 3-4. Example Verification Graph for a Tank with Highest Water Age



Remember that the model must be calibrated using operating conditions that are representative of those during the peak month of TTHM formation. If the model was not calibrated using these conditions, additional data may be needed to properly calibrate the model.

Modeling of systems that have multiple sources with widely varying DBP formation potential can be very complex. Appendix G of EPA's *IDSE Guidance Manual* discusses these concerns and three approaches for analyzing this type of system.

If the system has not adequately addressed all modeling questions in Table 3-8, EPA or the state should contact the system and request more information. If EPA or the state determines that the model and calibration plans are adequate, they can attach any new information to the study plan and complete the review.

EPA or the state may also wish to ask how the system plans to use the data from its round of monitoring at TTHM and HAA5 sites. For example, will the data be used to corroborate or further calibrate the model? If the data are not consistent with model predictions for TTHM, what steps will the system take to explain the inconsistency?

Systems conducting a modeling SSS should review all available compliance, study, or operational data to determine the peak month for TTHM formation for their system. This month sets the conditions for the model simulation and the schedule for the SSS monitoring. Systems with monthly or quarterly TTHM monitoring data should use this data as the basis for selecting the historical month. If a system does not have monthly or quarterly data, the month with warmest water temperature should be selected as the peak month for TTHM formation, although additional data (e.g., increases in TOC levels) may also be considered.

To ensure that an appropriate peak month was selected, EPA or the state should review the data submitted and the justification provided by the system. The EPA or the state review should determine whether the

system carefully considered all available TTHM data. See section 3.11.1.4 for technical guidance on reviewing selection of the peak historical month.

3.10.2 Review of Hydraulic Modeling SSS IDSE Report

All systems conducting an SSS must prepare an IDSE Report [§141.602(b)] and submit it to EPA or the state. The primary purpose of the IDSE Report is to provide EPA or the state with the system's recommendations for where and at what frequency Stage 2 DBPR compliance monitoring should be conducted. In addition, the system must provide justification for these selections. Remember, systems that include their compliance calculations procedures in their IDSE Report in addition to their monitoring locations and dates may not need to submit a Stage 2 Compliance Monitoring Plan. When completing the IDSE Report, systems have the option of using the IDSE Report for a Modeling SSS Form (Form 5) in Appendix E.

There are two different categories of reviews that should be done for IDSE Reports from systems that conduct an SSS:

- Review of IDSE Report for required elements.
- Technical review of Stage 2 DBPR compliance monitoring site selection and schedule.

The first review will be done by the IPMC for EPA reviewers and states that choose to use it. The remaining technical review of Stage 2 DBPR compliance monitoring site selection and schedule will be done by either state or EPA reviewers.

If the reviewer has any concerns about a report during the review, they can either request modifications to the report or contact the system to ask for additional information. The reviewer may also require additional locations for Stage 2 DBPR compliance monitoring. The number and frequency of samples must comply with Table 3-17, unless EPA or the state requires additional monitoring. Systems must follow the site selection protocol in this subsection unless they provide EPA or the state with adequate justification for alternate sites. For more information about selecting sites for Stage 2 DBPR monitoring, refer to EPA's *IDSE Guidance Manual*.

EPA or the state has a limited amount of time after the submission deadline to request modifications or approve the IDSE Report or contact the system to let them know that the review is not complete. The EPA or state deadlines for IDSE Reports approval, modification, or notification are listed in Table 3-1.

These dates are within 3 months of the submission deadline for systems on Schedules 1, 2 and 4, and within 9 months of the submission deadline for systems on Schedule 3. Note that this is 3 or 9 months from the submission deadline, not the actual date of submission. If the system does not receive approval or modification of the report, or notification that EPA or the state has not completed their review within that 3- or 9-month period, the system may consider the report approved as submitted and use the Stage 2 DBPR compliance monitoring sites recommended in the report.

If EPA or the state needs additional time for the review, they can contact the system within the 3- or 9-month period and let them know that the review requires additional time.

3.10.2.1 Review of Required Elements for Hydraulic Modeling IDSE Report

The basic elements required of an IDSE Report for an SSS based on modeled data are listed in the checklist in Table 3-10. A completed example of an IDSE Report for a modeling SSS can be found in EPA's *IDSE Guidance Manual*. Any required information that was not included in, or updated since, the

approved modeling study plan (e.g., because calibration was not yet complete) must be included in the IDSE Report (in addition to the information listed in the checklist in Table 3-10).

Table 3-10. IDSE Report for a Modeling SSS Required Elements Checklist

Check if Provided ☑	Required Element	Section in Form 5
☐	TTHM and HAA5 analytical results in a tabular or spreadsheet format from all Stage 1 DBPR and SSS monitoring conducted during the period of the SSS	V & XI
☐	Recommendations and justification of Stage 2 DBPR compliance monitoring sites and dates	VII
☐	24-hr time series graph of residence time for all Stage 2 DBPR monitoring sites selected	VI & XI
If the IDSE Report is NOT submitted at the same time as the SSS Plan		
☐	Population served and source water type (Subpart H or ground water) only if they have changed since the SSS plan.	I.A
☐	Distribution system schematic only if it has changed since the SSS Plan	X
☐	Explanation of any deviations from the approved SSS Plan	XI
	Final calibration information (if not already provided with the study plan)	
☐	Any information that was updated since the approved IDSE plan	III
☐	A graph of predicted tank levels vs. measured tank levels for the storage facility with the highest residence time in each pressure zone	III.B & XI
☐	A time series graph of the residence time at the longest residence time storage facility in the distribution system showing the predictions for the entire simulation period	III.C & XI
☐	Model output showing 24 hour average residence time predictions throughout the distribution system	III.C & XI

3.10.2.2 Technical Review of Hydraulic Modeling IDSE Report

The purpose of the technical review of the IDSE Report is to ensure that:

- The system's recommended Stage 2 DBPR compliance monitoring locations are in accordance with the protocol set in §141.605, or
- The system provided adequate justification for alternative locations, and
- The system has chosen appropriate dates on which to sample for Stage 2 DBPR compliance.

Systems should rely on qualifying data only, and they may compare data from their peak historical month in addition to LRAAs as they work through the protocol for selecting Stage 2 DBPR compliance

monitoring sites. However, they must provide a justification for relying on peak historical month data rather than LRAA data.

Remember, systems that conduct system specific studies may be submitting their IDSE Report with their study plans.

EPA or the state should notify the system in writing when its report is approved. If changes were made after the original submission, EPA or the state should send a copy of the approved plan to the system for its records. If EPA is reviewing reports, all correspondence and recordkeeping will be through the IPMC.

Stage 2 DBPR Monitoring Site Selection: A system that completes an SSS must recommend Stage 2 DBPR compliance monitoring locations using the data collected during the IDSE in addition to their Stage 1 DBPR sites. Justification must be provided for the final sites selected in the IDSE Report (including model results for water age at the relevant nodes, if a system is using modeled data). EPA's *IDSE Guidance Manual* provides a detailed discussion for Stage 2 DBPR site selection.

Systems must use the protocol in Table 3-15 to select their Stage 2 DBPR compliance monitoring sites. If a system is required to select more than eight sampling sites it must return to the top of the protocol, each time selecting from those sites that have not already been identified for Stage 2 DBPR monitoring until the required number of sites has been selected.

If a system arrives at Step 3 or Step 7 and has no more Stage 1 DBPR sites to select from, the system should skip these steps and continue with the protocol as necessary, until it has identified the required total number of monitoring locations. This may happen if the Stage 1 DBPR sites have the highest TTHM or HAA5 LRAAs and were previously selected, or if the system is a consecutive system and had little or no Stage 1 DBPR data, or if the system is very large but has few treatment plants. When this occurs, the total number of sites will be selected, but the distribution between TTHM, HAA5 and Stage 1 DBPR sites will be different than shown in Table 3-17.

EPA or the state should review the IDSE Report to assure that the system followed the site selection protocol correctly. EPA or the state should check that the system used the correct type of Stage 1 DBPR site in the third and seventh steps, depending on the system's source type.

If the system varied from the protocol in Table 3-15 it should provide a rationale for its selections. EPA or the state will use their best professional judgment to review this rationale and either approve the alternate sites or require the system to comply with the protocol.

Keep in mind that the goal of the IDSE is for systems to choose Stage 2 DBPR monitoring locations that are most representative of high TTHM and HAA5 concentrations throughout the distribution system.

Sampling Dates: The technical review of the IDSE Report for a hydraulic modeling SSS is very similar to the technical review of the IDSE Report for standard monitoring. Refer to section 3.11.1.4 for guidance on reviewing a system's Stage 2 DBPR monitoring site selection and schedule.

SSS IDSE Report Based on Modeled Data

EPA or the state may wish to ask the following questions related to site selection based on modeled data:

- How were the Stage 2 DBPR compliance monitoring sites selected to ensure that they are representative of the distribution system and represent nodes with high water age for TTHM? For

HAA5, do the sites represent areas with relatively high water age that are able to maintain a disinfectant residual?

- Were other water quality data (e.g., non-regulatory monitoring, TCR data, other) or water quality modeling data used to corroborate the selected Stage 2 DBPR monitoring sites? If so, that data should be provided.

In the review of modeling IDSE Reports, EPA or the state must ensure that the system's model meets minimum requirements and that the system adequately completed calibration of its model. If the system adequately completed the IDSE Report for a Modeling SSS Form (Form 5) in Appendix E, or if the model calibration was completed and approved as part of the model study plan, the system's model should meet the minimum requirements and the system should have provided all necessary model information. If the system did not use this form, or if calibration of the model was not complete or was changed after it was approved as part of the model study plan, EPA or the state may use the checklist in Table 3-10 to ensure that the system has adequately addressed all issues related to model development and calibration. The system must show that they fulfilled all approved plans for calibration. If the system has not adequately addressed all questions, EPA or the state should contact the system and request more information.

In reviewing the IDSE Report, EPA or the state should also consider the following:

- Review the 24-hour residence time graph for proposed Stage 2 DBPR compliance monitoring sites, and verify that the sites that the model predicted to have high residence time will be high during the time of day when the system is likely to be sampling. For instance, if the model predicts an area of the distribution system to have advanced water age during the middle of the night, but during the day time the water age decreases substantially, then the monitoring results at this site (likely to take place during the day time) will be of water with low water age and will not reflect high DBP levels.

- Was the data from the round of monitoring at TTHM and HAA5 sites used to corroborate or further calibrate the model? Was the data consistent with model predictions for TTHM? If not, what steps did the system take to explain or correct the inconsistency? If an inconsistency is unexplained, EPA or the state may wish to ask the system to explain it. It may be appropriate to take more samples to look for diurnal DBP fluctuations at the selected locations. EPA or the state may wish to suggest that the system perform further model calibration if they are confident that the sample results are actually representative of the distribution system water quality. If SSS monitoring results do not coincide with model predictions, the system should attempt to reconcile the differences before proceeding with Stage 2 DBPR site selection. Justification must be provided for the final sites selected in the IDSE Report (including model results for water age at the relevant nodes).

  – For example, the system could monitor at the problematic sites over a 24 hour period to see if a water age peak was missed initially.

  – Unexpected operational changes such as main breaks, or unusually high or low water use could affect results.

  – The time of sample collection should be noted and compared to the water age graph to determine if the sample time coincided with the time of maximum water age.

- Additional field data collected during the sampling period (e.g., chlorine residual, Heterotrophic Plate Count (HPC)) may help to explain discrepancies between modeling and sampling results.

- Systems may choose to resample at the site(s) or alternative sites.

- Systems should verify that the model represents the current configuration of the distribution system. Unexpected sampling results may indicate inconsistencies in the model.

A system that completes a modeling SSS must complete one round of TTHM and HAA5 sampling during the peak month for TTHM formation. The number of monitoring locations and the type of locations must be the same as that required for standard monitoring. Stage 1 DBPR monitoring locations cannot be used. Depending upon system size and type, sample locations may include near entry point sites, average residence time sites, high TTHM sites, and high HAA5 sites. It is important that the site selection be done with consideration given to the model results and that the site selection requirements of the Stage 2 DBPR be addressed. The site selection process should also take into account water quality data (e.g., chlorine residuals and HPC results).

Systems must use the protocol in Table 3-15 to select their Stage 2 DBPR compliance monitoring sites. TTHM and HAA5 results and modeled water age are the most important factors in site selection. Systems should have considered both predicted average water age and the 24-hour variation in water age. If systems selected between two sites where one had large variations in water age throughout the day and the other was relatively consistent, they should have selected the site with consistent water age. Sites with discrepancies between model results and SSS monitoring results can be selected as Stage 2 DBPR compliance monitoring sites if justification is provided in the IDSE Report.

If SSS monitoring results do not coincide with model predictions, the system should attempt to reconcile the differences before proceeding with Stage 2 DBPR site selection. For example, the system could monitor at the problematic sites over a 24-hour period to see if a water age peak was missed initially. Unexpected operational changes such as main breaks, or unusually high or low water use could affect results. Re-sampling at alternative sites should be considered.

3.11 IDSE Option: Standard Monitoring

States should be aware that any system can conduct standard monitoring [§141.601], even if they meet exemption criteria or have enough data to conduct an SSS. Most CWSs and NTNCWSs serving at least 10,000 people that do not qualify for a 40/30 Certification or a VSS Waiver are likely to use this option. Standard monitoring data in addition to Stage 1 DBPR data will be used to select Stage 2 DBPR compliance monitoring locations.

Standard monitoring entails 1 year of distribution system monitoring at more locations and greater frequency than Stage 2 DBPR compliance monitoring. The sampling frequency and minimum number of sample locations required depend on system characteristics such as population served, source water type, and whether the system is a consecutive system. (The monitoring periods and frequency of sampling, along with the minimum number of samples required, are detailed in Table 3-17.) Systems that conduct standard monitoring must submit a Standard Monitoring Plan and an IDSE Report to EPA or the state. Recommendations presented in the IDSE Report for compliance monitoring locations will be used to develop the Stage 2 DBPR Compliance Monitoring Plan. Note that systems are likely to report all the information required in the Compliance Monitoring Plan in their IDSE Report, including compliance calculation procedures. These systems may not need to submit a separate Compliance Monitoring Plan.

States should ensure that systems conduct standard monitoring during the peak historical month for TTHM or HAA5 levels or the month of warmest water temperature, if DBP data are not available. All IDSE samples must be taken as dual sample sets (i.e., a TTHM and a HAA5 sample must be taken at each site). The IDSE monitoring results will not be used to determine compliance with MCLs. Although the individual results are not required to be reported in the CCR, the range of values must be included.

When notifying consecutive systems of these requirements, states may wish to send copies of the correspondence to the associated wholesale systems to minimize confusion about sampling responsibilities.

3.11.1 Review Considerations for Standard Monitoring Plan

Systems must submit Standard Monitoring Plans by the deadlines specified in Table 3-1. EPA or states should complete five different categories of reviews for Standard Monitoring Plans:

- Review for required plan elements.
- Review for complexity.
- Review for correct interpretation of the IDSE requirements.
- Technical review of peak historical month.
- Technical review of standard monitoring site selection.

The first two, review for required plan elements and review for complexity, will be done by the IPMC for EPA reviewers and states that choose to use it. The three remaining reviews for correct interpretation of the IDSE requirements, technical review of peak historical month, and technical review of standard monitoring site selection, will be done by either the state or EPA. EPA's *IDSE Guidance Manual* provides detailed information regarding how a system should prepare a Standard Monitoring Plan.

3.11.1.1 Review of Required Elements for Standard Monitoring Plan

States can use Table 3-11 to determine whether a Standard Monitoring Plan contains the required elements. Systems have the option of using the Standard Monitoring Plan Form (Form 6) in Appendix E. If systems fill out all sections of the form according to the instructions, they have met the minimum requirements of the rule.

Table 3-11. Standard Monitoring Plan Required Elements Checklist

Check if Provided ☑	Required Element	Section in Form 6
☐	Population served by the system	I.A
☐	Source water type (Subpart H or ground)	I.A
☐	Peak historical month	V.A
☐	Proposed dates of standard monitoring	V.D
☐	Dates of planned Stage 1 DBPR compliance monitoring	VI
☐	Justification of standard monitoring site selection	IV
☐	Summary of data relied on to justify standard monitoring sites	III.B

Check if Provided ☑	Required Element	Section in Form 6
A distribution system schematic with:		VII
☐	• All entry points	
☐	• All sources	
☐	• All storage facilities	
☐	• Locations of proposed standard monitoring sites	
☐	• Locations of Stage 1 DBPR compliance sampling	

If some of the required elements on the checklist in Table 3-11 are missing, EPA or the state should contact the system to request the missing information. Until all required elements are submitted, the plan should be considered incomplete and should not be reviewed further. If all boxes are checked, all required elements have been submitted.

