



Implementation Guidance for the Stage 1 Disinfectants/ Disinfection Byproducts Rule

This document does not substitute for EPA regulation nor is this document regulation itself. Thus, it cannot impose legally-binding requirements on EPA, states, or the regulated community, and may not apply to a particular situation based upon the circumstances.

Contents

Introduction	ix
Section I. Rule Requirements	1
A. Stage 1 DBPR Executive Summary	3
B. Key Dates for the Stage 1 DBPR	11
Section II. SDWIS Reporting and SNC Definitions	1
A. Safe Drinking Water Information System (SDWIS) Reporting Under the Stage 1 DBPR ..	3
A.1 Federally Reported Violations	3
B. SNC Definitions for the Stage 1 DBPR	14
Section III. State Primacy Revision Applications	1
A. State Primacy Program Revision	3
A.1 The Revision Process	5
A.2 The Final Review Process	7
B. State Primacy Program Revision Extensions	7
B.1 The Extension Process	7
B.2 Criteria that an Extension Request Must Meet	7
B.3 Conditions of the Extension	8
C. State Primacy Package	10
C.1 Section I—The State Primacy Revision Checklist (40 CFR 142.10)	10
C.2 Section II—Text of the State’s Regulation	11
C.3 Section III—Primacy Revision Crosswalk	11
C.4 Section IV—State Reporting and Recordkeeping Checklists	11
C.5 Section V—Special Primacy Requirements (40 CFR 142.16)	12
C.6 Section VI—Attorney General’s Statement of Enforceability	12
D. Guidance for Special Primacy Requirements	15
D.1 Special Primacy Requirements—Stage 1 DBPR	15
D.2 Other Requirements in the Stage 1 DBPR	26
Section IV. Other Resources and Guidance	1
A. Technical Information Available on the Stage 1 DBPR	3
B. Rule Presentation	4
C. Fact Sheets	4
D. Frequently Asked Questions	17
E. Determining Monitoring Frequency for TTHM and HAA5 Sampling	39
Appendices	
Appendix A Primacy Revision Crosswalk	A-1
Appendix B Sample Extension Agreement	B-1
Appendix C Statement of Principles—Guidance on Audit Law Issues	C-1
Appendix D Stage 1 Plain English Summary	D-1
Appendix E Stage 1 DBPR Rule Language	E-1
Appendix F Examples of Stage 1 DPBR Monitoring Forms for States	F-1

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Abbreviations Used in This Document

ASTM: American Society for Testing and Materials
AWWA: American Water Works Association
BAC: Biologically Activated Carbon
BAT: Best Available Technology
CCR: Consumer Confidence Report
CDC: Centers for Disease Control and Prevention
CFE: Combined Filter Effluent
CFR: Code of Federal Regulations
CWS: Community Water System
D/DBP: Disinfectants and Disinfection Byproducts
DBP: Disinfection Byproducts
DBPP: Disinfection Byproducts Precursors
DBPR: Disinfection Byproducts Rule
DOC: Dissolved Organic Carbon
DTF: Data Transfer Format
DWPD: Drinking Water Protection Division
EC: Enhanced Coagulation
EPA: United States Environmental Protection Agency
ES: Enhanced Softening
ESWTR: Enhanced Surface Water Treatment Rule
FACA: Federal Advisory Committee Act
FR: Federal Register
FRDS: Federal Reporting Data System
GAC10: Granular Activated Carbon with ten minute empty bed contact time and 180 day reactivation frequency
GWR: Ground Water Rule
GWUDI: Ground Water Under the Direct Influence of Surface Water
HAA5: Haloacetic Acids (five)(chloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid and dibromoacetic acid)
HPC: Heterotrophic Plate Count
ICR: Information Collection Rule (issued under section 1412(b) of the SDWA)
IESWTR: Interim Enhanced Surface Water Treatment Rule
Log Inactivation: Logarithm of (N_0/N_T)
Log: Logarithm (common, base 10)
LRAA: Locational Running Annual Average
LT1ESWTR: Long-Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR: Long-Term 2 Enhanced Surface Water Treatment Rule
MCL: Maximum Contaminant Level
MCLG: Maximum Contaminant Level Goal
M-DBP: Microbial and Disinfectants/Disinfection Byproducts
mg/L: Milligrams per Liter
M/R: Monitoring/Reporting
MRDL: Maximum Residual Disinfectant Level

MRDLG: Maximum Residual Disinfectant Level Goal
NIPDWR: National Interim Primary Drinking Water Regulation
nm: nanometers
NPDES: National Pollutant Discharge Elimination System
NPDWR: National Primary Drinking Water Regulation
NSCEP: National Service for Environmental Publications
NTIS: National Technical Information Service
NTNCWS: Non-Transient Non-Community Water System
OAR: Office of Air and Radiation
OECA: Office of Enforcement and Compliance Assurance
OGC: Office of General Counsel
OGWDW: Office of Ground Water and Drinking Water
OMB: Office of Management and Budget
ORC: Office of Regional Counsel
OSWER: Office of Solid Waste and Emergency Response
OW: Office of Water
PWS: Public Water System
PWSS: Public Water Supply Supervision Program
Reg. Neg.: Regulatory Negotiation
SDWA: Safe Drinking Water Act, or the “Act,” as amended 1996
SDWIS: Safe Drinking Water Information System
SNC: Significant Non-Compliance
Subpart H: PWS using surface water or ground water under the direct influence of surface water
SUVA: Specific Ultraviolet Absorbance
SW: Surface Water
SWTR: Surface Water Treatment Rule
TCR: Total Coliform Rule
TNCWS: Transient Non-Community Water Systems
TOC: Total Organic Carbon
TT: Treatment Technique
TTHM: Total Trihalomethanes (chloroform, bromdichloromethane, dibromochloromethane, and bromoform)
USGS: United States Geological Survey
UV: Ultraviolet
WTP: Water Treatment Plant
x log removal: Reduction to $1/10^x$ of original concentration

Introduction

This document provides guidance to EPA Regions and states exercising primary enforcement responsibility under the Safe Drinking Water Act (SDWA) concerning how EPA interprets the Stage 1 Disinfection Disinfectants Byproduct Rule (Stage 1 DPBR) under 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 provisions and EPA regulations described in this document contain legally binding requirements. This document does not substitute for those provisions 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 decisionmakers 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 was developed through a workgroup process involving Regions, states, and stakeholders, and contains the following sections:

Section I summarizes the Stage 1 DBPR and presents a timetable of important dates for this rule. Section II addresses violation determination and associated reporting requirements to assist states in their compliance activities. Section III 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 IV contains a series of “stand-alone” guidance materials that will help states and public water systems comply with the new requirements.