3.11.1.2 Review for Complexity of Standard Monitoring Plan

The checklist provided in Table 3-12 is designed to determine if a Standard Monitoring Plan is straight-forward or if it is complex and requires a more in-depth review. This tool can be helpful to the reviewer to prioritize workload and plan for completion of all reviews by the end of the review period.

Table 3-12. Standard Monitoring Plan Triage Checklist

REVIEWER INFORMATION	
System Name_____	PWSID_____
Reviewer_____	Review Date_____
The purpose of this checklist is to provide a brief review of a Standard Monitoring Plan based on the optional format provided in the guidance manual. This review will determine whether, due to complexity and/or adequacy issues, the plan should be considered straight forward or requiring a more detailed review. **If 5 or more of the following issues are checked, the plan should be categorized as requiring a more detailed review.**	
I. GENERAL INFORMATION	
☐ Population is ≥ 500,000.	
☐ Population is < 10,000 and system is on Schedule 1, 2, or 3.	
☐ Chloramines not checked.	

III. SELECTING STANDARD MONITORING SITES

☐ Hydraulic model and/or tracer study was checked

☐ TTHM or HAA5 column has only one box checked

IV. JUSTIFICATION OF STANDARD MONITORING SITES

☐ Incomplete or inadequate justifications
- each is 7-10 words or less
- no data provided
- incorrect use of data

☐ All TTHM sites or all HAA5 sites have the same text for justification

☐ System has distribution storage (check schematic), but justifications do not address sites located downstream of storage

V. PEAK HISTORICAL MONTH AND STANDARD MONITORING DATES

☐ Peak historic month is not well justified.
- Little or no justification given for choice of peak historic month.
- "Other" is only box checked for peak historic month.

☐ Total number of monitoring sites and number of monitoring periods do not agree with information in Section II of the form.

☐ Sampling schedule is incorrect (not every 60 or 90 days, incorrect frequency).

VI. PLANNED STAGE 1 DBPR COMPLIANCE MONITORING DATES

☐ Systems has very few Stage 1 sites compared to required standard monitoring sites - Number of standard monitoring sites is in Section V is 4 times or more than the number of Stage 1 sites in this section.

☐ System has no Stage 1 sites (e.g., consecutive system that did not monitor under Stage 1). Check both boxes if true.

VII. DISTRIBUTION SYSTEM SCHEMATIC

☐ Key distribution system components are obviously missing
- No indication of pressure zones, large transmission mains, tanks, or pumping stations, and the description of data and justification in Section IV of the form indicates that the system has these components.

☐ Source (check one box for each)
- two or more surface water or GWUDI sources
- two types of sources (surface/GWUDI and ground)

☐ Distribution (check both boxes if more than two apply)
- many long branches
- three or more booster chlorination sites
- four or more pressure zones
- five or more booster pump stations
- six or more finished water storage tanks in the distribution system

☐ Stage 1 and Standard Monitoring sites do not geographically represent the distribution system.

SENSITIVE INFORMATION
☐ Does the plan include sensitive information that should not be made available to the public? • Identifying information on tanks and sources such as street names or addresses • Security features (e.g., locations of fences, cameras, monitors)

Note that the checklist includes a category for sensitive information. Submissions to the IPMC will not be considered confidential business information (CBI) and are subject to the Freedom of Information Act (FOIA).

If five or more of the boxes in Table 3-12 are checked, the plan should be categorized as requiring a more detailed review. If fewer than 5 boxes are checked, the plan should be categorized as requiring a standard review. This information can then be used to assign plans to individual reviewers and/or prioritize workloads.

The elements in Table 3-12 were selected to help identify systems that are either very complex or have difficulty understanding the IDSE requirements.

3.11.1.3 Review for Correct Interpretation of Standard Monitoring Requirements

Review of the Standard Monitoring Plan should include verifying that the system has identified the correct schedule as well as the required number and type of standard monitoring sites and monitoring frequency. This information is listed in the Standard Monitoring Plan Form (Form 6) in Appendix E.

- *Schedule* - Verify that the schedule is consistent with the schedule in the letter sent to the system by EPA or the state or with a schedule based on additional conversations with the system. This verification can be done by checking the schedule listed for that system in the DCTS. If the submitted schedule is different, EPA or the state should contact the system to discuss the required compliance schedule.

- *Number and Frequency* - Verify that the number and types of sites and monitoring frequency meet the minimum requirements of the rule, as shown in Table 3-13. If the system has fewer near entry points than the required number of near entry point sites, systems must make an adjustment to the required number of samples. If a system misinterpreted its monitoring requirements, EPA or the state should contact the system to explain what is required.

Table 3-13. Standard Monitoring Requirements

Source Water Type	Population Size Category	Monitoring Periods and Frequency of Sampling	Distribution System Monitoring Locations[1]				
			Total per monitoring period	Near Entry Points	Average Residence Time	High TTHM Locations	High HAA5 Locations
Subpart H	<500 consecutive systems	one (during peak historical month	2	1	-	1	-
	<500 non-consecutive systems		2	-	-	1	1

Source Water Type	Population Size Category	Monitoring Periods and Frequency of Sampling	Distribution System Monitoring Locations[1]				
			Total per monitoring period	Near Entry Points	Average Residence Time	High TTHM Locations	High HAA5 Locations
	500-3,300 consecutive systems	four (every 90 days)	2	1	-	1	-
	500-3,300 non-consecutive systems		2	-	-	1	1
	3,301-9,999		4	-	1	2	1
	10,000-49,999	six (every 60 days)	8	1	2	3	2
	50,000-249,999		16	3	4	5	4
	250,000-999,999		24	4	6	8	6
	1,000,000-4,999,999		32	6	8	10	8
	≥ 5,000,000		40	8	10	121	10
Ground Water	<500 consecutive systems	one (during peak historical month)[2]	2	-	-	1	-
	<500 non-consecutive systems		2	-	-	1	1
	500-9,999	four (every 90 days)	2	-	-	1	1
	10,000-99,999		6	1	1	2	2
	100,000-499,999		8	1	1	3	3
	≥ 500,000		12	2	2	4	4

1. A dual sample set (i.e., a TTHM and an HAA5 sample) must be taken at each monitoring location during each monitoring period.
2. The peak historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature.

3.11.1.4 Technical Review of Standard Monitoring Plan

Two primary goals of the standard monitoring schedule are to ensure that the system is sampling during the period of the highest DBP formation and that the sampling is spaced out evenly throughout the year and geographically to provide representative data. The peak historical month sets the schedule for all standard monitoring sampling. Standard monitoring must include sampling during the peak historical month, but sampling may begin prior to this month depending on the system's compliance schedule.

Peak Historical Month

The "peak historical month" will either be the month with highest TTHM, highest HAA5, or warmest water temperature. If a system has to sample more than once during the monitoring period, the other sample months will be spaced at 60 days or 90 days around the peak historical month. Systems have discretion in selecting the peak historical month. They should review available compliance, study, or operational data and should use best professional judgment to determine the peak historical month.

Systems should typically start by considering the month of highest TTHM or HAA5 levels. Ideally they should consider monthly data if available (rather than just quarterly data). If high TTHM and HAA5 levels occur in different months, they should consider which contaminant is of greatest concern. For instance, either TTHM or HAA5 might be closer to the MCL on a regular basis. Data may also indicate that one of the contaminants has a dramatic peak versus a minor spike in levels. If high TTHM or HAA5 levels occur in different months in different years, the systems should choose the year that was more representative of typical system operating and weather conditions.

Systems should also consider the month of warmest water temperature. In general (but not always), the concentration of organic matter in water increases during the warmest months of the year and is higher in warmer climates. Because organic matter reacts with chlorine and other chemical disinfectants, more organic matter in the water can result in a higher chlorine demand to maintain a reliable residual throughout the distribution system. The combination of a larger chlorine dose, warmer water temperatures that speed up chemical reactions, and larger concentrations of organic matter often result in higher TTHM and HAA5 concentrations during the warmest months of the year.

Surface water systems are likely to have adequate temperature data, while ground water systems are likely to have only moderate fluctuations in temperature, and may not have much data. In some situations, the month of warmest water temperature may not be representative of highest TOC and DBP levels. For instance, in New England, the month of warmest water temperature may be late summer, but these systems may see dramatic spikes in TOC levels in the late fall after the leaves have fallen. For systems that have insufficient water temperature data, other data such as ambient air or climate data may be used to determine the month of warmest water temperature.

When determining whether the appropriate peak historical month was selected for a particular system, EPA or the state should determine what type of source(s) the system uses. If the system uses surface water, items EPA or the state may consider are:

Did the system check high TTHM, high HAA5, and/or warmest temperature as a basis for the peak historical month?	The system must use one of these factors as the basis for the peak historical month. They can look at additional information, but they must check at least one of these boxes. TTHM and HAA5 are the preferred basis for selecting peak historical month if the system has monthly or quarterly TTHM and HAA5 data. If the system has not taken regularly spaced quarterly samples, EPA or the state may want to consider water temperature in addition to available TTHM and HAA5 data when approving the peak historical month.
Did the system select a month with high TTHM and high HAA5 and provide justification?	Based on their DBP data, systems should determine the month in which TTHM and HAA5 levels are highest and choose this month as the peak historical month. If the highest TTHM and/or HAA5 levels occur at different times during different years, the system should choose the year of data that is most representative of typical system operating and weather conditions. If the highest TTHM and HAA5 levels occur in different months, the system should consider which contaminant is of greater concern. If one contaminant clearly shows a higher overall trend and is closer to the MCL, the system should choose the month in which that contaminant is highest.

Did the system select a month with warm water temperature?	The peak historical months is of primary concern for surface water systems that have wide swings in temperature. To identify the month of warmest water temperature, systems should calculate the average water temperature for each summer month. If available, they should use data from several years. If the warmest temperature occurs in different months in different years, the system should select the year(s) that are most typical of climatological and water quality data and water use for their region. Although the system can set their peak historical month based on factors other than temperature, they should not choose a month in which the water temperature is colder than average.
When might a system choose a month based on a parameter other than water temperature?	High TOC levels – If the system has data showing high TOC levels that indicate a high potential for DBP formation, they may determine that this month is more representative of high DBP levels. For example, a system in New England may experience spikes in organic loading to their source in the autumn when leaves fall from the trees. Although this may not be the warmest water month, water is still relatively warm and organic loading is a substantial factor. Low water usage – The system may choose a month based on low water usage corresponding to longer residences times. For example, if a system has a seasonal population that peaks during the summer and drops off during the fall, residence time during the fall will be high, and water temperatures will still be relatively high.
What should have been submitted if a month other than highest TTHM, highest HAA5, or warmest water temperature month is chosen?	If a month other than a highest TTHM, highest HAA5, or warmest water month temperature was selected, the submittal should include adequate justification that EPA or the state finds convincing. If the system does not provide adequate justification, EPA or the state should contact the system for more information.
What if a system has multiple surface water sources?	For systems with multiple surface water sources, the system should have used the source of greater concern to select the peak historical month. This should be the source with the warmest water temperature and/or that provides the largest volume of water and/or the highest potential for DBP formation (e.g., high TTHMs, high HAA5s, high TOC).
What if the system has a mixture of surface and ground water sources?	If the system has a combination of surface and ground sources, they should have used the surface water source(s) data to determine the peak historical month. The system should typically choose the month with the warmest water temperature for the surface water source. If a different month was selected, the system should provide adequate justification. An example of this might be when a low TOC ground water source is only active during warm months and dilutes a high TOC surface water source that is in operation year round.

If the system uses ground water only, items EPA or the state may consider are:

What are the primary concerns for ground water systems?	Since the water temperature typically does not vary as much in ground water systems, selecting a warm temperature month is not as critical. If a month other than a warm temperature month is selected, the system should have checked high TTHM, high HAA5, and/or provided additional justification.
What if the system has multiple ground water sources?	For systems with multiple ground water sources, the source of greater concern for DBP formation should have been used to select the peak historical month. This may include considering which has greater flow, which has higher temperatures, or which has higher TOC and therefore a greater potential for DBP formation.

If EPA or the state has concerns about the peak historical month selected, they should contact the system for more information.

Monitoring Schedule

EPA or the state should check the projected monitoring schedule and confirm that monitoring is planned:

- At least at the frequency required by the rule, and
- That there is one round of sampling during the peak historical month.

EPA or the state should check the projected monitoring schedule and confirm that monitoring is planned at least at the minimum frequency required by the rule (e.g., once a year, every 60 days, every 90 days, as specified in Table 3-13) and that one sampling period is during the peak historical month. Note that a system does not have to sample at exactly the frequency specified for the system. Sampling within the same week during each required month is sufficient. For example, a system on quarterly monitoring could sample in the third week of every third month. Holidays and sampling schedules for other water quality programs should be considered when developing a standard monitoring schedule.

If EPA or the state has concerns about the monitoring schedule submitted, they should contact the system for more information.

Site Selection

The most important component of the plan review is to ensure that standard monitoring sites meet the intent of the Stage 2 DBPR: to find locations that are most representative of high TTHM and HAA5 concentrations throughout the distribution system for Stage 2 DBPR compliance monitoring. EPA or the state should focus on whether the system considered all key information in its determinations and that data are not missing or misinterpreted. EPA or the state may ask the system to modify the plan in any way they find appropriate to ensure that standard monitoring meets this goal.

Systems are required to include a summary of data they considered while selecting their standard monitoring locations. This should include a discussion of their sources, types of data that are available, ranges and averages of disinfectant residual concentrations, and a general discussion of distribution system operations. This summary will serve as a basis for the review, giving EPA and states an overview of what information is available to the system so they can determine whether the selected standard monitoring sites adequately represent areas of the distribution system likely to have high TTHM and HAA5 concentrations.

EPA or the state should use whatever resources are available to review site selection for each system. The more familiar they are with the system, the more knowledgeable they will be in their review of the most appropriate sites the system should have selected. EPA or the state should use distribution system schematic in conjunction with the written justifications and summarized data to determine if the system's justifications are consistent with the geographic locations of sites. EPA's *IDSE Guidance Manual* includes extensive discussion of how systems can use available data to select their standard monitoring sites.

Use of Distribution System Map to Evaluate System Representation: Distribution system maps are essential when making site selection decisions. Maps can help systems identify the conditions described below:

- *Pipe Dead Ends* – Dead ends may occur in areas of stagnation and long water residence time. Pipe of large diameter may have low flows, and this may result in water with long residence times. Certain types of pipe or older pipe may allow biofilm build-up. Because biofilm degrades HAA5, pipes with biofilm build-up may have water with lower levels of HAA5.

- *Water Use* – Lightly developed areas may have low flows and therefore longer water residence times. In turn, highly developed areas may have high flows and be less likely to have high residence times and levels of DBPs. Areas where there is a major user also may have low residence time.

- *Entry points and sources* – Entry point locations may be sites of highest residual and lowest residence time. These sites are good points of reference.

- *Key components* – Storage tanks, pump stations, and booster chlorination stations all have substantial impact on residence time and DBP formation.

EPA or the state should use the system's map to ensure that the sites selected represent the entire distribution system. The system should have chosen as many priority sites as possible, depending on how many priority areas exist and how many sites are required. The sites should provide good geographic and hydraulic representation. If a system does not choose sites with good geographic coverage, they must provide adequate justification (e.g., the system has multiple plants with a wide variation in DBP levels). Most key sites in the distribution system should also be represented in the system's Standard Monitoring Plan. If not, EPA or the state should consider whether there is a way to redistribute the sites to include the most important ones.

If it is hard to tell on the schematic, EPA or the state should check to see if these factors are mentioned in the justifications.

Water Quality Data: Water quality data will usually play a key role in determining the best standard monitoring sites. Note that distribution system data are only helpful if it is representative of the current operating conditions and system configuration. If any substantial changes have been made to the treatment processes (particularly the disinfection processes), distribution system operation, or physical layout of the distribution system, the data may no longer reflect water quality in the distribution system.

- *Source Water* – If the system has multiple sources, the sources may have varying levels of precursors, and therefore may produce finished water with higher DBPs or DBP potential. Areas in the distribution system that are fed primarily by sources with higher DBPs may be better sites for high TTHM or HAA5.

- *Stage 1 DBPR Data and Other DBP Data* – Existing Stage 1 DBPR monitoring data and other operational data will be helpful in locating areas with high TTHM or HAA5 concentrations. Remember that systems cannot use Stage 1 DBPR sites themselves as any of their standard monitoring sites. Historic data should be evaluated taking data on raw water quality at the time of monitoring (if available) into account. For example, samples collected during a period of particularly poor source water quality may have shown higher than normal DBP levels in the distribution system.

- *Disinfectant Residual Data* – As water ages, disinfectants will be consumed and residual levels will drop. For this reason, low disinfectant residual can often (but not always) be considered an indication of advanced residence time. When using residuals to estimate water age, systems should look at the drop in residuals rather than the levels themselves.

  – Keep in mind that other factors, such as pipe age, condition, material, and lining and the presence of biofilm or sediment, can influence decay of disinfectant (resulting in low residual levels) but not lead to high DBP levels.

  – If a system uses booster chlorination, disinfectant residual levels will be elevated in areas affected by the booster chlorination. Booster chlorination is typically used in areas where the system has a difficult time maintaining a residual which is where water residence times are often high, so despite high residual levels, the residence time is high.

  – Sources of residual data include compliance monitoring data (SWTR residual monitoring data or Stage 1 DBPR chlorine, chloramines, and/or chlorine dioxide monitoring data), operational sample data, or data from special samples taken in response to customer complaints.

- *HPC Data* – A system may have collected HPC data instead of or in addition to disinfection residual levels or for other operational purposes. Elevated HPC levels may be indicative of biofilm. Because HAA biodegrades, areas in the distribution system that have no residual and/or elevated HPC may be areas where HAA levels have decreased.

<u>Distribution System Operating Data</u>: Distribution system operating data can reflect water flow patterns through the distribution system, which is essential in understanding residence time and DBP formation potential.

- *Water flows* – Pump run times, information on metered flows between pressure zones, and billing records for major users can all provide insight into water flow patterns. Pump run times can help systems understand when, where, how often, and how much new water enters the distribution system. This information, in turn, can help systems understand where and when water has the longest residence times.

  – Records of flows between pressure zones can help characterize water movement and increased or decreased residence time.

  – Analyzing the billing records for major users can indicate where there are high flows. High flows will result in decreased residence time. As a consequence, areas of a distribution system with a major water user may not be as likely to have high DBPs as other areas of the distribution system. If a system's distribution system is metered, the system can use meter records to track water usage.

  – If the system has access to hydraulic modeling or tracer studies, these tools will be excellent sources for determining average and max residence time.

- *Tank level records and tank configuration* – Tank operation and configuration can have a significant impact on residence time. In general, tanks increase residence time for water and can increase DBP formation. During tank fill times, the water in the vicinity of the tank will likely be newer. During draw times, the water downstream of the tank will likely be older. Note, however, that the impact of tanks on DBP formation can be complicated by individual tank configuration and mixing characteristics. Many tanks have a common inlet and outlet (this practice is called

"floating on the system"). This configuration sometimes results in the newest water leaving the tank first; older water is only drawn out during periods of highest demand. This configuration also prevents water mixing in the tank. During times of very high usage, areas directly downstream of a tank with a common inlet and outlet may be receiving very old water.

- *Booster chlorination* – Booster chlorination is typically used in areas where the system has a difficult time maintaining a residual. This is also often where water residence times are high. In addition, when the disinfectant residual is increased, if precursors are still available, DBP formation will be increased.

Review Individual Site Selection for the Four Types of Sites

EPA or the state should ensure that systems have an understanding of what factors affect DBP formation to enable them to select sites that best represent near entry point, average residence time, high TTHM, and high HAA5 sites.

- *Precursor concentration* – The concentration of organic matter in the source water and the effectiveness of removal through the treatment processes will be factors in DBP formation. If a system has multiple sources, the sources/plants that have higher levels of precursors can be expected to have higher DBPs. Areas in the distribution system served primarily by these sources may therefore have higher DBPs.

- *Disinfectant type and concentration* – The disinfectant type has a dramatic impact on DBP formation. Free chlorine is found to form DBPs most readily. The use of chloramines results in very low DBP formation. When using ozone, bromate can be found as a DBP, and systems that use chlorine dioxide can have chlorite formation. Obviously the higher the dose, the more disinfectant is available for reaction with precursors.

- *Water chemistry* – Water temperature, pH, and alkalinity all impact DBP formation at the plant and in the distribution system. In general, TTHM formation increases with increasing pH. HAA5s are more readily formed at lower pH levels.

- *Water temperature* – Higher temperatures typically speed up chemical reactions and can accommodate faster DBP formation. In general (but not always), the concentration of organic matter in water increases during the warmest months of the year and is higher in warmer climates. In addition, because organic matter reacts with (consumes) chlorine and other chemical disinfectants, more organic matter in the water can result in a higher chlorine demand to achieve contact time (CT) and maintain a reliable residual throughout the distribution system. The combination of a larger chlorine dose, faster chemical reactions, and higher concentrations of organic matter, often result in higher TTHM and HAA5 concentrations during the warmest months of the year.

- *Residence Time* – All chemical reactions take time. In general, the more time precursors have in contact with the disinfectant, the more DBPs will be formed. This is particularly true of TTHM concentrations which are generally highest in water that has resided in the distribution system the longest. This is not necessarily true of HAA5 that are found to form and then degrade.

- *Biodegradation* – HAA5 formation and decomposition seems to follow a pattern that is different from that of TTHM in the distribution system. While TTHM concentrations are generally highest at the points in the system with the longest residence times, research suggests that HAA5 seem to form and then decompose due to "biodegradation." Where biological activity is prevalent in the

distribution system (pipe with biofilm, areas with no disinfectant residual or high HPC), HAA5 levels may not be at their highest despite advanced residence time.

A number of factors may require professional judgment, including:

- *Geographic representation* – Sites should represent the entire distribution system. If a system is deciding between two monitoring sites, it may be appropriate to select the site that improves coverage of the entire distribution system (e.g., a site in a remote area of the distribution system). Keep in mind that systems will continue to sample under Stage 1 DBPR, so these high sites are already represented.

- *Hydraulic representation* – Systems should attempt to include sites that represent all pressure zones. In some situations, sites close to each other may represent different hydraulic zones.

- *Multiple sources* – If a system has multiple sources, they will want to consider the DBP formation potential of the sources and may want to select more sites in areas fed by sources with higher precursors and higher DBP formation potential.

- *Multi-task sites* – In some cases, one site may represent several potential causes for DBP formation. For example, a site located at the edge of the distribution system, downstream of a tank, and with low residual levels may cover three potential causes for DBP formation.

- *Accessibility* – Monitoring sites must be accessible throughout the year. Public buildings and TCR sampling sites are examples of sites that are accessible year-round.

<u>Near Entry Point Standard Monitoring Sites</u>

When reviewing near entry point sites, EPA or the state should consider the following items:

- *Location* – The location of the near entry point site is important. The Stage 2 DBPR does not define near entry point sites explicitly, but they should be located between the entrance to the distribution system and the first customer, but no later than the first customer.

- *More entry points than near entry point locations* – If the system has more entry points than required near entry point locations, EPA or the state should verify if the system selected entry points with the highest annual water flow.

- *Fewer entry points than near entry point locations* – If the system has fewer entry points than required near entry point sites, EPA or the state should make sure that the system replaced the remaining samples with locations of high TTHM and HAA5 concentrations, alternating between locations of high TTHM concentrations and locations of high HAA5 concentrations.

  – In cases where there is an odd extra location, the system must sample at a location of high TTHM concentration. For example, if the system needs three additional samples, it must take two samples at locations of high TTHM concentration and one sample at a location of high HAA5 concentration.

  – Although the distribution of site types may be different than listed in Table 3-13, the total number of sites must be the same.

Average Residence Time Standard Monitoring Sites: Average residence time is the average age of water delivered to the majority of customers in a distribution system. In most distribution systems, average residence time is not simply one-half the maximum residence time. Ideally, it should be a flow-weighted or population-weighted analysis. EPA recognizes that determining this value is very complex. Systems should rely heavily on professional judgment and many will need to use a rough estimate of average residence time.

Estimating average residence time requires a thorough understanding of the distribution system. A system map, used in conjunction with hydraulic modeling (if available), system operating data and disinfectant residual data can help systems to identify areas that are representative of average residence time.

- One of the best ways to calculate average residence time is by using a hydraulic model. A hydraulic model can take into account water flows and water use patterns.

- If modeling or tracer studies are not an option, the system may want to consider analyzing water flows using pump run data and metering information.

- Systems can also use disinfectant residual as a surrogate for residence time. The theory is based on the assumption that sites with average residual may be representative of average residence time.

  – When calculating average disinfectant residual, it is important to consider data from sites that are representative of the entire distribution system. One way to do this is to examine data collected at TCR monitoring sites (the TCR requires that all monitoring sites combined represent the distribution system). Using averages from individual monitoring sites, systems can calculate an overall distribution system average residual concentration. Individual sites with an average residual close to the distribution system average can be considered representative of average residence time in the distribution system.

  – As discussed earlier, if this option is used, the system has to be aware that some factors other than residence time can result in an increased or decreased residual. Residual data collected after booster chlorination should be omitted unless the system can estimate what the residual would be without the added disinfectant. Residual data collected in areas of the distribution system that are known to have biofilm growth or other factors that consume residual should also be omitted.

Appropriate justification for average residence time sites differs for systems of different complexity and size. For small systems with straightforward distribution system layouts (e.g., simple branched layout or a small looped system) and few large customers, the average residence time site should be generally in the geographic center of the distribution system.

Systems with multiple sources and multiple pressure zones face a greater challenge in locating sites with average residence time. Systems with complex distribution systems should have evaluated disinfectant residual data or used a hydraulic model or tracer study to select average residence time sites. EPA or the state should verify that the system located average residence time sites in each pressure zone and/or in the area influenced by each source if possible.

High TTHM Standard Monitoring Sites: TTHM formation is strongly influenced by residence time. In addition, TTHM formation generally increases with increasing pH. TTHM sites should not be located at dead ends with no users. The sampling should be representative of water that is being consumed, not stagnant water. EPA or the state should verify that sites selected near dead ends are located before the last

customer or group of customers, not at the very end of the dead end line. In addition, sites should be upstream of booster chlorination and after the last hydrant or blowoff.

Because TTHM formation is strongly related to water age, EPA or the state should verify that the system has chosen high TTHM sites that are expected to have long residence times. Excellent sites for high TTHM include:

- *Tanks* – down-gradient of storage facilities, which have increased residence time.
- *Low flows* – sparsely populated areas with low flows.
- *Geographic dead ends* – areas that are physically located at the end of a water main or group of water mains without looping back to the main portion of the distribution system. However, do not sample stagnant water after the last customer. The purpose is to sample water that customers are consuming.
- *Hydraulic dead ends and mixing zones* – areas in which there is little movement of water.
- *After booster chlorination* – where formation will have increased due to more available disinfectant.
- Low or no residual (i.e., relative to initial disinfectant levels) – likely advanced residence time.
- *Low water use in general* – lightly developed areas where water is allowed to age.
- *Areas with high historic TTHM levels* – systems cannot use Stage 1 DBPR sites for standard monitoring. Systems should be collecting new data, so they should locate sites where they are not already sampling.

High HAA5 Sites: Different systems may find high HAA5 sites in locations with different characteristics. HAA5 formation and decomposition seems to follow a pattern that is different from that of TTHM in the distribution system. While TTHM concentrations are generally highest at the points in the system with the longest residence times, research suggests that HAA5 seem to form and then decompose. The consumption of HAA5 by microorganisms is known as biodegradation, which is more likely to occur when disinfectant residual levels are low or non-existent, particularly in warmer months. Therefore, a high HAA5 site will not necessarily be the site with the longest residence time, and may even be at a site with shorter residence time. Systems should have started by examining their existing Stage 1 DBPR data to determine which areas tend to have higher HAA5 concentrations.

EPA or the state should verify that the system considered the more complex nature of HAA5 formation and degradation. They should have chosen sites where DBPs are expected to be high, but should differentiate between those sites expected to have high HAA5 versus those with high TTHM.

Biofilm degrades HAA, so pipes with biofilm build-up may have water with low levels of HAA. Areas of known biofilm growth should be avoided when choosing high HAA5 sites, although these sites may still be considered for high TTHM. HPC data may indicate where areas with biofilm build-up are located. Areas with difficulty maintaining a disinfectant residual (< 0.2 mg/L chlorine or < 0.5 mg/L chloramines) should also be avoided.

Sites should target areas with a low but detectable residual. This will indicate high residence time but a low likelihood of biodegradation. Good sites for HAA5 include:

- *After booster chlorination* – where formation will have increased due to more available disinfectant and where any biodegradation will be halted.

- *Low but detectable residual (i.e., relative to initial levels)* – likely advanced residence time but not sites likely to have biofilm.

- *Areas with high historic HAA5 levels* – however, keep in mind that the system cannot use Stage 1 DBPR sites for standard monitoring. The idea is to get more data, so systems want to locate sites where they are not already sampling.

- Other sites include:

  – *Tanks* – increased residence time.

  – *Dead ends* – low flows. However, do not sample stagnant water after the last customer. The purpose is to sample water that customers are consuming.

  – *Hydraulic dead ends and hydraulic mixing zones.*

  – *Low water use in general* – lightly developed areas where water is allowed to age.

Remember that high HAA5 sites must be independent of the high TTHM sites. Make sure the system did not count any sites as both high TTHM and high HAA5 sites and that the total number of required sites are selected.

Review Justifications for Adequacy

For high TTHM, high HAA5, and average residence time sites, EPA or the state will need to read the justifications and determine if they are adequate. The purpose of the justification is to explain to the reviewer why the site was selected. The information provided should convince the reviewer that the system considered all available data, understood their data analysis, and selected the most appropriate site given the information available. Examples of adequate and poor justification are provided in Example 3-3.

Example 3-3. Examples of Justification

Examples of Adequate Justifications

High TTHM site: Site #4 is at the extreme end of the distribution system, down gradient of a tank with a low turn-over rate. It is in a residential area with primarily 6-inch pipes and with chlorine residual ranging from 1.0 to 1.2 in the summer.

High HAA5 site: Site #6 is an area that has relatively high water age, but because it is down gradient of booster chlorination we do not anticipate biodegradation. Chlorine residuals are high at this site (approx 1.5 mg/L year round). It is on a 12-inch water main.

Examples of Poor Justifications

"Site #1 is a high TTHM site."
In this example, there is insufficient justification provided regarding why Site #1 is a high TTHM site.

"Site #3 is a high HAA5 site. Stage 1 DBPR site A has had high HAA5's, so we located standard monitoring site #3 right next to it."
This justification works against the need for geographic representation of sampling sites because the system is proposing two sites next to each other.

More examples are available in EPA's *IDSE Guidance Manual*.

Modifying and Approving a Standard Monitoring Plan

EPA or the state has 12 months after the submission deadline to complete the review of Standard Monitoring Plans.

All correspondence between the system and the reviewer should be included in the 12-month period and does not extend the ultimate approval deadline, unless the reviewer notifies the system that the plan is still under review. If EPA or the state has any concerns about a plan during the review, they can contact the system to ask for additional information or request modifications. When the system has not included enough information or when reviewing more complex systems, EPA or the state should discuss changes with the system. If EPA or the state determines, based on the new information, that the sites are appropriate, the additional information can be included in the Standard Monitoring Plan and the review completed. However, if the system is unable to provide adequate justification, EPA or the state should work with the system to select alternative sites.

EPA or the state should notify the system in writing when its plan is approved. After the review is completed and the plan has been approved, EPA or the state should send a copy to the system for its records. If changes were made after the original submission, EPA or the state should send a copy of the approved plan to the system for its records. If EPA is reviewing plans all correspondence and recordkeeping will be through the IPMC.

If the review is not completed within the 12-month period, EPA or the state must contact the system to let them know that the review requires additional time. All correspondence between the system and the reviewer is included in this 12-month period and does not extend the ultimate approval deadline.