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 a sample extension agreement between EPA and a state which will allow the state and EPA to document how they will share rule implementation responsibilities if the state does not submit a primacy application by the deadline. Appendix C contains a “Statement of Principles” which outlines the criteria EPA will use to determine whether states with audit laws have retained adequate enforcement and information gathering authority to meet the requirements of the Safe Drinking Water Act (SDWA). Appendix D contains a Plain English summary of the rule. Appendix E contains the rule language of Stage 1 DBPR incorporating the technical amendments. Appendix F contains sample monitoring forms that can be used as template by states developing their own forms.

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. EPA may change this guidance in the future.

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Section I.

Rule Requirements

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I-A. The Stage 1 DBPR Executive Summary

Purpose

The purpose of this summary is to acquaint state decision-makers and public health officials with the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). The Stage 1 DBPR, published in the *Federal Register* on December 16, 1998 (63 FR 69390; www.epa.gov/OGWDW/mbdp/dbpfr.html; 66 FR 3770; www.epa.gov/safewater/mbdp/iesfr.html; Appendix E—rule language only), is the first part of a series of rules, the “Microbial-Disinfectants/Disinfection Byproducts Cluster” (M-DBP Cluster), to be published over the next several years that are intended to control microbial pathogens while minimizing the public health risks of disinfectants and disinfection byproducts (DBPs). The Stage 1 DBPR specifically addresses risks associated with disinfectants and DBPs. This rule was published concurrently with the Interim Enhanced Surface Water Treatment Rule (IESWTR), which addresses control of microbial pathogens.

Background

The 1974 Safe Drinking Water Act (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 (TTHMs), a group of four volatile organic chemicals which form when disinfectants react with natural organic matter in the water.

Although SDWA was amended slightly in 1977, 1979, and 1980, the most significant changes to the 1974 law occurred when SDWA was reauthorized in 1986. Disease-causing microbial contamination had not been sufficiently controlled under the original Act. To safeguard public health, the 1986 Amendments required EPA to set health goals, or maximum contaminant level goals (MCLGs) and maximum contaminant levels (MCLs) for 83 named contaminants. EPA was also required to establish regulations within certain time frames, require disinfection of all public 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 (NPDWR): The Total Coliform Rule (TCR) (40 CFR 141.21) and the Surface Water Treatment Rule (SWTR) (40 CFR 141 Subpart H). The TCR and SWTR 40 CFR 141 Subpart H provide the foundation for the M-DBP Cluster and are summarized below.

The TCR covers all public water systems. Since coliforms are easily detected in water, they are used to indicate a water system’s vulnerability to pathogens in the water. In the TCR, EPA set a MCLG of zero for total coliforms. EPA also set a MCL for total coliforms. 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. In addition, sanitary surveys are required every five or ten years (depending on the quality of the source water) for every system that collects fewer than five samples per month (typically systems that serve less than 4,100 people).

EPA issued the SWTR in response to Congress’ mandate requiring disinfection, and where necessary, filtration of systems that draw their water from surface sources before distribution. The SWTR applies to all systems that use surface water or ground water under the direct influence of surface water (GWUDI). The rule sets MCLGs for *Legionella*, *Giardia lamblia*, and viruses at zero since any exposure to these contaminants presents some level of health risk.

Specifically, the rule requires that a surface water system have sufficient treatment to reduce the source water concentration of *Giardia lamblia* and viruses by at least 99.9 percent (3 log) and 99.99 percent (4 log), respectively. A detectable disinfection residual must be maintained throughout the entire distribution system. For systems that filter, the adequacy of the filtration process is determined by measuring the turbidity of the treated water since high levels of turbidity often indicate that the filtration process is not working properly. The goal of the SWTR is to reduce risk to less than one infection per year per 10,000 people. However, the SWTR does not account for systems with high pathogen concentrations that, when treated at the levels required under the rule, still may not meet this health goal, and the rule does not specifically control for the protozoan *Cryptosporidium*.

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 (*i.e.*, 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 1994, 379 waterborne disease outbreaks were reported, with over 500,000 cases of disease. During this period, a number of agents were implicated as the cause, including protozoa, viruses, bacteria, and several chemicals. Most of the cases (but not the outbreaks) were associated with surface water, including a single outbreak of cryptosporidiosis in Milwaukee (over 400,000 cases).

In response to these findings, 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 public water systems, and the estimated reduction in health risks that would result from further regulation. The Act also increased scientific research requirements and emphasized cost-benefit analyses in the regulatory decision process.

Based on prevailing scientific data, the M-DBP Cluster is intended to control microbial pathogens while minimizing the public health risk from disinfectants and DBPs. Since multiple threats require multiple barriers, the IESWTR and Stage 1 DBPR expand on the foundation of the TCR, SWTR, and TTHM standards to target health risk outliers unaddressed by prior regulations.

The TTHM NPDWR of 1979 set a standard for TTHMs only for public water systems (PWSs) serving 10,000 or more people. The Stage 1 DBPR builds on the TTHM Rule by lowering the MCL and widening the range of affected systems to include all PWSs that add a disinfectant. Therefore, EPA believes that the promulgation of the Stage 1 DBPR will significantly decrease the risks posed by DBPs and disinfectants by covering many PWSs not currently regulated for TTHM or other DBPs.

Many water systems treat their water with a chemical disinfectant in order 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 in controlling many harmful microorganisms, they react with organic and inorganic matter (disinfection byproduct precursors—DBPPs) in the water and form DBPs, some of which pose health risks at 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 at high doses, the weight-of-evidence indicates that DBPs present a potential public health problem that must be addressed. One of the most complex questions facing water supply professionals is how to reduce risks from disinfectants and DBPs while providing increased protection against microbial contaminants. Much of the population is exposed to these risks; therefore, a substantial concern exists.

To address this concern, the Stage 1 DBP Rule updates and supersedes the 1979 TTHM standard by lowering the MCL for TTHMs and establishing maximum residual disinfection level (MRDL) limits for chlorine, chloramines, and chlorine dioxide and new MCLs for chlorite, bromate, and haloacetic acids (HAA5) for all community water systems and nontransient noncommunity water systems that add a chemical disinfectant for either primary or residual treatment. In addition, the Stage 1 DBP Rule requires conventional filtration systems to remove specified percentages of organic materials measured as total organic carbon (TOC) that may react with disinfectants to form DBPs.

By building on the foundation set forth by the original SDWA, the quality of drinking water has improved and public health protection has increased. The IESWTR and Stage 1 DBP Rules are part of a series of rules designed to expand on the foundation of prior rulemaking efforts. By encompassing previously unaddressed health risks from microbials and disinfection byproducts, the M-DBP Cluster continues to maximize drinking water quality and public health protection.

Development of the Stage 1 DBPR

The new rules are a product of 6 years of collaboration among the water supply industry, environmental and public health groups, and local, state, and federal governments. EPA first launched a rule-making process in 1992 and convened a Regulatory Negotiation (RegNeg) Advisory Committee under the Federal Advisory Committee Act (FACA), representing a range of stakeholders affected by possible regulation. The 1996 SDWA Amendments required EPA to develop rules to balance the risks between microbial pathogens and disinfection byproducts.