If EPA or the state does not approve the system's plan within 12 months of the required submission date or notify the system that their review is not complete, the system can consider the plan approved and conduct standard monitoring as proposed in the plan.

States should be aware that approving the plan within 12 months is critical for enabling systems to meet their compliance deadlines. If EPA or a state is unable to approve the plan within this timeframe, they will need to provide the system with an alternate schedule for their standard monitoring (i.e., new sampling dates) and their IDSE Report.

3.11.2 IDSE Reports for Standard Monitoring

All systems that conduct standard monitoring must submit an IDSE Report [§141.601(c)] to the state. The primary purpose of the IDSE Report is to provide EPA or the state with the system's recommendations for where and at what frequency Stage 2 DBPR compliance monitoring will be conducted. In addition, the system must provide justification for these selections. When completing the IDSE Report, systems have the option of using the IDSE Report for Standard Monitoring Form (Form 5) in Appendix E.

EPA or the state may approve or modify the sites chosen by the system. The number and frequency of samples must comply with those presented in Table 3-17. Systems must follow the site selection protocol in this subsection unless they provide EPA or the state with adequate justification for alternate sites.

EPA or the state has a limited amount of time after the submission deadline to request modifications or approve the IDSE Report or contact the system to let them know that the review is not complete. The EPA or state deadlines for IDSE Reports approval, modification or notification are listed in Table 3-1. The deadlines are within 3 months of the submission deadline for systems on Schedules 1, 2 and 4, and within 9 months of the submission deadline for systems on Schedule 3. Note that this is 3 or 9 months from the submission deadline, not the actual date of submission. If the system does not receive approval or modification of the report, or notification that EPA or the state has not completed their review within that 3- or 9-month period, the system may consider the report approved as submitted and use the Stage 2 DBPR compliance monitoring sites recommended in the report.

If EPA or the state needs additional time for the review, they can contact the system within the 3 or 9 month period and let them know that the review requires additional time.

3.11.2.1 Review of Required Elements for Standard Monitoring IDSE Report

The basic elements required for the IDSE Report are listed in the checklist in Table 3-14.

Table 3-14. IDSE Report for Standard Monitoring, Required Elements Checklist

Check if Provided ☑	Required Element	Section in Form 7
☐	Explanation of any deviations from approved Standard Monitoring Plan	III & VII
☐	TTHM and HAA5 analytical results from Stage 1 DBPR monitoring and IDSE standard monitoring	III
☐	Recommendations and justification of Stage 2 DBPR compliance monitoring sites	IV

Check if Provided ☑	Required Element	Section in Form 7
☐	Proposed Stage 2 DBPR Compliance Monitoring Schedule	V.C
	If changed from the approved Standard Monitoring Plan:	
☐	• Distribution system schematic	VI
☐	• Population served by the system	I.A
☐	• Source water type (Subpart H or ground water)	I.A

If some of the required elements on the checklist in Table 3-14 are missing, EPA or the state should contact the system to request the missing information. If all boxes are checked, all required elements have been submitted.

3.11.2.2 Technical Review of Standard Monitoring IDSE Report

The purpose of the technical review of the IDSE Report is to ensure that:

- The system's recommended Stage 2 DBPR compliance monitoring locations are in accordance with the protocol set in §141.605, or
- That the system provided adequate justification for alternative locations, and
- That the system has chosen appropriate dates on which to sample for Stage 2 DBPR compliance.

In addition, EPA or the state should check the IDSE Report against the Standard Monitoring Plan to ensure that the system conducted standard monitoring in accordance with the approved plan. If the system deviated from the plan, it should have explained why changes were made. If no explanation was provided or if the justification for changes is not adequate, EPA or the state may want to contact the system for more information.

Site Selection for Compliance Monitoring

Systems must use the protocol in Table 3-15 to select their Stage 2 DBPR compliance monitoring sites using a combination of their Stage 1 DBPR data and data collected for the IDSE. If a system is required to select more than eight sampling sites it must return to the top of the protocol, each time selecting from those sites that have not already been identified for Stage 2 DBPR monitoring until the required number of sites has been selected. Examples of Stage 2 DBPR site selection using the protocol can be found in EPA's *IDSE Guidance Manual*.

If a system arrives at Step 3 or Step 7 and has no more Stage 1 DBPR sites to select from, the system should skip these steps and continue with the protocol as necessary, until it has identified the required total number of monitoring locations. This may happen if the Stage 1 DBPR sites have the highest TTHM or HAA5 LRAAs and were previously selected, if the system is a consecutive system and had little or no Stage 1 DBPR data, or if the system is very large but has few treatment plants. When this occurs, the correct total number of sites will be selected, but the distribution between TTHM, HAA5 and Stage 1 DBPR sites will be different than shown in Table 3-17.

Table 3-15. Protocol for Selecting Stage 2 DBPR Compliance Monitoring Sites

Steps[1] [required by rule]		Stage 2 Compliance Monitoring Sites Selected [2]
1	Select the location with the highest TTHM LRAA	1st highest TTHM site
2	Select the remaining location with the highest HAA5 LRAA	1st highest HAA5 site
3	For Subpart H systems: Select the remaining existing Stage 1 DBPR average residence time compliance monitoring location with the highest HAA5 LRAA For ground water systems: Select the remaining existing Stage 1 DBPR maximum residence time compliance monitoring location with the highest HAA5 LRAA *Skip this step if you have no more Stage 1 DBPR sites*	1st Stage 1 DBPR site
4	Select the remaining location with the next highest TTHM LRAA.	2nd highest TTHM site
5	Select the remaining location with the next highest TTHM LRAA	3rd highest TTHM site
6	Select the remaining location with the next highest HAA5 LRAA	2nd highest HAA5 site
7	For Subpart H systems: Select the remaining existing Stage 1 DBPR average residence time compliance monitoring location with the highest TTHM LRAA For ground water systems: Select the remaining existing Stage 1 DBPR maximum residence time compliance monitoring location with the highest TTHM LRAA *Skip this step if you have no more Stage 1 DBPR*	2nd Stage 1 DBPR site
8	Select the remaining location with the next highest HAA5 LRAA	3rd highest HAA5 site
If you need more Stage 2 DBPR compliance monitoring locations, Go back to Step 1 of this protocol and repeat the steps until you have selected the required number of total sites.		

1. All steps are based on calculated LRAAs for standard monitoring sites and Stage 1 DBPR compliance monitoring sites. This means that existing Stage 1 DBPR sites can be selected in steps *other than* 3 or 7. Systems will stop when they reach the required number of Stage 2 DBPR compliance monitoring sites.
2. Systems cannot select the same site as a highest TTHM and a highest HAA5 compliance monitoring site.

EPA or the state should review the IDSE Report to assure that the system followed the site selection protocol correctly. EPA or the state should check that the system used the correct type of Stage 1 DBPR site in Step 3 and Step 7, depending on the system's source type. If EPA or the state has concerns that the protocol was not properly followed, they should contact the system for more information.

Although the site selection protocol is designed to select Stage 2 DBPR compliance monitoring sites based on the highest LRAA, EPA recognizes that a slight difference between LRAAs measured at two sites may not be meaningful given the normal variability that may occur at a site over time. As a result, the selection of a Stage 2 DBPR compliance monitoring site with a slightly lower LRAA may be acceptable if other factors, such as those listed below, favor the site with the lower LRAA. It will be

important for EPA or the state to consider the system's justifications (see Example 3-4) to determine whether the goal of choosing representative high TTHM and HAA5 sites has been met.

- The system may want to choose an alternate site to provide for more complete geographic coverage of the entire distribution system.
- The system may want to choose a site at which it has been sampling for the Stage 1 DBPR over another site in order to maintain a historical record.
- Sampling at a particular site may provide the system with the opportunity to collect other water quality or operational data (e.g., systems using chloramines may want to collect nitrate data at that site).

Example 3-4. Example Rationale for Site Selection Outside of Protocol

Standard monitoring site #3 has the next highest TTHM LRAA at 0.043 mg/l. This site would be selected next based on the protocol, however, Stage 1 DBPR site #1 is in the same vicinity of the distribution system and the TTHM LRAA at this site is 0.041 mg/l which is only slightly lower. We have chosen to use Stage 1 DBPR Site #1 as the next Stage 2 DBPR site as we feel that it would be useful to maintain a historical record at this site.

Sampling schedule

As with the standard monitoring and SSS Plans, the IDSE Report will require systems to determine a "peak historical month" and then to set the remainder of the sampling months at regular frequencies from that month. Systems should use the same peak historical month determined in their Standard Monitoring Plan, unless new data indicate a different month is more appropriate. EPA or the state can evaluate the peak historical month using the criteria in section 3.11.1.4 and any new data collected during the IDSE.

EPA or the state should check the projected monitoring dates and confirm that monitoring is planned at least at the minimum frequency required by the rule (shown in Table 3-17). Note that a system does not have to sample at exactly the frequency specified for the system. Sampling within the same week during each required month is sufficient. For example, a system on quarterly monitoring could sample in the third week of every third month. Likewise, systems do not have to sample all locations on the same day, and can spread sampling out so long as they meet schedule requirements.

3.12 Stage 2 DBPR Compliance Monitoring Plan

All systems subject to Stage 2 DBPR must develop a Stage 2 DBPR Compliance Monitoring Plan [§141.622]. This plan is similar to the Stage 1 DBPR monitoring plan in that it will identify how systems intend to sample for compliance with the Stage 2 DBPR. Systems must prepare a plan prior to the date they are required to begin their Stage 2 DBPR compliance monitoring and must keep their plan on file for state and public review. In addition, by that same date, Subpart H system serving more than 3,300 people must submit their monitoring plan to EPA or the state.

The Compliance Monitoring Plan must include the following information:

- Monitoring locations.
- Monitoring dates.
- Compliance calculation procedures.

3.12.1 Systems that Submitted an IDSE Report

Systems that conducted standard monitoring or an SSS must have included the first two items, their monitoring locations and monitoring dates, in their IDSE Report. If these systems also included their compliance calculation procedures in their IDSE Report, then their IDSE Report can serve as their Compliance Monitoring Plan, and they will not need to submit a separate plan.

However, if a system that conducted standard monitoring or an SSS did not include all the information required for Compliance Monitoring Plan in their IDSE Report, they are required to prepare a Compliance Monitoring Plan. The Compliance Monitoring Plan must reflect recommendations of the IDSE Report and any state-mandated changes to the IDSE Report.

3.12.2 Systems that Did Not Submit an IDSE Report

Some systems subject to the Stage 2 DBPR are not required to submit an IDSE Report, and therefore they must prepare a Compliance Monitoring Plan. These systems are:

- Systems that qualified for a VSS Waiver.
- Systems that received a 40/30 Certification.
- Nontransient noncommunity systems serving fewer than 10,000 people.

In their Compliance Monitoring Plan, these systems must select their Stage 2 DBPR monitoring locations and dates and must discuss the compliance calculation procedures in their plan. Some of these systems can comply by updating their Stage 1 DBPR monitoring plan (i.e., identify additional locations for compliance monitoring by alternating locations with high TTHM and HAA5 levels until the required number of locations has been identified), which was developed under §141.132(f).

If a system has more Stage 1 DBPR sites than the number required for Stage 2 DBPR compliance monitoring, they must select sites by alternating between locations representing high TTHM and high HAA5 levels until the required number of Stage 2 DBPR compliance monitoring locations have been identified.

If a system has fewer Stage 1 DBPR sites than the number required by the Stage 2 DBPR, the system must begin by using the existing Stage 1 DBPR sites. They then must select additional locations by identifying sites in the distribution system with anticipated high DBP levels, alternating selection of locations representing high TTHM levels and high HAA5 levels, starting with high TTHM. The system must include the rationale for identifying locations as having high levels of TTHM or HAA5 in their plan. This process will be similar to the process used in selecting standard monitoring sites. The state may want to refer to section 3.11.2.2 for guidance on reviewing monitoring plans when the system had to identify additional sites.

3.12.3 Combined Distribution Systems the State has Decided to Treat as One System

The state may modify the Stage 2 DBPR compliance monitoring requirements by treating the systems in a combined distribution system as a single system to the extent that the interconnection of the systems justifies such modifications [§141.29]. This option is discussed in more detail in section 3.18.

3.12.4 Changes to a Monitoring Plan

If a system makes any changes in treatment, distribution system operations and layout, or other factors that may affect TTHM or HAA5 formation, these changes may warrant a modification to their monitoring locations. In this case the system must revise their Compliance Monitoring Plan. The system must consult with the state regarding the need for the changes and the most appropriate modifications. The revised sites must replace existing compliance monitoring locations with expected high TTHM or HAA5 levels.

Modifications to the Compliance Monitoring Plan may be initiated by the system, or the state may require the modifications. If the state becomes aware of major system changes (in the process of review of plans and specifications or during technical assistance, sanitary survey, or other system site visit), the state should consider if these system changes have a likelihood of affecting relative DBP levels in the distribution system.

System changes that may warrant modifications to a systems' monitoring plan may include:

- Adding or removing a source.
- Adding or removing a booster chlorination site
- Adding or removing a storage tank.
- Adding a new service area.
- Changes to the primary or residual disinfectant site or type (but only if the change is expected to impact relative DBP levels in the distribution system).

3.12.5 Reporting and Recordkeeping Requirements for Compliance Monitoring Plan

All systems must keep their Stage 2 DBPR Compliance Monitoring Plan (or their IDSE Report if it serves as their monitoring plan) on file for state and public review.

Subpart H systems serving more than 3,300 people are also required to submit copies of their monitoring plan or any modified monitoring plan to the state before they begin compliance monitoring.

3.13 Stage 2 DBPR Compliance Monitoring Deadlines

Table 3-16 summarizes the deadlines for Stage 2 DBPR for TTHM and HAA5 compliance monitoring [§141.620(c)]. Systems required to conduct quarterly monitoring must begin monitoring in the first full calendar quarter that includes the compliance deadline. If the system is required to conduct monitoring at a frequency that is less than quarterly, it must begin monitoring in the calendar month recommended in the IDSE Report, or in the monitoring plan if the IDSE Report does not specify a month. Monitoring must begin no later than 12 months after the compliance date in Table 3-16.

Since compliance monitoring deadlines for each schedule are more than 3 years after the system submitted their IDSE Report, states may want to consider sending reminders to systems in the quarter prior to the compliance deadline. These reminders could reiterate that the system will be switching from their Stage 1 DBPR monitoring locations and dates to the new Stage 2 DBPR locations and dates, and that compliance will then be based on the LRAA rather than the RAA.

Table 3-16. Compliance Schedule for Stage 2 DBPR TTHM and HAA5 Monitoring

Requirement	Compliance dates by PWS size (retail populations served)[1]				
	CWSs and NTNCWSs serving at least 100,000	**CWSs and NTNCWSs serving 50,000-99,999**	**CWSs and NTNCWSs serving 10,000-49,999**	**CWSs serving <10,000**	**NTNCWSs serving <10,000**
Begin Stage 2 DBPR Compliance Monitoring[2]	April 1, 2012	October 1, 2012	October 1, 2013	October 1, 2013 (October 1, 2014 if *Crypto-sporidium* monitoring is required under Subpart W.)	October 1, 2013 (October 1, 2014 if *Crypto-sporidium* monitoring is required under Subpart W.)

1. Wholesale and consecutive systems that are part of a combined distribution system must comply based on the schedule required of the largest system in the combined distribution system.
2. States may grant up to 2 years for systems making capital improvements. See Appendix I for guidance on reviewing extension requests under Section 1412(b)(10) of the SDWA.

3.13.1 System Requests for Compliance Schedule Extensions

Under Section 1412(b)(10) of the SDWA, the state may grant up to a 2-year extension on a system-by-system basis for systems requiring capital improvements to meet Stage 2 DBPR. Beginning April 1, 2006, systems must comply with the Stage 2 DBPR LRAA MCLs for TTHM and HAA5 within 6 to 8.5 years but, with a 2-year extension, could have 8 to 10.5 years to comply.

States should consider requiring the system to enter into an extension agreement, with construction milestones and interim activities that the system will undertake to protect public health during this extension period. States may wish to develop information and procedures on the specific content of the extension request and consider developing and providing forms or templates for the system's use. See Appendix I for guidance on reviewing extension requests under Section 1412(b)(10) of the SDWA.

3.14 Stage 2 DBPR Routine Monitoring

3.14.1 TTHM and HAA5

Table 3-17 shows the Stage 2 DBPR routine compliance monitoring requirements for TTHM and HAA5 [§141.621].

Subpart H systems serving more than 3,300 people and ground water systems serving 10,000 or more people are required to collect dual samples (monitoring for both TTHM and HAA5) at each monitoring location. Subpart H systems, serving 3,300 and fewer people and ground water systems serving fewer than 10,000 people systems can collect one sample at each site. These systems will collect a TTHM

sample at the site identified as a high TTHM site and an HAA5 sample at the site identified as a high HAA5 site. If one site is identified as high for both TTHM and HAA5, one dual sample may be taken at this site.

All systems must sample during the month of highest DBP formation.

Table 3-17. Stage 2 DBPR Routine Compliance Monitoring Requirements

Source Water Type	Population Size Category	Monitoring Frequency [1]	Distribution System Monitoring Location Total per Monitoring Period [2]
Subpart H	<500	per year	2
	500-3,300	per quarter	2
	3,301-9,999	per quarter	2
	10,000-49,999	per quarter	4
	50,000-249,999	per quarter	8
	250,000-999,999	per quarter	12
	1,000,000-4,999,999	per quarter	16
	≥ 5,000,000	per quarter	20
Ground Water	<500	per year	2
	500-9,999	per year	2
	10,000-99,999	per quarter	4
	100,000-499,999	per quarter	6
	≥ 500,000	per quarter	8

1. All systems must take at least one dual sample set during the month of highest DBP concentrations.
2. Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for Subpart H systems serving 500-3,300. Systems on annual monitoring and Subpart H systems serving 500-3,300 are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location (and month, if monitored annually).

3.14.2 Bromate and Chlorite Monitoring

CWSs and NTNCWSs using ozone are required to conduct bromate monitoring. The MCL for bromate for systems using ozone remains 0.010 mg/L (measured as an RAA) for samples taken at the entrance to the distribution system as established by the Stage 1 DBPR.

The criterion, however, for a system using ozone to qualify for reduced bromate monitoring has changed from demonstrating low levels of bromide in the source water, a precursor to bromate when ozonation is used, to demonstrating low levels of bromate in the finished water. Under the Stage 2 DBPR, reduced monitoring criteria are based on the bromate RAA of 0.0025 mg/L or less [§141.132(b)(3)(ii)]. New analytical methods that are more sensitive than older methods have become available, allowing bromate to measured to levels of 0.001 mg/L or lower. The Stage 1 DBPR requirements are effective until March

31, 2009, after which time systems must meet the requirements included in the Stage 2 DBPR (see section 3.15.2 for information on reduced bromate monitoring).

Additionally, EPA has reduced the MRL for chlorite to 0.020, based on approved analytical methods for determining compliance with the chlorite MCL [§141.131]. EPA recognizes that numerous PWSs have been obtaining data on low concentrations and have been using the data in their CCRs. Setting the MRL at 0.020 mg/L is reflective of current laboratory practices and current data expectations by water systems. This change does not affect the system monitoring or compliance with the chlorite MCL established under the Stage 1 DBPR.

3.15 Stage 2 DBPR Reduced Monitoring

3.15.1 Reduced TTHM and HAA5 Monitoring

The criteria to qualify for reduced TTHM and HAA5 monitoring remain consistent with those included in the Stage 1 DBPR. Systems may qualify for reduced monitoring if:

- TTHM LRAA at each monitoring location is no more than 0.040 mg/L.
- HAA5 LRAA at each monitoring location is no more than 0.030 mg/L.
- The annual average TOC level at each treatment plant is 4.0 mg/L or less for Subpart H systems (discussed in more detail below).

  [§141.623]

Note that reduced monitoring is not allowed on a location-by-location basis. All sites must meet the criteria in order for the system to reduce monitoring.

Systems required to monitoring quarterly under routine monitoring must continue to meet these criteria in order to remain on reduced monitoring. For systems on annual or less frequent routine monitoring the LRAAs for TTHM and HAA5 must remain no higher than 0.060 mg/L and 0.045 mg/L, respectively and Subpart H systems must continue to meet the TOC criteria.

If reduced monitoring results indicate that a system is no longer eligible for reduced monitoring, the system must resume routine monitoring the quarter immediately following the monitoring period in which the system exceeded the specified levels for reduced monitoring.

If a system that is required to monitor annually or less frequently on routine monitoring exceeds the TTHM and HAA5 MCL, this system must go to increased monitoring in the quarter immediately following the monitoring period in which the system exceeded the MCL.

The state may also use its discretion to return a system to routine monitoring.

3.15.1.1 Source Water TOC for Reduced Monitoring for DBPs

The Stage 2 DBPR specifies a sampling frequency for all systems taking TOC source water samples. Beginning April 1, 2008 (unless the state specifies an earlier date), systems must take TOC samples every 30 days at a location prior to treatment to qualify for reduced monitoring [§141.132(b)(1)(iii)]. These samples must be averaged quarterly for the most recent 4 quarters, which are used to calculate an RAA. If

the system's RAA for TOC is 4.0 mg/L or lower and it meets the criteria listed in section 3.16.1.1 for TTHM and HAA5, then the system qualifies for reduced DBP monitoring.

Systems on a reduced Stage 1 DBPR monitoring schedule will need to conduct Stage 2 DBPR compliance monitoring on a routine monitoring schedule until they have collected sufficient TOC data to qualify for reduced monitoring.

Once the system is on reduced monitoring, it can reduce its TOC monitoring to every 90 days to remain on reduced monitoring.

Table 3-18. Stage 2 DBPR Reduced Monitoring Requirements for All Systems

Source Water Type	Population Size Category	Monitoring Frequency [1]	Distribution System Monitoring Location per Monitoring Period
Subpart H	<500	-	monitoring may not be reduced
	500-3,300	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	3,301-9,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement
	10,000-49,999	per quarter	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs
	50,000-249,999	per quarter	4 dual sample sets - at the locations with the two highest TTHM and two highest HAA5 LRAAs
	250,000-999,999	per quarter	6 dual sample sets - at the locations with the three highest TTHM and three highest HAA5 LRAAs
	1,000,000-4,999,999	per quarter	8 dual sample sets - at the locations with the four highest TTHM and four highest HAA5 LRAAs
	≥ 5,000,000	per quarter	10 dual sample sets - at the locations with the five highest TTHM and five highest HAA5 LRAAs
Ground Water	<500	every third year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	500-9,999	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.

Source Water Type	Population Size Category	Monitoring Frequency [1]	Distribution System Monitoring Location per Monitoring Period
	10,000-99,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
	100,000-499,999	per quarter	2 dual sample sets; at the locations with the highest TTHM and highest HAA5 LRAAs.
	≥ 500,000	per quarter	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs

1. Systems on quarterly monitoring must take dual sample sets every 90 days.

3.15.1.2 Remaining on Reduced Monitoring based on Stage 1 DBPR

Systems that were on reduced monitoring for TTHM and HAA5 under Stage 1 DBPR may remain on reduced monitoring under Stage 2 DBPR if they meet all of the following criteria:

- They received a VSS Waiver or 40/30 Certification for IDSE.
- They meet the reduced monitoring criteria under Stage 2 DBPR.
- They will be monitoring at the same locations for Stage 2 DBPR as they did for Stage 1 DBPR.

If the system was required to identify additional Stage 2 DBPR sites or select a fewer number of Stage 2 DBPR sites compared to their Stage 1 DBPR sampling, they may not remain on reduced monitoring and must begin routine monitoring as outlined in 3.14. Systems can regain their reduced monitoring status once reduced monitoring criteria under Stage 2 DBPR are met.

3.15.2 Reduced Monitoring for Bromate

CWSs and NTNCWSs using ozone are required to conduct bromate monitoring. The MCL for bromate for systems using ozone remains 0.010 mg/L (measured as an RAA) for samples taken at the entrance to the distribution system as established by the Stage 1 DBPR. However, the criterion for a system using ozone to qualify for reduced bromate monitoring has changed from demonstrating low levels of bromide in the source water to demonstrating low levels of bromate in the finished water. Bromide is the precursor for bromate when ozonation is used. Under the Stage 2 DBPR, reduced monitoring criteria are based on the bromate RAA of 0.0025 mg/L or less [§141.132(b)(3)(ii)]. New analytical methods, that are more sensitive than older methods, have become available allowing bromate to be measured to levels of 0.001 mg/L or lower. The Stage 1 DBPR requirements are effective until March 31, 2009, after which time systems must meet the requirements included in the Stage 2 DBPR.

Under the Stage 2 DBPR, systems must have 1 year of data with bromate samples analyzed under a new analytical method to qualify for reduced bromate monitoring, now that more sensitive bromate methods are available. Beginning April 1, 2009, systems must have a bromate RAA of 0.0025 mg/L or less based on 1 year of monthly data to qualify for reduced bromate monitoring. Therefore, systems sampling for bromate under the Stage 1 DBPR will need to collect new data to qualify for reduced monitoring under the Stage 2 DBPR. These systems may choose to stop monitoring for bromide in March 2008 and begin monthly monitoring for bromate using an approved analytical method. This will enable systems to qualify for reduced bromate monitoring on April 1, 2009, if their RAA based on their bromate data is 0.0025 mg/L or less.

After qualifying for reduced monitoring, systems may remain on reduced monitoring if they continue to have a bromate RAA of 0.0025 mg/L or lower. If their RAA exceeds 0.0025 mg/L, the system must return to routine bromate monitoring the following month under §141.132(b)(3)(i).

3.16 Stage 2 DBPR Increased Monitoring

If a system monitors annually or less frequently than annually (on routine or reduced monitoring), they will be required to increase monitoring to dual sample sets taken quarterly (taken every 90 days) if:

- Any TTHM sample at any location exceeds 0.080 mg/L, or
- Any HAA5 sample at any location exceeds 0.060 mg/L.

[§141.625]

Note that this requirement is based on each individual sample. Also, increased monitoring is required on a system-wide basis. If any site meets the criteria, the system must increase monitoring at all sites.

Systems on quarterly monitoring are not subject to increased monitoring.

A system may return to routine monitoring if the TTHM LRAA for every monitoring location is less than or equal to 0.060 mg/L and the HAA5 LRAA for every monitoring location is less than or equal to 0.045 mg/L after conducting at least four consecutive quarters of increased monitoring.

Systems on Increased Monitoring Under Stage 1 DBPR [40 CFR 141.628]

Systems that were on an increased Stage 1 DBPR monitoring schedule must begin Stage 2 DBPR monitoring on the increased schedule until they meet the requirements for returning to the routine schedule.

When states are reviewing IDSE Reports and/or Compliance Monitoring Plans for systems on increased monitoring, they should make the system aware of this requirement. The standard monitoring or SSS Plan or IDSE Report should either show the additional monitoring dates, or the state should consider modifying the standard monitoring or SSS Plan or IDSE Report to indicate that unless the system achieves routine monitoring prior to the Stage 2 DBPR compliance monitoring date, the increased monitoring requirements must be met. In addition, systems that are put on an increased schedule in the interim period between the IDSE and compliance monitoring periods should be made aware of this requirement.

3.17 Operational Evaluations [40 CFR 141.626]

TTHM and HAA5 MCL compliance for the Stage 2 DBPR is based on an LRAA, therefore a system may have individual DBP results significantly higher than the MCL from time to time while remaining in compliance. This situation is a result of the fact that high concentrations are averaged with lower concentrations at a given location. While this situation does not constitute an MCL violation, it might indicate a trend that could lead to an MCL violation in future quarters.

3.17.1 Operational Evaluation Level

The “operational evaluation level” is an LRAA threshold, meant to help systems identify if they are in danger of exceeding the MCL in the following monitoring quarter. The process is useful in that it alerts

the system to the potential of an MCL violation if DBP levels remain at their current level and encourages them to consider what operational changes may be necessary to reduce DBP levels.

The operational evaluation level at any location is the sum of the two previous quarters' TTHM or HAA5 results plus twice the current quarter's TTHM or HAA5 result, divided by four to determine an average. Effectively, it is the LRAA that can be expected if the next quarter's result is the same as the current quarter's result. To determine if a system has exceeded operational evaluation levels at any sampling location, the following formula is used:

If $(Q_1 + Q_2 + 2Q_3)/4 >$ MCL at any monitoring location,

where
Q_3 = current quarter measurement
Q_2 = previous quarter measurement
Q_1 =quarter before previous quarter measurement
MCL=Stage 2 DBPR MCL for TTHM (0.080 mg/l) **or** Stage 2 DBPR MCL for HAA5 (0.060 mg/L)

then the system must conduct an operational evaluation.

If the operational evaluation level for TTHM exceeds 0.080 mg/L or the operational evaluation level for HAA5 exceeds 0.060 mg/L at any monitoring location, an exceedance of the operational evaluation level has occurred.

3.17.2 Operational Evaluations

If a system, including a consecutive system, exceeds the operational evaluation level, they must conduct an operational evaluation and submit a written report of the evaluation to the state no later than 90 days after receipt of the analytical result that caused the exceedance. The written report must be made available to the public upon request.

The operational evaluation must include an examination of system treatment and distribution operational practices. It must include storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation. It must then identify opportunities to reduce DBP concentrations in the distribution system and steps that could be considered to minimize future exceedances.

State review of the operational evaluations submitted by systems should address whether the system has identified the probable reason for the exceedance and considered what actions could be taken to avoid an MCL exceedance as well as to avoid the problem from arising in the future. If the exceedance is related to a seasonal or on-going issue, the state should consider whether the system is adequately addressing the problem to eliminate the cause rather than accepting it as a periodic event.

The exceedance may be rooted in source water issues, treatment processes, distribution system configuration or operation, or a combination of any or all of these components. The evaluation should consider the system holistically as well as examining specific areas of concern.

Below is a brief discussion of some issues and possible actions that the state may consider in conducting their reviews. However, for a more complete discussion of operational evaluations, refer to EPA's

Operational Evaluation Guidance Manual (formerly titled the *Significant Excursions Guidance Manual*) available online at www.epa.gov/safewater/disinfection/stage2/compliance.html#pws.

Source water management

Systems that experience an exceedance of the operational evaluation level may want to begin the evaluation by examining source water data and source management practices. Systems that have multiple water sources will need to determine which sources were in use at and just prior to the operational evaluation level exceedance and which source(s) likely influenced the location at which the exceedance occurred.

The evaluation should address any available source water precursor concentrations (including TOC, dissolved organic carbon (DOC), specific ultraviolet absorbance (SUVA)) and review these data during the time period that would have most impacted distribution system TTHM and HAA5 levels. A comparison of historical concentrations to the concentrations prior to the exceedance may show if the system experienced a sudden increase in these concentrations which may have resulted in the exceedance. Many of the factors that contribute to DBP precursors in source waters also affect turbidity and particle counts. Therefore, increased turbidity levels can serve as an indicator of an event that may have resulted in increased DBP precursors in the source water.

If such an increase is identified, the system should further examine other watershed or operational data to determine the cause of the increase in DBP precursors. Seasonal issues such as heavy rainfall or snow melt, algae bloom, spring or fall turnover, exceptionally high flows, exceptionally low flows, or another major event in the watershed might have impacted precursor concentrations and caused the exceedance.

If the issue is identified as a source problem, the system may consider a variety of actions to help prevent future exceedances. If the source has dramatic seasonal variations in water quality due to issues such as temperature, algae blooms, runoff, or spring and fall turn over, the system may consider relying more heavily on a groundwater source or a higher quality surface water source to supplement a poorer quality surface water supply during high DBP periods. This can be a valuable strategy to reduce DBP levels that may spike during certain seasons. Another option to address some of these seasonal issues is construction of a multiple level intake. Drawing from a lower level during an algae bloom, or a higher level during seasonal turn over can help a system avoid DBP spikes.

Treatment plant operation

The evaluation should also examine treatment data and processes during the time period that would have most impacted distribution system TTHM and HAA5 levels.

The report may include a review of finished water data collected prior to the operational evaluation level exceedance to help focus the evaluation. Key parameters to review include provide useful information on what factors may have contributed to increased DBP levels include:

- DBP Precursors Levels (TOC, SUVA, DOC, Bromide)
- pH
- Temperature
- Turbidity
- Disinfectant Concentration
- TTHM and HAA5 Concentrations

The evaluation should address treatment issues that impact both precursor removal and disinfectant practices. Some possible factors that may have contributed to the exceedance include:

- Substantial increase or decrease in flows to treatment components.
- Substantial changes in plant flow rate that may have resulted in a decrease in settling time or carry-over of process solids.
- Changes in chemical feed rate or coagulation practices.
- Maintenance activities in the plant that may have caused solids (and correspondingly precursors) carry over to the point of disinfectant addition.
- The addition or removal of any treatment processes.
- Poor regulation or failure of chemical feed system.
- Changes in primary disinfectant type or dose.
- Changes in flows to the clearwell or temperature in clearwell.
- Poorly controlled or excessive disinfectant dose.