In 1997, a similar FACA process was implemented with the Microbial-Disinfectants/Disinfection Byproducts (M-DBP) Advisory Committee. The M-DBP Committee convened to collect, share, and analyze new information available since 1994, review previous assumptions made during the RegNeg process, as well as build consensus on the regulatory implications of this new information. Negotiations resulted in the following three proposals:

- C A staged approach to regulation of DBPs (referred to as the Stage 1 and Stage 2 DBPRs) incorporating Maximum Contaminant Levels (MCLs), Maximum Residual Disinfectant Levels (MRDLs), and treatment technique requirements;
- C A companion Interim Enhanced Surface Water Treatment Rule (IESWTR) designed to improve control of microbial pathogens and prevent inadvertent reductions in microbial safety as a result of DBP control efforts; and,
- C An Information Collection Rule (ICR) to collect information necessary to reduce many key uncertainties prior to subsequent negotiations for the Stage 2 DBPR.

Benefits of the Stage 1 DBPR

The Stage 1 DBPR is expected to reduce the risks associated with exposure to disinfectants and DBPs. The MCLs will reduce exposure to specific DBPs from the use of ozone (byproduct: bromate), chlorine dioxide (byproduct: chlorite), and chlorine (byproducts: TTHM and five Haloacetic Acids—(HAA5)). In addition, the implementation of a treatment technique (enhanced coagulation/ enhanced softening) will reduce overall exposure to the broad range of non-specified DBPs. In the Regulatory Impact Analysis for the Stage 1 DBPR, EPA estimated that the rule will result in a national annual average reduction in TTHM levels of 24 percent. As many as 140 million people will have increased protection from DBPs and their potential health risks, including bladder cancer and adverse developmental and reproductive health effects.

Applicability and Compliance Dates

The existing TTHM requirements apply only to systems serving 10,000 or more people. The Stage 1 DBPR covers a larger number of PWSs, applying to community water systems (CWSs) and nontransient noncommunity water systems (NTNCWSs) which add a chemical disinfectant to the water in any part of the drinking water treatment process. In addition, certain requirements apply to transient noncommunity water systems (TNCWSs) that use chlorine dioxide.

Subpart H systems (PWSs that use surface water or ground water under the direct influence of surface water—GWUDI—as a source) serving 10,000 or more people must comply with the requirements of the Stage 1 DBPR beginning January 1, 2002. States can grant up to 24 additional months for capital improvements for Subpart H systems serving 10,000 or more people. This extension extends the compliance date for meeting the MCL, but the system must monitor as required by the rule and report the results of any detected Stage 1 DBPR contaminants in their CCR. Since the system would not be in violation of the MCL, public notification would not be required. Subpart H systems that serve fewer than 10,000 people, and all affected ground water systems, must comply with the requirements beginning January 1, 2004.

Requirements of the Rule: Public Water Systems

MCLGs and MCLs for disinfection byproducts

The Stage 1 DBPR sets maximum contaminant level goals (MCLGs) for some of the regulated DBPs, sets a more stringent maximum contaminant level (MCL) for TTHM, and sets new MCLs for HAA5, bromate, and chlorite. MCLGs are non-enforceable public health goals set at concentrations to which no known or anticipated adverse health effects are expected to occur with an adequate margin of safety. MCLs are enforceable contaminant standards that are feasible to achieve.

Disinfection Byproduct	MCLG (mg/L)	MCL (mg/L)
Total Trihalomethanes (TTHM)		0.080
Chloroform		
Bromodichloromethane	zero	
Bromoform	zero	
Dibromochloromethane	0.06	
Five Haloacetic Acids (HAA5)		0.060
Monochloroacetic Acid		
Dichloroacetic Acid	zero	
Trichloroacetic Acid	0.3	
Monobromoacetic Acid		
Dibromoacetic Acid		
Chlorite	0.8	1.0
Bromate	zero	0.010

Compliance for TTHM and HAA5 MCLs is based on a running annual arithmetic average, computed quarterly, of quarterly averages of all samples. Compliance for the chlorite MCL is based on an arithmetic average of each three sample set taken in the distribution system. Compliance for the bromate MCL is based on a running annual arithmetic average, computed quarterly, of monthly samples.

MRDLGs and MRDLs for disinfectant residuals

To protect against potential health risks caused by high levels of residual disinfectants, the Stage 1 DBPR sets the following maximum residual disinfectant level goals (MRDLGs) and maximum residual disinfectant levels (MRDLs). Like MCLGs and MCLs, respectively, MRDLGs are non-enforceable, while MRDLs are enforceable.

Disinfectant	MRDLG (mg/L)	MRDL (mg/L)
Chlorine	4 (as Cl ₂)	4.0 (as Cl ₂)
Chloramines	4 (as Cl ₂)	4.0 (as Cl ₂)
Chlorine Dioxide	0.8 (as ClO ₂)	0.8 (as ClO ₂)

Systems using chlorine or chloramines may temporarily increase residual disinfectant levels to an appropriate level protect to public health in order to address specific microbiological contamination problems. These problems may be caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events. This option is NOT available for the use of chlorine dioxide.

Compliance for chlorine and chloramine MRDLs is based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples. Compliance for the chlorine dioxide MRDL is based on consecutive daily samples.

Treatment technique for disinfection byproduct precursors

The rule includes a treatment technique that applies to Subpart H systems using conventional filtration technology. The treatment technique was established because disinfectants can react with disinfection byproduct precursors (DBPPs) to form both regulated and non-regulated DBPs. The treatment technique requirements in the rule are designed to provide public health protection by minimizing the production of all DBPs. Compliance with the rule's treatment technique requirement can be achieved by removing specified percentages of Total Organic Carbon (TOC) using enhanced coagulation or enhanced softening. Alternatively, systems are compliant by showing they meet alternative performance criteria.

Best available technology (BAT)

EPA has specified the Best Available Technology (BAT) for each MCL and MRDL established in the rule. These technologies and methods are believed to be effective in controlling chemicals in drinking water while remaining economically feasible for PWSs to employ. PWSs must use the specified BAT if they wish to qualify for variances.

Chemical		Best Available Technology
DBPs	TTHM and HAA5	Enhanced coagulation or granular activated carbon (GAC 10), with chlorine as the primary and residual disinfectant
	Chlorite	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels
	Bromate	Control of ozone treatment process to reduce production of bromate
Disinfectants	Chlorine, chloramine, and chlorine dioxide	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels

Public water system recordkeeping and reporting requirements

For each disinfectant, contaminant, contaminant group, and treatment technique, EPA has developed routine compliance monitoring schemes to be protective of acute and chronic health concerns. The compliance monitoring requirements vary by the size and type of system, the treatment employed, and the disinfectant used. In many cases, systems may reduce monitoring frequencies after establishing a baseline that shows violations are unlikely.

Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which the samples were collected. Those required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. Systems that are required to conduct additional monitoring because of the disinfectant used (e.g., chlorine dioxide) are subject to additional reporting requirements if certain chemical levels are measured.

Laboratory methods and certification

The rule specifies analytical methods for measuring each relevant water quality parameter, disinfectant, contaminant, and DBPP. Consistent with current regulations, only certified laboratories can analyze samples for compliance with the MCLs with the exception of the daily measurement of chlorite at the entrance to the distribution system. For the daily measurement of chlorite, disinfectants and other specified parameters that EPA believes can be adequately measured by other than certified laboratories, and for which there is good reason to allow on-site analysis (e.g., for samples that may deteriorate before reaching a certified laboratory), EPA is requiring that analyses be conducted by a party approved by the state.

Requirements of the Rule: States or Other Primacy Agents

State primacy, recordkeeping, and reporting requirements

The Stage 1 DBPR requires states to adopt several new regulatory requirements including public notification requirements, MCLs for DBPs, MRDLs for disinfectants, and the requirements of Subpart L. In addition, states are required to adopt special primacy requirements and keep records of their activities, records of decisions, and PWS monitoring results. State reporting to EPA is covered under existing regulation.

More information can be obtained from:

- └ The Stage 1 Disinfectants/Disinfection Byproducts Rule
63 FR 69390 (December 16, 1998)
www.epa.gov/OGWDW/mdbp/dbpfr.html
- └ The Stage 1 Disinfectants/Disinfection Byproducts Rule:
Technical Corrections
66 FR 3770 (January 16, 2001)
www.epa.gov/safewater/mdbp/iesfr.html
- └ The EPA Safe Drinking Water Hotline, Telephone:
1.800.426.4791

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I-B. Key Dates for the Stage 1 DBPR

The compliance dates for the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR) are January 1, 2002 and January 1, 2004. Surface water systems and systems using ground water under the direct influence (GWUDI) of surface water that serve 10,000 or more people (large subpart H systems) will have to comply with the provisions of the rule beginning January 1, 2002. Surface water and GWUDI systems that serve fewer than 10,000 people (small subpart H systems) and all ground water systems will have to comply with the provisions of the rule beginning January 1, 2004. The timetable for the Stage 1 DBPR is presented in Table I-1.

Table I-1: Timetable for the Stage 1 DBPR Requirements

Date	DBPR Requirement
December 16, 1998	Rule is published in <i>Federal Register</i> [63 FR 1 69390].
February 16, 1999	60-day legal challenge period ends.
February 16, 1999	Methods specified in §141.131 for analyzing disinfection byproducts, disinfection residuals, and DBP precursors are approved for use [40 CFR 141.131(a)].
December 16, 2000	Final primacy applications must be submitted to EPA unless granted an extension [40 CFR 142.12(b)(1)]
January 1, 2001	Large Subpart H systems should begin monitoring to determine Step 1 TOC removal before the compliance date.
January 1, 2002	Large Subpart H CWSs and NTNCWSs must comply with the MCLs for TTHM, HAA5, bromate, and chlorite [40 CFR 141.64(b)(1)].
January 1, 2002	Large Subpart H CWSs and NTNCWSs must comply with the MRDLs for chlorine, chloramines, and chlorine dioxide [40 CFR 141.65(b)(1)].
January 1, 2002	Large Subpart H TNCWSs that use chlorine dioxide must comply with the MRDL for chlorine dioxide [40 CFR 141.65(b)(2)].
January 1, 2002	Requirements of Subpart L generally apply to large Subpart H CWSs and NTNCWs [40 CFR 141.130(b)(1)]. <ul style="list-style-type: none"> • Monitoring requirements. • Reporting and recordkeeping requirements. • Compliance. • Treatment technique for control of DBP precursors.
December 16, 2002	Final primacy revisions applications with approved extensions must be submitted to EPA [40 CFR 142.12(b)(2)].
January 1, 2003	Small Subpart H systems should begin monitoring to determine Step 1 TOC removal before the compliance date.
December 31, 2003	Systems which received an extension from the state to install GAC or membranes must comply with the Stage 1 DBPR [40 CFR 141.64(b)(2)].
January 1, 2004	Small Subpart H and all ground water CWSs and NTNCWSs must comply with the MCLs for TTHM, HAA5, bromate, and chlorite [40 CFR 141.64(b)(1)].

Date	DBPR Requirement
January 1, 2004	Small Subpart H and all ground water CWSs and NTNCWSs must comply with the MRDLs for chlorine, chloramines, and chlorine dioxide [40 CFR 141.65(b)(1)].
January 1, 2004	Small Subpart H and all ground water TNCWSs that use chlorine dioxide must comply with the MRDL for chlorine dioxide [40 CFR 141.65 (b)(2)].
January 1, 2004	<p>Requirements of Subpart L generally apply to small Subpart H and all ground water CWSs and NTNCWs [40 CFR 141.130(b)(1)].</p> <ul style="list-style-type: none"> • Monitoring requirements. • Reporting and recordkeeping requirements. • Compliance. • Treatment technique for control of DBP precursors.
June 30, 2005	Systems that made a clear and irrevocable financial commitment before the applicable compliance date to install technologies that limit TTHM and HAA5 to 0.040 mg/L and 0.030 mg/L, respectively, must have these technologies installed and operating. [40 CFR 141.135(a)(2)(iii)].

Section II.

SDWIS Reporting and SNC Definitions

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II-A. Safe Drinking Water Information System (SDWIS) Reporting Under the Stage 1 DBPR

SDWIS/FED (Safe Drinking Water Information System/Federal version) is an EPA national database storing routine information about the nation's drinking water. Designed to replace the system known as FRDS (Federal Reporting Data System), SDWIS/FED stores the information EPA needs to monitor approximately 175,000 public water systems.

States supervise the drinking water systems within their jurisdictions to ensure that each public water system meets state and EPA standards for safe drinking water. The Safe Drinking Water Act (SDWA) requires states to report drinking water information periodically to EPA; this information is maintained in SDWIS/FED.

States report the following information to EPA:

- Basic information on each water system, including: name, ID number, number of people served, type of system (year-round or seasonal), and source of water (ground water or surface water)
- Violation information for each water system: whether it has followed established monitoring and reporting schedules, complied with mandated treatment techniques, or violated any Maximum Contaminant Levels (MCLs)
- Enforcement information: what actions states have taken to ensure that drinking water systems return to compliance if they are in violation of a drinking water regulation
- Sampling results for unregulated contaminants and for regulated contaminants when the monitoring results exceed the MCL

EPA uses this information to determine if and when it needs to take action against non-compliant systems, oversee state drinking water programs, track contaminant levels, respond to public inquiries, and prepare national reports. EPA also uses this information to evaluate the effectiveness of its programs and regulations, and to determine whether new regulations are needed to further protect public health.

II-A.1 Federally Reported Violations

Under SDWIS/FED reporting, states only report when violations occur. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule, whether included in the accompanying table or not, is a basis for a state or federal enforcement action.

Table II-1 summarizes the violation and contaminant codes that will be used to report violations of the Stage 1 DBPR to SDWIS/FED.