If the system determines that the primary issue that caused the exceedance is related to treatment, they will want to examine how the plant can optimize precursor removal and/or disinfection practices to avoid an MCL exceedance and future operational evaluation level exceedances. Prior to any change in disinfection practices systems should (and systems subject to the LT2WSWTR are required to) conduct disinfection profiling and benchmarking and consult with the state about proposed changes.

Distribution system infrastructure or operations

Finally, the evaluation should address the distribution system and examine distribution data and operational practices to determine the cause of the operational evaluation level exceedance. The system should gather distribution system monitoring and operations data that reflect conditions just prior to and during the time of the operational evaluation level exceedance. Types of information that could be useful include:

- Temperature data
- Disinfectant residual data
- Pump station and storage facility operating data (e.g., tank level data)
- Meter data (to determine if demand was lower than normal)
- Residual data
- Maintenance records (planned and emergency)
- Customer complaint records

Some factors to consider in evaluating if the exceedance was caused by actions or practices in the distribution system include:

- Unusually low system demand (including drop in use of a high-volume user) causing an increase in water age.
- Unusually high demand or event that could cause a tank or reservoir to be drawn down more than usual, drawing stagnant water from the tank.
- Maintenance events such as cleaning of a tank, repair of a water main, or water main flushing.
- Change of the pattern of flow through the distribution system that may allow older water from stagnant zones to be drawn into other areas of the distribution system where water use is higher.

If the evaluation indicates that the primary factor that caused the exceedance of the operational evaluation level is related to distribution system issues, the system will examine steps that may be taken to address these issues. Changes to tank configuration or operation to minimize hydraulic residence time and/or maximize mixing should be considered including modification to inlet configuration, cut in and cut out levels, longer fill time, higher inlet velocity, or mixing to avoid thermal stratification. Some other distribution system remedies may include looping dead end mains, periodic flushing of high water age portions of the distribution system, downsizing oversized pipe, and cleaning and lining cast or ductile iron pipe to reduce chlorine demand.

3.17.3 Evaluate System Requests for Limiting the Scope of an Operational Evaluation

If the system is readily able to identify the cause of the operational evaluation level exceedance, it may request permission to limit the scope of the evaluation. If the request is granted by the state, the system still must follow the schedule for completing the evaluation and submitting the report. The state must approve the limited scope in writing, and the system must keep the approval with the completed report.

States may want to encourage systems to contact them after an exceedance to discuss next steps and to determine whether they qualify to limit the scope of their evaluation.

3.18 Special Considerations for Consecutive and Wholesale Systems

3.18.1 DBP Monitoring

The TTHM and HAA5 sampling requirements for consecutive systems are determined in the same manner as for all other systems. The number of sites and monitoring frequency is based on the system's population served and source type (based on wholesale system's source water type). Thus, large consecutive systems will take more samples than a smaller wholesale system.

3.18.2 Treating Combined Distribution Systems as One System for Compliance Monitoring

As discussed in 3.12.3, §141.29 gives the state the authority to treat systems in a combined distribution system as a single system with respect to their monitoring requirements as long as the interconnection of

the systems justifies such modifications. If the state elects to use this authority to modify one or more systems' Stage 2 DBPR compliance monitoring requirements, the rule requires the following:

- The state must describe in their primacy application a procedure for implementing this process (see section 4).
- The state must require that each system have at least one monitoring site.
- Each system must submit the monitoring plans for all other systems in the combined distribution system along with their monitoring plan.

The state may want to consider encouraging all systems in the combined distribution system to submit their plans at the same time.

3.18.3 BATs

Compliance with the Stage 2 DBPR can be especially challenging for consecutive systems. If a wholesale system has DBP issues, it is likely to focus on precursor removal. However, this option is not available to consecutive systems that receive treated water. If a consecutive system receives treated water that contains high DBPs and/or high levels of precursors and disinfectants, they have limited options for controlling DBPs.

Therefore, the Stage 2 DBPR provides best available technologies (BATs) for consecutive systems, which are not focused on precursor removal. For all systems, the management of hydraulic flow and storage to minimize residence time in the distribution system is a BAT. For larger systems (those serving at least 10,000 people) chloramination is also a BAT.

3.18.4 Chlorine and Chloramines Requirements

Consecutive systems that do not add a disinfectant but deliver water that has been treated with a disinfectant other than UV must now comply with the Stage 1 DBPR analytical and monitoring requirements for chlorine and chloramines and associated compliance requirements and reporting requirements including:

- Analytical methods [§141.131(c)].
- Monitoring of residual at the same sites as total coliform sampling [§141.132(c)(1)].
- Compliance with the MRDL [§141.133(c)(1)].
- Reporting of results [§141.134(c)].

These requirements begin April 1, 2009 unless required earlier by the state [§141.624]

3.18.5 Additional Resources

EPA is preparing a guidance manual for consecutive systems to address these and other issues.

3.19 State Recordkeeping Requirements

Section 142.14 requires states with primacy to keep various records, including:

- Analytical results to determine compliance with MCLs, MRDLs, and treatment technique requirements.
- System inventories.
- State approvals.
- Enforcement actions.
- Issuance of variances and exemptions.

The Stage 2 DBPR requires that the state keep records related to any decisions made pursuant to IDSE requirements and Stage 2 DBPR requirements. States also must retain copies of IDSE monitoring plans and 40/30 Certifications, including any modifications required by the state, until they are replaced or revised in their entirety. States must keep operational evaluations for 10 years.

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Section 4

State Primacy Revision Application

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40 CFR Part 142 sets out requirements for states to obtain and/or retain primary enforcement responsibility (primacy) for the Public Water System Supervision (PWSS) program as authorized by Section 1413 of the SDWA. The 1996 SDWA Amendments updated the process for states to obtain and/or retain primacy. On April 28, 1998, EPA promulgated the Primacy Rule to reflect these statutory changes (63 *FR* 23361).

4.1 State Primacy Program Revision

Pursuant to §142.12, Revision of State Programs, complete and final requests for approval of program revisions to adopt new or revised EPA regulations must be submitted to the EPA Administrator no later than 2 years after promulgation of the new or revised federal regulations (see Table 4-1). Until those applications are approved, EPA regions have responsibility for directly implementing the Stage 2 DBPR. The state and EPA can agree to implement the rule together during this period. However, if a state is eligible for interim primacy, it will have full implementation and enforcement authority. States that have primacy for all existing NPDWRs are considered to have interim primacy for any new or revised regulation. Interim primacy for the Stage 2 DBPR would begin on the date the final and complete primacy revision application is submitted or the effective date of the new state regulation (whichever is later), and ends when EPA makes a final determination.

A state may be granted an extension of time, up to 2 years, to submit its application package. During any extension period, an extension agreement outlining the state's and EPA's responsibilities is required.

Table 4-1. State Rule Implementation and Revision Timetable for the Stage 2 DBPR

EPA/State Action	Time Frame
Rule published by EPA	January 4, 2006
State and region establish a process and agree upon a schedule for application review and approval (optional)	March 4, 2006
State, at its option, submits *draft* program revision package to region including: Preliminary Approval Request, Draft State Regulations and/or Statutes, Regulation Crosswalk	July 4, 2006 (Recommended)
Regional (and Headquarters if necessary) review of draft	Completed within 90 days of state submittal of draft (Recommended)
State submits complete and final program revision package to region including: Adopted State Regulations Regulation Crosswalk §142.10 Primacy Update Checklist §142.14 and §142.15 Reporting and Recordkeeping §142.16 Special Primacy Requirements Attorney General's Enforceability Certification	January 4, 2008*
States with approved extensions submit complete and final program revision package	January 4, 2010**

EPA/State Action	Time Frame
EPA final review and determination: Regional Review (program and ORC) Headquarters Concurrence and Waivers (Office of Ground Water and Drinking Water (OGWDW)) Public Notice Opportunity for Hearing EPA's Determination	Completed within 90 days of state submittal of final package (45 days region) (45 days Headquarters)***

* EPA suggests submitting an application by October 4, 2007 to ensure timely approval. EPA regulations allow states until January 4, 2008 for this submittal.
** EPA suggests submitting an application by October 4, 2010 for states with approved extensions to ensure timely approval.
*** At least one state application per region.

4.1.1 The Revision Process

EPA recommends a two-step process for approval of state program revisions. The steps consist of submission of a draft request (optional) and submission of a complete and final request for program approval. Figure 4-1 diagrams these processes and their timing.

Draft Request—The state may submit a draft request for EPA review and tentative determination. The request should contain drafts of all required primacy application materials (with the exception of a draft Attorney General's Statement). A draft request should be submitted as soon as practicable; EPA recommends submitting it within 6 months of rule promulgation. EPA will make a tentative determination as to whether the state program meets the applicable requirements. EPA intends to make a tentative determination within 90 days.

Complete and Final Request—This submission must be in accordance with §142.12(c)(1) and (2) and include the Attorney General's statement. The state should also include its response to any comments or program deficiencies identified in the tentative determination (if applicable). Submission of only a final request may make it more difficult for states to address any necessary changes within the allowable time for state rule adoption.

EPA recommends that states submit their complete and final revision package within 21 months of rule promulgation (by October 4, 2008). This will ensure that states will have interim primacy as soon as possible and will prevent backlogs of revision applications to adopt future federal requirements.

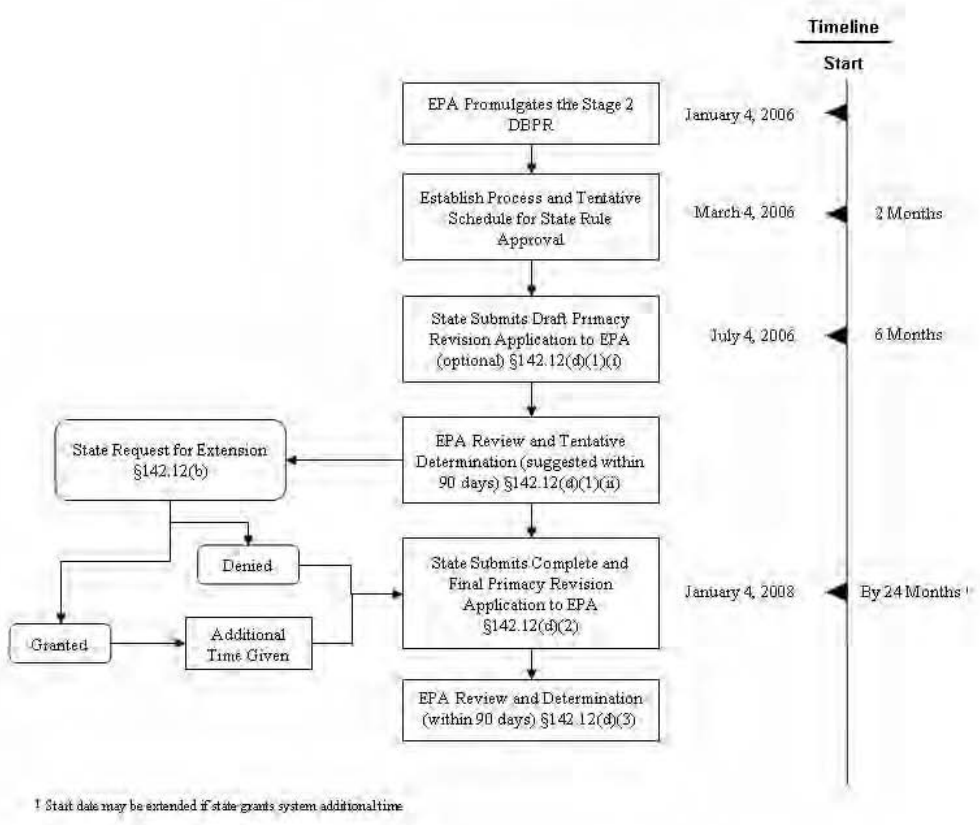
The state and region should agree to a plan and timetable for submitting the state primacy revision application as soon as possible after rule promulgation—ideally within 5 months of promulgation.

4.1.2 The Final Review Process

Once a state application is complete and final, EPA has a regulatory (and statutory) deadline of 90 days to review and approve or disapprove the revised program. OGWDW will conduct a detailed concurrent review of the first state package from each region. The regional office should submit its comments with the state's package within 45 days for review by Headquarters (HQ). When the region has identified all significant issues, OGWDW waives concurrence on all other state programs in that region, although EPA HQ retains the option to review additional state programs as appropriate. The Office of General Counsel (OGC) has delegated its review and approval to the Office of Regional Counsel (ORC).

In order to meet the 90-day deadline for packages undergoing review by HQ, the review period is equally split by giving the regions and HQ 45 days each to conduct their respective reviews. For the first package in each region, regions should forward copies of the primacy revision applications and their evaluations to the Drinking Water Protection Division Director in OGWDW no later than 45 days after state submittal. The Drinking Water Protection Division Director takes the lead on the HQ review process.

Figure 4-1. Recommended Review Process for State Request for Approval of Program Revisions



4.2 State Primacy Program Revision Extensions

4.2.1 The Extension Process

Under §142.12(b), states may request that the 2 year deadline for submitting the complete and final packages for EPA approval of program revisions be extended for up to 2 additional years in certain circumstances. The extension request must be submitted to EPA within 2 years of the date that EPA published the regulation. The Regional Administrator has been delegated authority to approve extension applications. Concurrence by HQ on extensions is not required.

Therefore, the state must either adopt regulations pertaining to the Stage 2 DBPR and submit a complete and final primacy revision application or request an extension of up to 2 years by January 4, 2008.

4.2.2 Extension Request Criteria

For an extension to be granted under §142.12(b), the state must demonstrate that it is requesting the extension because it cannot meet the original deadline for reasons beyond its control and despite a good faith effort to do so. A critical part of the extension application is the state's proposed schedule for submission of its complete and final request for approval of a revised primacy program. The application must also demonstrate at least one of the following:

(i) That the state currently lacks the legislative or regulatory authority to enforce the new or revised requirements;

(ii) That the state currently lacks the program capability adequate to implement the new or revised requirements; or,

(iii) That the state is requesting the extension to group two or more program revisions in a single legislative or regulatory action.

In addition, the state must be implementing the EPA requirements to be adopted in its program revision within the scope of its current authority and capabilities.

4.2.3 Conditions of the Extension

Until the State Primacy Revision Application has been submitted, the state and EPA regional office will share responsibility for implementing the primary program elements as indicated in the extension agreement. The state and the EPA regional office should discuss these elements and address terms of responsibility in the agreement.

These conditions will be determined during the extension approval process and are decided on a case-by-case basis. The conditions must be included in an extension agreement between the state and the EPA regional office.

Conditions of an extension agreement may include:

- Informing PWSs of the new EPA (and upcoming state) requirements and the fact that the region will be overseeing implementation of the requirements until they approve the state program revisions or until the state submits a complete and final revision package if the state qualifies for interim primacy.

- Collecting, storing, and managing laboratory results, public notices, and other compliance and operation data required by the EPA regulations.

- Assisting the region in the development of the technical aspects of enforcement actions and conducting informal follow-up on violations (e.g., telephone calls, letters).

- Providing technical assistance to PWSs.

- For states whose request for an extension is based on a current lack of program capability adequate to implement the new requirements, taking steps agreed to by the region and the state to remedy the deficiency during the extension period.

- Providing the region with all the information required under §142.15 for state reporting.

Example 4-1 provides a checklist the region can use to review state extensions or to create an extension agreement.

Until states have primacy, EPA is the primacy enforcement authority. However, historically states have played a role in implementation for various reasons—most importantly, since states have the local knowledge and expertise and have established relationships with their systems.

The state and EPA should be viewed as partners in this effort, working toward two very specific public health-related goals. The first goal is to achieve a high level of compliance with the regulation. The second goal is to facilitate efficient co-regulation during the transition period before the state has primacy, including interim primacy, for the rule. In order to accomplish these goals, education, training, and technical assistance will need to be provided to water suppliers on their responsibilities under the Stage 2 DBPR.

Example 4-1. Example Extension Request Checklist

{Date}

{Regional Administrator}
Regional Administrator
U.S. EPA Region **{Region}**
{Street Address}
{City, State, Zip}

RE: Request/approval for an Extension Agreement

Dear **{Regional Administrator}**:

The State of **{State}** is requesting an extension to the date that the final primacy revisions are due to EPA for the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) {**insert date - no later than January 4, 2010**}, as allowed by 40 CFR 142.12, and would appreciate your approval. Staff of the **{State Department/Agency}** have conferred with your staff and have agreed to the requirements listed below for this extension. This extension is being requested because the State of **{State}**:

☐ Is planning to group two or more program revisions into a single legislative or regulatory action.
☐ Currently lacks the legislative or regulatory authority to enforce the new or revised requirements.
☐ Currently lacks adequate program capability to implement the new or revised requirements.

{State Department/Agency} will be working with EPA to implement the Stage 2 DBPR within the scope of its current authority and capability, as outlined in the six areas identified in §142.12(b)(3)(i-vi):

i) Informing PWSs of the new EPA (and upcoming state) requirements and the fact that EPA will be overseeing implementation of the requirements until EPA approves the state revision.

State	EPA	
____	____	Provide copies of regulation and guidance to other state agencies, public water systems (PWSs), technical assistance providers, associations, or other interested parties.
____	____	Educate and coordinate with state staff, PWSs, the public, and other water associations about the requirements of this regulation.
____	____	Notify affected systems of their requirements under the Stage 2 DBPR.
____	____	Other:

ii) Collecting, storing, and managing laboratory results, public notices, and other compliance and operation data required by the EPA regulations.

State	EPA	
____	____	Devise a tracking system for PWS reporting pursuant to the Stage 2 DBPR.
____	____	Keep PWSs informed of reporting requirements during development and implementation.
____	____	Report Stage 2 DBPR violation and enforcement information to SDWIS as required.
____	____	Other:

iii) Assisting EPA in the development of the technical aspects of the enforcement actions and conducting informal follow-up and violations (telephones calls, letters, etc.).

State	EPA	
____	____	Issue notices of violation (NOVs) for treatment technique, MCL, and monitoring/ reporting violations of the Stage 2 DBPR.

____ ____ Provide immediate technical assistance to PWSs with treatment technique, MCL and/or monitoring/reporting violations to try to bring them into compliance.
____ ____ Refer all violations to EPA for enforcement if they have not been resolved within 60 days of the incident that triggered the violation. Provide information as requested to conduct and complete any enforcement action referred to EPA.
____ ____ Other:

iv) Providing technical assistance to PWSs.

State EPA
____ ____ Conduct training within the state for PWSs on Stage 2 DBPR rule requirements.
____ ____ Provide technical assistance through written and/or verbal correspondence with PWSs.
____ ____ Provide on-site technical assistance to PWSs as requested and needed to ensure compliance with this regulation.
____ ____ Coordinate with other technical assistance providers and organizations to provide accurate information and aid in a timely manner.
____ ____ Other:

v) Providing EPA with all information prescribed by the State Reporting Requirements in §142.15.

State EPA
____ ____ Report any violations incurred by PWSs for this regulation each quarter.
____ ____ Report any enforcement actions taken against PWSs for this regulation each quarter.
____ ____ Report any variances or exemptions granted for PWSs for this regulation each quarter.
____ ____ Other:

vi) For states whose request for an extension is based on a current lack of program capability to implement the new or revised requirements, taking the following steps to remedy the capability deficiency.

State EPA
____ ____ Acquire additional resources to implement these regulations (list of specific steps being taken attached as {**List A**}).
____ ____ Provide quarterly updates describing the status of acquiring additional resources.
____ ____ Other:

I affirm that the **{State Department/Agency}** will implement provisions of the Stage 2 DBPR as outlined above.

_____
{Agency Director or Secretary} Date

_____
{Name of State Agency}

I have consulted with my staff and approve your extension for the aforementioned regulation. I affirm that EPA Region **{Region}** will implement provisions of the Stage 2 DBPR as outlined above.

_____
Regional Administrator Date
EPA Region **{Region}**

This Extension Agreement will take effect upon the date of the last signature.

4.3 State Primacy Package

The Primacy Revision Application package should consist of the following sections:

- ☐ State Primacy Revision Checklist
- ☐ Text of the State's Regulation
- ☐ Primacy Revision Crosswalk
- ☐ State Reporting and Recordkeeping Checklist
- ☐ Special Primacy Requirements
- ☐ Attorney General's Statement of Enforceability

4.3.1 The State Primacy Revision Checklist

This section is a checklist of general primacy requirements, as shown in Table 4-2. In completing this checklist, the state must identify the program elements that it has revised in response to new federal requirements. **If an element has been revised, the state should indicate a "Yes" answer in the "Revision to State Program" column and should submit appropriate documentation**. For elements that did not require revision, the state need only list the citation and date of adoption in the "Revision to State Program" column. During the application review process, EPA will insert findings and comments in the final column.

The 1996 SDWA Amendments include new provisions for PWS definition and administrative penalty authority. States must adopt provisions at least as stringent as these new provisions, now codified at §142.2 and §142.10. Failure to revise these elements can affect primacy for the Stage 2 DBPR.

States may bundle the primacy revision packages for multiple rules. If states choose to bundle requirements, the Attorney General's Statement should reference all of the rules included.

4.3.2 Text of the State's Regulation

Each primacy application package should include the text of the state regulation.

4.3.3 Primacy Revision Crosswalk

The Primacy Revision Crosswalk, in Appendix A, should be completed by states in order to identify state statutory or regulatory provisions that correspond to each federal requirement. If the state's provisions differ from federal requirements, the state should explain how its requirements are no less stringent.

Table 4-2. State Primacy Revision Checklist

Required Program Elements		Revision to State Program	EPA Findings/Comments
§141.2	Definitions		
§142.10(b)(6)(iii)	Right of entry		
§142.10(b)(6)(iv)	Authority to require records		
§142.10(b)(6)(v)	Authority to require public notification		
§142.10(b)(6)(vi)	Authority to assess civil and criminal penalties		

Required Program Elements		Revision to State Program	EPA Findings/Comments
§142.10(b)(6)(vii)	Authority to require CCRs		
§142.10(c)	Maintenance of records		
§142.10(d)	Variance/exemption conditions (if applicable)*		
§142.10(e)	Emergency plans		
§142.10(f)	Administrative Penalty Authority**		

* Regulations published in the August 14, 1998 *Federal Register*.
** Requirement from the 1996 Amendments. Regulations published in the April 28, 1998 *Federal Register*.

4.3.4 State Recordkeeping and Reporting Checklist [40 CFR 142.14, 40 CFR 142.15]

The Stage 2 DBPR does not add any state reporting requirements, but does include state recordkeeping requirements.

The state should use the Primacy Revision Crosswalk in Appendix A to demonstrate that state recordkeeping requirements are consistent with federal requirements. If state requirements are not the same as federal requirements, the state must explain how its requirements are "no less stringent" as per 40 CFR §142.10. States may want to include in their State Primacy Revision Application how long the state will keep the records and in what format the data will be kept.

The Primacy Revision Crosswalk includes state recordkeeping requirements indicating that the state must:

- Keep records of the IDSE monitoring plans, plus any modifications made by the state. The state keeps these records until replaced or revised by approved IDSE Reports. [§142.14(a)(8)(i)]

- Keep records of system IDSE Reports and 40/30 Certifications, plus any modifications required by the state until reversed or revised in their entirety. [§142.14(a)(8)(ii)]

- Keep records of operational evaluations submitted by systems for 10 years following submission. [§142.14(a)(8)(iii)]

4.3.5 Special Primacy Requirements [40 CFR 142.16]

The Special Primacy Requirements section of the crosswalk is where the state has the opportunity to describe how it will satisfy these provisions. Special primacy conditions pertain to specific regulations where implementation of the rule involves activities beyond general primacy provisions. States must include these rule-distinct provisions in a application for approval or revision of their program. Section 4.4 provides guidance on how states may choose to meet the special primacy requirements of the Stage 2 DBPR.

4.3.6 Attorney General's Statement of Enforceability [40 CFR 142.12(c)(2)]

The complete and final primacy revision application must include an Attorney General's Statement certifying that the state regulations were duly adopted and are enforceable (unless EPA has waived this requirement by letter to the state). The Attorney General's Statement should also certify that the state does not have any audit privilege or immunity laws or, if it has such laws, that these laws do not prevent

the state from meeting the requirements of the SDWA. If a state has submitted this certification with a previous revision package, then the state should indicate the date of submittal and the Attorney General need only certify that the status of the audit laws has not changed since the prior submittal. An example of an Attorney General's Statement is presented in Example 4-2.

4.3.6.1 Guidance for States on Audit Privilege and/or Immunity Laws

In order for EPA to properly evaluate the state's request for approval, the State Attorney General or independent legal counsel should certify that the state's environmental audit immunity and/or privilege and immunity law does not affect its ability to meet enforcement and information gathering requirements under SDWA. This certification should be reasonably consistent with the wording of the state audit laws and should demonstrate how state program approval criteria are satisfied.

EPA will apply the criteria outlined in its "Statement of Principles" memo issued on February 14, 1997, (www.epa.gov/epaoswer/hazwaste/state/policy/policies.htm) to determine whether states with audit laws have retained adequate enforcement authority for any authorized federal programs. The principles articulated in the guidance are based on the requirements of federal law, specifically the enforcement and compliance and state program approval provisions of environmental statutes and their corresponding regulations. The Principles provide that if provisions of state law are ambiguous, it will be important to obtain opinions from the State Attorney General or independent legal counsel interpreting the law as meeting specific federal requirements. If the law cannot be so interpreted, changes to state laws may be necessary to obtain federal program approval. Before submitting a package for approval, states with audit privilege and/or immunity laws should initiate communications with appropriate EPA regional offices to identify and discuss the issues raised by the state's audit privilege and/or immunity law.

The guidance for states on Audit Law Privilege and/or Immunity Laws is currently under review. If amended, EPA will issue an addendum to this document with the revised guidance.

Example 4-2. Example of Attorney General's Statement

Model Language

I hereby certify, pursuant to my authority as (1) and in accordance with the Safe Drinking Water Act as amended, and (2), that in my opinion the laws of the [State/Commonwealth of (3)] [or tribal ordinances of (4)] to carry out the program set forth in the "Program Description" submitted by the (5) have been duly adopted and are enforceable. The specific authorities provided are contained in statutes or regulations that are lawfully adopted at the time this Statement is approved and signed and will be fully effective by the time the program is approved.

I. For States with No Audit Privilege and/or Immunity Laws

Furthermore, I certify that [State/Commonwealth of (3)] has not enacted any environmental audit privilege and/or immunity laws.

Model Language

II. For States with Audit Laws that do Not Apply to the State Agency Administering the Safe Drinking Water Act

Furthermore, I certify that the environmental [audit privilege and/or immunity law] of the [State/Commonwealth of (3)] does not affect the ability of (3) to meet enforcement and information gathering requirements under the Safe Drinking Water Act because the [audit privilege and/or immunity law] does not apply to the program set forth in the "Program Description." The Safe Drinking Water Act program set forth in the "Program Description" is administered by (5); the [audit privilege and/or immunity law] does not affect programs implemented by (5), thus the program set forth in the "Program Description" is unaffected by the provisions of [State/Commonwealth of (3)] [audit privilege and/or immunity law].

III. For States with Audit Privilege and/or Immunity Laws that Worked with EPA to Satisfy Requirements for Federally Authorized, Delegated, or Approved Environmental Programs

Furthermore, I certify that the environmental [audit privilege and/or immunity law] of the [State/Commonwealth of (3)] does not affect the ability of (3) to meet enforcement and information gathering requirements under the Safe Drinking Water Act because [State/Commonwealth of (3)] has enacted statutory revisions and/or issued a clarifying Attorney General's Statement to satisfy requirements for federally authorized, delegated, or approved environmental programs.

Seal of Office

_____
Signature

_____
Name and Title

_____
Date

(1) State Attorney General or attorney for the primacy agency if it has independent legal counsel.
(2) 40 CFR 142.11(a)(6)(i) for initial primacy applications or 40 CFR 142.12(c)(1)(iii) for primacy program revision applications.
(3) Name of state or commonwealth.
(4) Name of tribe.
(5) Name of primacy agency.

4.4 Guidance for the Special Primacy Requirements of the Stage 2 DBPR

In addition to adopting basic primacy requirements specified in 40 CFR 142, states are required to adopt primacy provisions pertaining to specific regulations where implementation of the rule involves activities beyond general primacy provisions. The purpose of these provisions is to allow state flexibility in implementing a regulation that (1) applies to specific system configurations within the particular state and (2) can be integrated with a state's existing PWSS Program. States must include these rule-distinct provisions in an application for approval or revision of their program. This section contains information and guidance that states can use when addressing the special primacy requirements of the Stage 2 DBPR. The guidance addresses special primacy conditions in the same order that they occur in the rule. In the state primacy revision application packages, the state must explain how they intend to accomplish the requirements from §142.16.

4.4.1 Special Primacy Requirements Regarding Consecutive System Monitoring

§142.16 Special primacy requirements. (m) Requirements for states to adopt §141, Subparts U and V. In addition to the general primacy requirements elsewhere in this part, including the requirements that state regulations be at least as stringent as federal requirements, an application for approval of a state program revision that adopts §141, Subparts U and V, must contain a description of how the state will implement a procedure for addressing modification of wholesale system and consecutive system monitoring on a case-by-case basis for part 141 Subpart V outside the provisions of §141.29 of this chapter, if the state elects to use such an authority. The procedure must ensure that all systems have at least one compliance monitoring location.

Guidance

§141.29 allows states to modify monitoring requirements of consecutive systems to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes.

The Stage 2 DBPR gives states the opportunity to specify alternative monitoring requirements for multiple consecutive systems in a combined distribution system. These modifications must not undermine public health protection and all systems, including consecutive systems, must comply with the TTHM and HAA5 MCLs based on the LRAA. However, such a program would allow the state to establish monitoring requirements that account for complicated distribution system relationships, such as where neighboring systems buy from and sell to each other regularly throughout the year, water passes through multiple consecutive systems before it reaches a user, or a large group of interconnected systems have a complicated combined distribution system.

If states choose to address this issue and develop procedures for addressing consecutive systems outside the provisions of the Stage 2 DBPR, they should consider the following:

- As a minimum, each consecutive system must collect at least one sample among the total number of samples required for the combined distribution system. Each consecutive system must base compliance on samples collected within its distribution system.

- The consecutive system is responsible for ensuring that required monitoring is completed and the system is in compliance.

- The consecutive system may conduct the monitoring itself or arrange for the monitoring to be done by the wholesale system or another outside party. Whatever approach it chooses, the consecutive system must document its monitoring strategy as part of its DBP monitoring plan.

States can satisfy the special primacy condition regarding consecutive system monitoring by including a copy of the procedure they will use for addressing consecutive systems outside the provisions of §141.29. Alternatively, states can simply attest that they will not use an authority to address consecutive system monitoring outside of §141.29.

References for more detailed guidance

1. USEPA. *Consecutive System Guidance Manual*. EPA XXX-X-XX-XXX. Unpublished, check the following Web site for availability: www.epa.gov/safewater/disinfection/stage2.

2. AWWARF. 2002. Guidance Manual for Monitoring Distribution System Water Quality. Denver, CO. 325 pp.

3. Routt, J.C., N.G. Pizzi. 2000. Kentucky-American Water's Cooperative, Step-wise Process of Assisting Two Small Contiguous Systems in Complying with Pending D/DBP Requirements. Proceedings AWWA WQTC, November 2000.

4. Taylor, J.S. et al. 2005. Effects of Blending on Distribution System Water Quality. AWWARF. Denver, CO.

5. AWWA. 2004. G200-04: Distribution System Operations and Management. Denver, CO.

6. AWWA. 2003. Principles and Practices of Water Supply Operations: Water Transmission and Distribution, Third Edition. Denver, CO. 553 pp.

7. Lauer, William C., ed. 2005. Water Quality in the Distribution System. AWWA. Denver, CO. 1,083 pp.

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Section 5

SDWIS Reporting and SNC Definitions

Note: This section is under development.