Table II-1: SDWIS/FED Codes for Federal Reporting Under the Stage 1 DBPR

Violation Code	Contaminant Code	MCL and MRDL Violations
02	1009	Chlorite
	1011	Bromate
	2456	Haloacetic Acids
	2950	Total Trihalomethanes
11 ¹	1006	Chloramines
	1008	Chlorine Dioxide (Acute and Non-Acute)
	0999	Chlorine
Treatment Technique (TT) Violations		
37	0400	Failure to submit/obtain state approval for significant treatment modifications
12	0400	Failure to have qualified operator
46	2920	Failure to meet DBP precursor removal (TOC)
Monitoring and Reporting (M/R) Violations		
27 ²	0400	Major: Failure to develop, implement, or submit monitoring plan
	1011	Major: Failure to collect and report 100% of required bromate samples
	2920	Major: Failure to collect source and finished water TOC/alkalinity samples
	appropriate MCL/MRDL contaminant code	Major: Failure to collect and report at least 90% of required samples (except for bromate)
		Minor: Collecting and reporting between 90-99% of required samples (except for bromate)
Public Notification (PN) Violations*		
06	appropriate MCL/MRDL/ TOC contaminant code	Failure to notify public after a violation

* The revised PN rule (65 FR 25981) is effective May 6, 2002 and will supercede the PN violation listed above.

Table II-2 contains the federally reportable violations for the Stage 1 DBPR in more detail. These violations are listed by contaminant or requirement and violation type. The table includes the SDWIS/FED reporting codes, the regulatory citation, system type affected, a detailed description of the violation, and the initial compliance date. This table will allow a user to better understand violations listed in SDWIS. For more information on how to report Stage 1 DBPR violations to SDWIS, please refer to the *State Reporting Guidance for the Stage 1 Disinfectants and Disinfection Byproducts Rule* which will be available at www.epa.gov/safewater/mdbp/implement.html in fall 2001.

¹Flag used to denote acute or non-acute for chlorine dioxide

²Flag used to denote major or minor.

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Table II-2: Federally Reported Violations for the IESWTR

MCL Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
02/1011	Bromate	§141.64(a)	MCL	All systems using ozone for disinfection or oxidation	If the running annual average computed quarterly of monthly samples exceeds the MCL 0.010 mg/L	January 1, 2002 January 1, 2004
02/1009	Chlorite	§141.64(a)	MCL	All systems using chlorine dioxide for disinfection or oxidation	If the average of any three sample set, exceeds the MCL of 1.0 mg/L.	January 1, 2002 January 1, 2004
02/2456	HAA5	§141.64(a)	MCL	All systems	If the running annual average computed quarterly of quarterly averages of available samples exceed 0.060 mg/L for HAA5	January 1, 2002 January 1, 2004
02/2950	TTHM	§141.64(a)	MCL	All systems	If the running annual average computed quarterly of quarterly averages of available samples exceed 0.080 mg/L for TTHM	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

MRDL Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
11/1006	Chloramines	§141.65(a)	MRDL	All systems using chloramines - If systems use both chloramines and chlorine, systems must average all results for compliance	If the annual average, computed quarterly, of monthly averages exceeds 4.0 mg/L (unless increased residual levels in the distribution system address specific microbial contamination problems)	January 1, 2002 January 1, 2004
11/0999	Chlorine	§141.65(a)	MRDL	All systems using chlorine - If systems use both chloramines and chlorine, systems must average all results for compliance	Exceedance of the MRDL for Chlorine: 4.0 mg/L (unless increased residual levels in the distribution system address specific microbial contamination problems)	January 1, 2002 January 1, 2004
11/1008 Acute/Non Acute	Chlorine Dioxide	§141.65(a)	MRDL	All systems using chlorine dioxide for disinfection or oxidation	ACUTE : If any of the three required distribution samples taken on the day following a daily entry point sample MRDL exceedance 0.8 mg/L NON-ACUTE: If any two consecutive daily samples exceed 0.8mg/L and all distribution samples are less than 0.8 mg/L	January 1, 2002 January 1, 2004
11/1008 Acute/Non Acute	Chlorine Dioxide	§141.132(a)	MRDL	All systems using chlorine dioxide for disinfection or oxidation	Failure to collect and report additional samples the day following and MRDL exceedance This is specified in the rule as a MRDL violation.	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Public Notification (Note: The revised PN Rule supercedes §141.32)						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
06/1011 06/1006 06/0999 06/1008 06/1009 06/2456 06/2920 06/2950	Bromate Chloramines Chlorine Chlorine Dioxide Chlorite HAA5 DBP Precursors (TOC) TTHM	§141.32(e)	PN	All systems	Failure to provide timely public notice using the required language for violations of MCLs, MRDLs, treatment techniques, or variance/exemption schedules, and/or failure to give a copy of the most recent PN for any outstanding violation of any MCL, MRDL, treatment technique, or variance/exemption schedule to all billing units or new hookups prior to or at the time service begins	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Treatment Technique Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
37/0400	TTHM	§141.30(f)	TT	All Subpart H systems that add disinfectant	Failure to submit and obtain state approval of a plan detailing significant treatment process modifications prior to making such modifications	February 1999
12/0400	Treatment Plant Operators	§141.130(c)	TT	All CWSs and NTNCWSs which add a chemical disinfectant	Failure to have a state-approved and listed qualified operator running the plant	January 1, 2002 January 1, 2004
46/2920	DBP Precursors (TOC)	§141.135	TT	All Subpart H systems that use conventional filtration	Failure to meet the Treatment Technique requirements for DBP precursor removal	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Monitoring and Reporting Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
27/0400	Monitoring Plan	§141.132(a)(3)	M/R Major	All CWSs and NTNCWSs which add a chemical disinfectant	Failure to develop, within thirty days of the initial compliance dates, implement and monitor in accordance with the monitoring plan.	January 1, 2002 January 1, 2004
27/0400	Monitoring Plan	§141.132(f) §141.134(a)	M/R Major	Subpart H Systems serving over 3,300 people	Failure to submit a copy of the monitoring plan to the state no later than the date of the first report required under §141.34	January 1, 2002 January 1, 2004
27/1006	Chloramines	§141.132(c)(1)	M/R Major	All systems using chloramines	Failure to collect and report <i>at least</i> 90 percent of samples (taken at same time and location as total coliform samples), failure to monitor using the EPA-approved monitoring & analytical methods and certified labs, and/or failure to report within 10 days after the end of the applicable reporting period.	January 1, 2002 January 1, 2004
			M/R Minor		Collecting and reporting between 90 - 99 percent, or Failure to monitor using the EPA-approved monitoring & analytical methods and certified labs, and report <u>between 90% and 99% of all required results and information</u> within 10 days after the end of the applicable reporting period, for the applicable contaminant.	

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Monitoring and Reporting Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
27/1011	Bromate	§141.132(b)(3)	M/R Major	All systems using ozone for disinfection or oxidation	Failure to collect and report 100% of required samples: 1/month/plant on routine monitoring or 1/plant/quarter on reduced monitoring (system must revert to routine if running annual ave. source water bromide \leq 0.05mg/L)	January 1, 2002 January 1, 2004
27/0999	Chlorine	§141.132(c)(1)	M/R Major	All systems using chlorine	Failure to collect and report <i>at least</i> 90 percent of samples (taken at same time and location as total coliform samples)	January 1, 2002 January 1, 2004
			M/R Minor		Collecting and reporting between 90 - 99 percent.	
27/1008	Chlorine Dioxide	§141.132(c)(2)	M/R Major	All systems using chlorine dioxide for disinfection or oxidation - systems may not reduce chlorine dioxide monitoring	Failure to collect and report <i>at least</i> 90 percent of required samples.	January 1, 2002 January 1, 2004
			M/R Minor		Collecting and reporting between 90 - 99 percent.	

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Monitoring and Reporting Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
27/1009	Chlorite	§141.132(b)(2)	M/R Major	All CWS and NTNCWS using chlorine dioxide for disinfection or oxidation - systems may not reduce daily Chlorite, but can reduce monthly three sample set in distribution system to quarterly. Systems must revert to routine if any distribution sample exceeds MCL of 1.0mg/L.	Failure to collect and report <i>at least</i> 90 percent of daily samples at the entrance to the distribution system and monthly three set samples in distribution system.	January 1, 2002 January 1, 2004
			M/R Minor		Collecting and reporting between 90 - 99 percent.	
27/2920	DBP Precursors	§141.132(d)(1)	M/R Major	All Subpart H systems that use conventional filtration - Systems can remain on reduced monitoring as long as annual average treated TOC does not exceed 2.0 mg/L	Failure to collect source and finished water TOC samples and Alkalinity sample (at the same time as source water TOC sample) - 1/month/plant on routine monitoring or 1/quarter/ Plant on reduced monitoring.	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

TTHM/HAA5 Monitoring and Reporting Violations by System Size

Monitoring and Reporting Violations Subpart H serving at least 10,000 people						
27/2456 27/2950	HAA5 TTHM	§141.132	M/R Major	Subpart H serving at least 10,000 people - Systems on reduced must revert to routine if annual average exceeds 0.060 mg/L for TTHM or 0.045 mg/L HAA5	Failure to collect and report <i>at least</i> 90 percent of required samples: Routine = 4/quarter/plant Reduced = 1/quarter/plant	January 1, 2002
			M/R Minor		Collecting and reporting between 90 - 99 percent of required samples	
Monitoring and Reporting Violations Subpart H serving 500 to 9,999 people						
27/2456 27/2950	HAA5 TTHM	§141.132	M/R Major	Subpart H serving 500 to 9,999 people - Systems on reduced must revert to routine if annual average exceeds 0.060 mg/L for TTHM or 0.045 mg/L HAA5	Failure to collect and report <i>at least</i> 90 percent of required samples: Routine = 1/quarter/plant Reduced = 1/year/plant during month of warmest water temperature	January 1, 2004
			M/R Minor		Collecting and reporting between 90 - 99 percent of required samples.	
Monitoring and Reporting Violations Subpart H serving fewer than 500 people						
27/2456 27/2950	HAA5 TTHM	§141.132	M/R Major	Subpart H serving fewer than 500 people - There is no reduced monitoring	Failure to collect and report <i>at least</i> 1 sample per plant per year during the month of warmest water temperature	January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

<p align="center">Monitoring and Reporting Violations Ground water serving at least 10,000 people</p>						
27/2456 27/2950	HAA5 TTHM	§141.132	M/R Major	Ground water serving at least 10,000 people - Systems on reduced must revert to routine if the annual average exceeds 0.060 mg/L for TTHM or 0.045 mg/L HAA5	Failure to collect and report <i>at least</i> 90 percent of required samples: Routine = 1/quarter/plant Reduced =1/year/plant during the month of warmest water temperature	January 1, 2004
			M/R Minor			
<p align="center">Monitoring and Reporting Violations Ground water serving fewer than 10,000 people</p>						
27/2456 27/2950	HAA5 TTHM	§141.132	M/R Major	Ground water serving fewer than 10,000 people - If any sample exceeds 0.060 mg/L for TTHM or 0.045 mg/L HAA5 system must increase to quarterly monitoring	Failure to collect and report <i>all required samples</i> : Routine = <i>at least</i> 1 sample per plant per year during the month of warmest water temperature Reduced = <i>at least</i> 1 sample per plant per 3-year cycle	January 1, 2004

II-B. SNC Definitions for the Stage 1 DBPR

Significant noncompliers (SNCs) are community, non-transient non-community and transient non-community water systems that have more serious, frequent, or persistent violations. The criteria which designate a system as a SNC vary by contaminant. Once a system is designated as a SNC, it is subject to EPA's timely and appropriate policy. SNCs that have not returned to compliance or are not addressed timely and appropriately are called Exceptions. Timeliness for SNCs is eight months after the system became a SNC. (Two months for the state to determine, and become aware of, the system's SNC status and six months in which to complete the follow-up/enforcement action). The types of actions considered appropriate include the issuance of a formal state or federal administrative or compliance order, a civil or criminal referral to state Attorney General or Department of Justice, or state bilateral compliance agreement signed by both the state and the violator.

The following are SNC definitions for the Stage 1 DBPR. The requirements of the Stage 1 DBPR prescribe different monitoring frequencies depending on the constituent (e.g. chlorine, TTHM/HAA5, TOC). The following definition categorizes SNC based on the frequency of monitoring. In many cases, a system will be monitoring at multiple frequencies (i.e. monthly sampling for TOC and chlorine, quarterly for TTHM and HAA5). To determine if a system is a SNC, the violations for like monitoring frequencies are added together. For example, System A received a MRDL violation for chlorine (monthly monitoring), one treatment technique violations for DBP precursors (monthly monitoring), and two major M/R violations for failing to collect all monthly TOC monitoring. System A has triggered the quarterly SNC definition.

MONTHLY (or more frequent) MONITORING (excluding chlorine dioxide)

- C A system that has a combination of four (4) or more MCL or MRDL violations in any 12 consecutive months.
- C A system that has a combination of six (6) or more MCL or MRDL violations and Major M/R violations in any 12 consecutive months.
- C A system that has a combination of ten (10) or more MCL or MRDL violations, Major M/R violations, and Minor M/R violations in any 12 consecutive months.

QUARTERLY MONITORING

- C A system that has a combination of two (2) or more MCL violations, MRDL violations, TT violations, and Major M/R violations in any 12 consecutive months.
- C A system that has a combination of three (3) or more MCL violations, MRDL violations, TT violations, Major M/R violations, and Minor M/R violations in any 12 consecutive month.

YEARLY OR LESS MONITORING

- C A system which fails to collect and report all required sample(s).