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Section 6

Public Notification and Consumer Confidence Report Examples

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This section provides examples of violations that systems may incur under the Stage 2 DBPR. These examples address the public notification and CCR requirements for systems that incur these kinds of violations. Public notification and notification in the CCR are required follow-up activities for violations of the National Primary Drinking Water Regulations. Also included in the examples are sample public notices and sample excerpts from CCR reports that would meet these public notification and CCR requirements. In the public notification samples, the language in italics is required in Appendix B to Subpart Q of 40 CFR 141.

EPA has developed CCRWriter and CCRiWriter to help CWSs quickly create their CCRs. The CCRWriter is a desktop application. A CD-ROM of the software can be ordered by contacting the Safe Drinking Water Hotline at 1-800-426-4791. The CCRiWriter is a web-based version of the CCRWriter and requires internet access to use. The CCRiWriter can be obtained from EPA's Web site at www.epa.gov/safewater/ccr/tools.html.

Issue 1: TTHM MCL Violation

System Description - System A

System A is a small Subpart H system that uses two large ground water wells determined to be under the direct influence of surface water. The system treats the water from each well by filtration through bag and cartridge filters and by disinfection with chlorine on a full-time basis. The system utilizes two filtration/disinfection treatment plants known as WTP 1 and WTP 2.

Population Served:	8,200
Source #1:	Well 1
Treatment:	Filtration, chlorine
Source #2:	Well 2
Treatment:	Filtration, chlorine

This system was required to comply with the TTHM and HAA5 RAA requirement under the Stage 1 DBPR but is now required to comply with the LRAA requirement on Schedule 4 under Stage 2 DBPR. System A conducted *E. coli* monitoring under the LT2ESWTR and was able to avoid *Cryptosporidium* monitoring, so it must begin complying with Stage 2 DBPR by October 1, 2013. Note that for compliance with Stage 2 DBPR, System A is required to collect two dual sample sets per quarter at representative high TTHM and HAA5 sites.

The operator takes the dual samples during times when the disinfection systems are operating under normal conditions and collects the samples at the locations and according to the schedule specified in the provisions of the system's Compliance Monitoring Plan.

Situation

Table 6-1 summarizes the Stage 2 DBPR TTHM monitoring results for four quarters at two sites beginning October 1, 2013. In July 2014, System A's operator collects the fourth scheduled set of two TTHM samples (at locations defined in the Compliance Monitoring Plan). The operator enters the values on the TTHM monitoring forms and calculates a quarterly arithmetic average concentration for each sampling location.

Table 6-1. System A 2014 TTHM Monitoring Results

Quarterly Sampling Dates		Distribution System Results (mg/L)	
		Location 1	**Location 2**
October 2013		0.030	0.020
January 2014		0.063	0.059
April 2014		0.200	0.072
July 2014		0.300	0.078
Compliance Calculation	Sum	0.593	0.229
	÷ 4	0.148	0.057
	4th Quarter LRAA	0.148 > 0.08	0.057 < 0.08

Public Notification and Consumer Confidence Report Requirements

System A has completed a full year of monitoring under Stage 2 DBPR and must use this data to compute LRAAs at each location. (After this time, the system will compute LRAAs each quarter.) The operator sums quarterly TTHM results and divides by 4 to determine LRAA compliance with the Stage 2 DBPR MCL of 0.08 mg/L. The TTHM result for location 1 is 0.148 mg/L; therefore, the operator must report an MCL violation. The LRAA for location 2 is below the MCL.

This is an MCL violation and requires Tier 2 public notification. The system must provide public notification as soon as practical but no later than 30 days after of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other method reasonably expected to reach affected individuals that would not have received the information by mail or the direct delivery method used. The system was aware of the violation on July 15, 2014.

An example of a public notice that fulfills the public notification requirements for these violations is shown in Example 6-1.

All MCL violations must also be included in the CCR. An explanation of how the system returned to compliance could also be included. An example of a report of these violations that could be used in the system's CCR is shown in Example 6-2.

Example 6-1. Example Tier 2 Public Notification for TTHM MCL Violation

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER
TTHM MCL Violation at System A

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

We routinely monitor for the presence of drinking water contaminants. Testing results from October 2013 to July 2014 show that our system exceeds the standard, or maximum contaminant level (MCL), for total trihalomethanes (TTHMs). We became aware of this situation on July 15, 2014. The standard for TTHMs is 0.080 mg/L averaged at each sampling location for a year. The level of TTHMs averaged at one location for a year was 0.148 mg/L.

What should I do?

There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers. If you have specific health concerns, consult your doctor.

You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

What does this mean?

This is not an emergency. If it had been, you would have been notified within 24 hours.

Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

What is being done?

TTHMs are four volatile organic chemicals which form when disinfectants react with natural organic matter in the water. We are working to minimize the formation of TTHMs while ensuring an adequate level of disinfection to protect customers from exposure to bacteria. We have since taken samples at this location and throughout the system and had them tested. They show that we now meet the standards.

For more information, please contact John Johnson, manager of System A, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by System A.

State Water System ID# SA1234582. Sent: July 20, 2014

Example 6-2. Example of a Notice in the CCR for TTHM MCL Violation

Water Quality Data

Contaminant	MCL	MCLG	Detected	Date	Violation	Source
TTHMs [Total trihalomethanes] (ppb) (LRAA)	120	0	Avg=148 Range: 30 - 300	July 2014	Yes*	By-product of drinking water chlorination

*System A exceeded the MCL for TTHMs at the end of July. The system's locational running annual average (LRAA) for location 1 was 148 ppb. More information about this violation is provided in the violation section.

Violation

- Testing results from October 2013 to July 2014 show that our system exceeds the standard, or maximum contaminant level (MCL), for total trihalomethanes (TTHMs). The standards for TTHMs are 0.080 mg/L averaged at any individual monitoring location averaged over the year. The level of TTHMs averaged over an individual monitoring location was 0.148 mg/L. TTHM are four volatile organic chemicals which form when disinfectants react with natural organic matter in the water. We are working to minimize the formation of TTHMs while ensuring an adequate level of disinfection to protect customers from exposure to bacteria.
- We have since taken samples at this location and throughout the system and had them tested. They show that we meet the standards.

Issue 2: LRAA and Compliance Calculations for TTHM and HAA5 M&R Violations

System Description - System B

System B is a small Subpart H system serving 8,900 people. They are on Schedule 4 and the requirements of Stage 2 DBPR are applicable on or before October 1, 2014 because System B is required to monitoring for *Cryptosporidium* under the LT2ESWTR.

The system uses surface water treated at a conventional filtration plant. The system uses chlorine as a chemical disinfectant applied at one location and must monitor TTHM and HAA5 according to the requirements of §141.621(a). Under the Stage 2 DBPR, samples must be taken in the distribution system at a frequency of two dual sample sets every 90 days. One quarterly set must be taken during the peak historical month for DBP concentrations. All monitoring must take place at the locations recommended to the primacy agency in the IDSE Report submitted under §141.600–605.

Population Served:	8,900
Source:	Surface water
Treatment:	Conventional filtration, chlorine

Situation

Table 6-2 presents a summary of System B's TTHM and HAA5 monitoring results.

Table 6-2. System B 2014 TTHM and HAA5 Monitoring Results (mg/L)

		2014						2015						
Parameter		JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
TTHM MCL = 0.080 mg/L	Site 1				0.068			0.070			0.070			
	Site 2				0.072			0.070			0.068			
HAA5 MCL = 0.060 mg/L	Site 1				0.042			0.055			0.038			
	Site 2				0.040			0.060			0.046			
		2016						2017						
Parameter		JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	LRAA
TTHM MCL = 0.080 mg/L	Site 1	NS												0.069
	Site 2	NS												0.070
HAA5 MCL = 0.060 mg/L	Site 1	NS												0.045
	Site 2	NS												0.049

NS=No sample taken
LRAA=Locational running annual average

In August 2015, System B reviews the data for the first year of compliance monitoring for the Stage 2 DBPR. However, System B did not complete the necessary monitoring of TTHM and HAA5 in the fourth quarter, July 2015.

Public Notification and Consumer Confidence Report Requirements

System B's sampling record shows a major monitoring and reporting (M&R) violation in 2015 resulting from a failure to take the required samples. In this case, when only two samples per quarter are required, the failure to sample for one quarter is a major M&R violation and must be reported to SDWIS for both TTHM and HAA5.

The system must provide Tier 3 public notice of the violation within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonably expected method to reach affected individuals that would not have received the information by mail or the direct delivery method used.

Since System B is a CWSs, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on August 15, 2015. The public could therefore be informed of the violation in the CCR produced for calendar year 2015 if the CCR is released prior to July 1, 2016 (the CCR for calendar year 2015 is required to be released by July 1, 2016, for compliance with the CCR Rule). In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 2015 or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 2015, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-3. An example of a report of this violation in the CCR is shown in Example 6-4.

Example 6-3. Example Tier 3 Public Notification for LRAA and Compliance Calculations for TTHM and HAA5 M&R Violations

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER
Monitoring and Reporting Requirements Not Met for System B

Our water system recently failed to collect the correct number of drinking water samples. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

We routinely monitor for the presence of drinking water contaminants. In July 2015 our system failed to collect the required number of samples to test for total trihalomethanes (TTHMs) and haloacetic acids (HAA5s) in our drinking water. We became aware of this situation on August 15, 2015. Based on the data we collected over the past year, we are not in violation of the standards for either TTHM or HAA5s. The standard for TTHMs is 0.080 mg/L at any individual monitoring location averaged over the year and for HAA5 is 0.060 mg/L at any individual monitoring location averaged over the year.

What should I do?

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

What was done?

TTHMs and HAA5s are a group of chemicals that are formed when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water. We are working to minimize the formation of TTHMs and HAA5s while ensuring an adequate level of disinfection to protect customers from exposure to bacteria.

We have set-up new procedures at the systems to ensure all samples are collected and analyzed according to our monitoring plan.

For more information, please contact John Johnson, manager of System B, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by System B.

State Water System ID# SA1234589. Sent: August 22, 2015

Example 6-4. Example of a Notice in the CCR for LRAA and Compliance Calculations for TTHM and HAA5 M&R Violations

Violation

- Our water system recently failed to collect the correct number of drinking water samples. We routinely monitor for the presence of drinking water contaminants. In July 2015, our system failed to collect the required number of samples to test for total trihalomethanes (TTHMs) and haloacetic acids (HAA5s) in our drinking water. Using the data we have collected over the past year, we are not in violation of the standards for either TTHM or HAA5s. The standards for TTHMs are 0.080 mg/L at any individual monitoring location averaged over the year and for HAA5s are 0.060 mg/L at any individual monitoring location averaged over the year.
- *TTHMs and HAA5s are a group of chemicals that are formed when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water.* We are working to minimize the formation of TTHMs and HAA5s while ensuring an adequate level of disinfection to protect customers from exposure to bacteria. Since we failed to collect the correct number of samples in July 2015, any potential health effects related to the use of that water are unknown.
- We have set-up new procedures at the systems to ensure all samples are collected and analyzed according to our monitoring plan.

Issue 3: Bromate M&R Violation

System Description - System D

System D is a small Subpart H CWS that serves 4,700 people. They have one surface water source, and treat with a direct filtration plant that uses both ozone and chlorine as disinfectants. Because they use ozone, under the Stage 1 DBPR, System D was required to monitor for bromate at the entrance to the distribution system from their plant. The routine monitoring frequency was monthly, but the system was able to qualify for reduced monitoring of quarterly sampling because their monthly source water bromide RAA levels were less than 0.05 mg/l.

Population Served:	4,700
Source:	Surface water
Treatment:	Softening plant, ozone, chlorine

After March 31, 2009, if System D wants to continue reduced monitoring for bromate, they will need qualify using the new criteria under the Stage 2 DBPR. To meet the new criteria for reduced monitoring, System D needs to conduct monthly monitor for bromate for 1 year using Method 317.0 Revision 2.0, 326.0, or 321.8. Note that systems cannot use Method 300.1 to qualify for reduced monitoring.

Situation

In April 2009, System D discontinues its bromide sampling and begins sampling monthly for bromate using one of the new sampling methods. By March 2010, System D has a full year of monthly samples, and their RAA is 0.0015. This is below 0.0025 mg/L so the system now qualifies for reduced bromate sampling. In the second quarter of 2010, the system begins quarterly monitoring. However, in December 2010, their Bromate RAA is 0.0060 mg/L which exceeds 0.0025 mg/l. The system should have resumed monthly monitoring at that point.

On April 12, 2011, the state sent System D a letter indicating that their records showed that the system had failed to resume routine monitoring. System D began routine monitoring that month.

Table 6-3 summarizes System D's bromate monitoring results.

Table 6-3. System C Bromate and Bromide Monitoring Results (mg/L)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
2008	Bromide			0.004			0.003			0.002			0.002
	Bromate												
2009	Bromide			0.01									
	Bromate			0.0010	0.0020	0.0015	0.0016	0.0010	0.0020	0.0010	0.0005	0.0010	0.0025
2010	Bromide												
	Bromate	0.0020	0.0020	0.0010			0.0020			0.0025			0.0060

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
2011	Bromate	NS	NS	0.0010	0.0020	0.0025	0.0018	0.0010	0.0023	0.0026	0.0024	0.0020	
2012	Bromate	0.0010	0.0010	0.0020	0.0022			0.0010			0.0020		
Note: RAAs are calculated on a quarterly basis for Bromide and Monthly for Bromate. RAA = Running Annual Arithmetic Average NS = No samples taken													

Public Notification and Consumer Confidence Report Requirements

System D is not eligible for a reduction in monitoring frequency after the month of December 2010 because the bromate RAA (0.0030 mg/L) is greater than 0.0025 mg/L for the four most recent quarters. Beginning in January 2011, System D is required to begin monitoring monthly for bromate. Since System D did not collect another bromate sample until March 2011, System D is in violation of the monitoring and reporting requirement.

The system must provide Tier 3 public notice of the violation within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other method reasonably expected to reach affected individuals that would not have received the information by mail or the direct delivery method used.

Since System D is a CWS, it could use the CCR to inform the public of the Tier 3 violations provided that the CCR is released within 1 year of the system's learning of the violation. This system was alerted to the violation on April 12, 2011, therefore the system would need to use the CCR produced for calendar year 2011to inform the public of the violation. The system could use this CCR if the CCR is released prior to April 12, 2012 (the CCR for calendar year 2011 is required to be released by July 1, 2012, for compliance with the CCR Rule). In this situation, additional public notification would not be required.

However, whether public notification is provided by the CCR for calendar year 2011 or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 2011. All violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-5. An example of a report of this violation in the CCR is shown in Example 6-6.

Example 6-5. Example Tier 3 Public Notification for Bromate M&R Violation

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER
Monitoring and Reporting Requirements Not Met for System D

On April 12, 2011 we became aware that our system recently failed to collect the correct number of drinking water samples. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

Our system qualified to reduce the number of samples we are required to analyze for bromate in March 2010. Bromate is a chemical that is formed when a system uses ozone to disinfect drinking water and it reacts with naturally occurring bromide in source water. We were allowed to take 1 sample per quarter rather than 1 sample per month. In December 2010, the running annual average exceeded 0.0025 mg/L and we no longer qualify for reduced quarterly bromate monitoring. Beginning in January 2011, we failed to begin monitoring monthly for bromate.

What should I do?

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

What was done?

We began monitoring monthly for bromate in April 2011 and will continue to monitoring on this schedule until or unless we qualify for reduced monitoring.

For more information, please contact John Johnson, manager of System D, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by System D.

State Water System ID# SA1234589. Sent: May 15, 2011

Example 6-6. Example of a Notice in the CCR for Bromate M&R Violation

Violation

- Our system failed to collect the correct number of drinking water samples. Our system qualified to reduce the number of samples required to monitor for bromate in March 2010. Bromate is a chemical that is formed when a system uses ozone to disinfect drinking water and it reacts with naturally occurring bromide in source water. We were allowed to take 1 sample per quarter rather than 1 sample per month. In December 2010, the running annual average exceeded 0.0025 mg/L and we no longer qualify for reduced quarterly bromate monitoring. Beginning in January 2011, we failed to begin monitoring monthly for bromate. Since we failed to collect the correct number of samples in 2011, any potential health effects related to the use of that water are unknown.
- We began monitoring monthly for bromate in April 2011 and will continue to monitoring on this schedule until reduced monitoring is again appropriate.

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