Note: A system which has one (1) MCL violation in any compliance cycle converts to quarterly monitoring (§141.133(b)(1)(ii)). Please refer to SNC definition for systems monitoring quarterly.

CHLORINE DIOXIDE:

- C A system that has four (4) non-acute chlorine dioxide violations in any 12 consecutive months.
- C A system that has one (1) acute chlorine dioxide MRDL violation in any 12 consecutive months.

TTHM

- C Failure to obtain state approval before making any significant modification to its existing treatment process (§141.30(f)).

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Section III.

State Primacy Revision Applications

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Changes to the Primacy Revision Process

40 CFR 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 §1413 of the Safe Drinking Water Act (SDWA). The 1996 SDWA Amendments create an additional requirement and modify 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).

For consistency with the Amendments to §1413, the Primacy Rule makes the following changes to the existing regulations in 40 CFR 142:

- 1) **Administrative Penalty Authority**—As a condition of primacy, states must now have administrative penalty authority for all violations of their approved primacy program, unless prohibited by the states' constitution. This encompasses applicable requirements in 40 CFR 141 and 142 including, but not limited to, National Primary Drinking Water Regulations, variances and exemptions, if applicable, and public notification requirements.
- 2) **Interim Primacy**—The Primacy Rule also codifies the new process which grants primary enforcement authority to states while their applications to modify their primacy programs are under review (interim primacy). New section 142.12(e) explains that any state already having primacy for all existing national primary drinking water regulations in effect when a new regulation is promulgated is considered to have interim primacy for a new or revised regulation, once it has submitted a complete and final primacy revision application. This interim enforcement authority begins on the date of submission of a complete and final primacy revision application or the effective date of the new or revised state regulation, whichever is later, and ends when EPA makes a final determination.
- 3) **Time increases for rule adoptions**—The rule also increases the time for a state to adopt new or revised federal regulations from 18 months to 2 years.
- 4) **Examples of emergencies**—Finally, the Primacy Rule adds examples of circumstances that require an emergency plan for the provision of safe drinking water. Emergencies include earthquakes, floods, hurricanes, and other natural disasters.

For consistency with the Amendments to §1401(4), the Primacy Rule expands the definition of a public water system (PWS) to include not only systems which provide water for human consumption through pipes, but also systems which provide water for human consumption through “other constructed conveyances.”

III-A. 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 Administrator no later than 2 years after promulgation of the new or revised federal regulations (see Table III-1). Until those applications are approved, EPA Regions have responsibility for directly implementing the IESWTR and the Stage 1 DBPR. The state and EPA can agree to implement the rule together during this period. However, if a state is eligible for interim primacy, once it submits a complete and final revision package, it will have full implementation and enforcement authority. A state may be granted additional time, up to two years, to submit its application package. During this period, an extension agreement outlining the state's and EPA's responsibilities is required.

Table III-1: State Rule Implementation and Revision Timetable

EPA/State Action	Time Frame
Rules published by EPA	December 16, 1998
State and Region establish a process and agree upon a schedule for application review and approval	May 1999
State, at its option, submits draft program revision package including: Preliminary Approval Request Draft state Regulations and/or Statutes Regulation Crosswalk	September 1999 (Suggested)
Regional (and Headquarters if necessary) review of draft	Completed within 90 days of state submittal of Draft
State submits final program revision package including: Adopted state Regulations Regulation Crosswalk 40 CFR 142.10 Primacy Update Checklist 40 CFR 142.14 and 142.15 Reporting and Recordkeeping 40 CFR 142.16 Special Primacy Requirements Attorney General's Enforceability Certification	By September 16, 2000*
EPA final review and determination: Regional review (program and ORC) Headquarters concurrence and waivers (OGWDW, OECA, OGC) Public Notice Opportunity for hearing EPA's Determination	Completed within 90 days of state submittal of final 45 days Region 45 days Headquarters
Rule Effective Date	Systems serving \geq 10,000 people January 1, 2002 Systems serving \leq 10,000 people January 1, 2004

* EPA suggests submitting an application by September 2000, to ensure timely approval. EPA regulations allow until December 16, 2000 for this submittal. An extension of up to 2 additional years may be requested by the state.

III-A.1 The Revision Process

The approval of state program revisions is recommended to be a two-step process comprised of submission of a draft request (optional) and then submission of a complete and final request for program approval. Figure III-1 diagrams these processes and their timing.

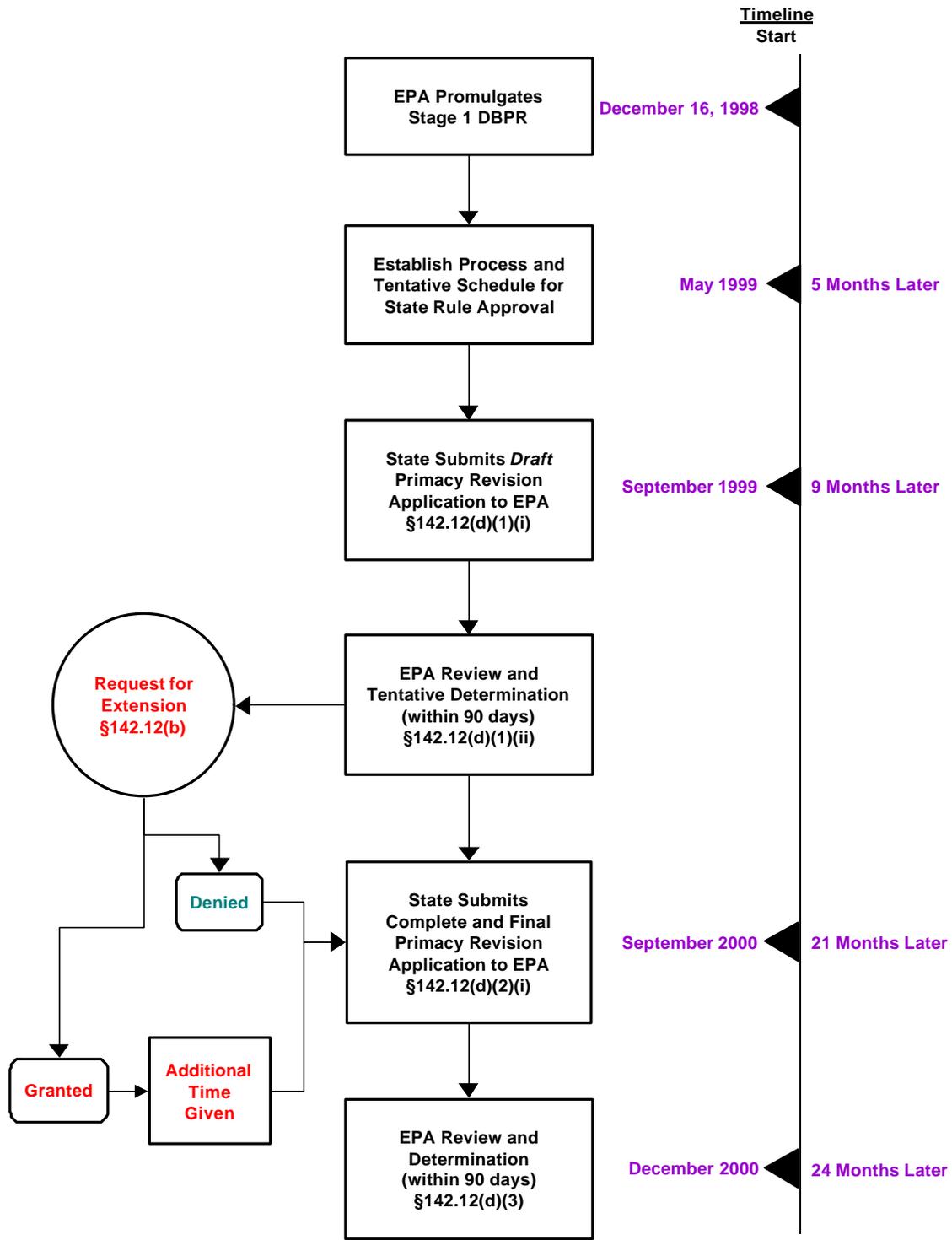
Draft Request—At the state’s option, it may submit a draft request for EPA review and tentative determination. The request should contain drafts of all required primacy application materials. A draft request should be submitted by 9 months after rule promulgation. EPA will make a tentative determination on whether the state program meets the applicable requirements. The tentative determination should be made 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. If the state has submitted a draft request for EPA review, the state must address any comments and/or program deficiencies identified in the tentative determination in their final submission. Regions should make states aware that submission of only a final request may make it more difficult for the states to address any necessary changes within the allowable time for state rule adoption.

EPA requests that states submit their complete and final revision package within 21 months of rule promulgation. This will ensure that states will have interim primacy within 24 months and will prevent states from becoming backlogged with 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.

Figure III-1: Recommended Review Process for State Request for Approval of Program Revisions



III-A.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 of the revised program. The Offices of Ground Water and Drinking Water (OGWDW) and Enforcement and Compliance Assurance (OECA) will conduct detailed reviews of the first state package from each Region. The Region should submit their comments with the state's package for Headquarter's review. When the Region has identified all significant issues, OGWDW and OECA will waive concurrence on all other state programs in that Region, although HQ will retain the option to review additional state programs with cause. 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 Headquarters' review, the review period will be equally split giving both the Regions and Headquarters 45 days to conduct their respective reviews. For the first package in each Region, Regions should forward copies of the primacy revision applications and their comments to the director of the Drinking Water Protection Division (DWPD) in OGWDW. The DWPD Director will take the lead on the review process. OGWDW will provide OECA with a copy for their concurrent review. OECA will concur on OGWDW approvals.

III-B. State Primacy Program Revision Extensions (40 CFR 142.12 (b))

III-B.1 The Extension Process

Under §142.12(b), states may request that the 2-year deadline for submitting the complete and final request 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. Headquarters concurrence on extensions is not required.

III-B.2 Criteria that an Extension Request Must Meet

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, 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; or,
- (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.

III-B.3 Conditions of the Extension

If an extension is granted, the Region and state will negotiate certain conditions that must be met during the extension period. 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. Appendix B contains a sample extension agreement.

Conditions of an extension agreement may include:

- C Informing PWSs of the new EPA (and upcoming state) requirements and 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;
- C Collecting, storing and managing laboratory results, public notices, and other compliance and operation data required by the EPA regulations;
- C Assisting the Region in the development of the technical aspects of enforcement actions and conducting informal follow-up on violations (telephone calls, letters, etc.);
- C Providing technical assistance to public water systems;
- C 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 during the extension period to remedy the deficiency;
- C Providing the Region with all the information required under §142.15 on state reporting.

Figure III-2 provides a checklist the Region can use to review state extensions.

Figure III-2: Extension Request Checklist

I. Reason for State Request

- Clustering of Program Revisions
- Statutory Barrier
- Regulatory Barrier
- Lack of Program Capability
 - Insufficient Resources
 - Funding Level
 - Staffing
 - Lack of Adequately Trained Staff
 - Inadequate Procedures, Guidelines, and Policies
- Other _____

II. Actions Taken by the State to Justify an Extension

- | | Schedule Dates
(or attachments) |
|--|------------------------------------|
| <input type="checkbox"/> Seeking Increases in Program Resources | _____ |
| <input type="checkbox"/> Training Existing Personnel/Revising Training Programs | _____ |
| <input type="checkbox"/> Revising State Regulations or Statutes | _____ |
| <input type="checkbox"/> Developing Revised/New Procedures, Guidelines, Policies | _____ |
| <input type="checkbox"/> Other _____ | _____ |
| _____ | |

III. Extension Decision

- Extension Request Approved Date: / /
 - Period of Extension Request: / / to / /
- Extension Request Denied Date: / /
 - Reason Cited: _____

IV. Conditions of the Extension

During the extension period the state will (check all that apply):

- Inform public water systems of the new requirements and the fact that EPA will be overseeing their implementation until the state's program is approved or submitted if state qualifies for interim primacy
- Collect and store laboratory results and other compliance data
- Provide technical assistance to public water systems
- Provide EPA with the information required under section 142.15 of the primacy rule
- Other _____

III-C. State Primacy Package

The primacy revision application package should consist of the following sections:

III-C.1 Section I—The State Primacy Revision Checklist (40 CFR 142.10)

This section is a checklist of general primacy requirements, taken from 40 CFR 142.10, as shown in Table III-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 second column next to the list of program elements and should submit appropriate documentation. For elements that need not be revised, the state need only list the citation and date of adoption in the second column. During the application review process, EPA will insert findings and comments in the third column.

Table III-2: State Primacy Revision Checklist

Required Program Elements		Revision to State Program	EPA Findings/Comments
§142.10	Primary Enforcement – Definition of Public Water System*		
§142.10(a)	Regulations No Less Stringent		
§142.10(b)(1)	Maintain Inventory		
§142.10(b)(2)	Sanitary Survey Program		
§142.10(b)(3)	Laboratory Certification Program		
§142.10(b)(4)	Laboratory Capability		
§142.10(b)(5)	Plan Review Program		
§142.10(b)(6)(i)	Authority to apply regulations		
§142.10(b)(6)(ii)	Authority to sue in courts of competent jurisdiction		
§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		
§142.10(b)(6)(vii)	Authority to require CWSs to provide 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*		

* New requirement from the 1996 Amendments. Regulations published in the April 28, 1998 *Federal Register*.

** New regulations published in the August 14, 1998 *Federal Register*.

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 CFR 142.2 and 142.10. Failure to revise primacy for these new provisions can affect primacy for the Stage 1 DBPR. However, states may still receive primacy for the Stage 1 DBPR even if they have not yet revised their base program to comply with the new statutory requirements provided that the time to adopt these requirements (including the extension period if applicable) has not expired (April 2000 and April 2002 with extension).

Rule Bundling—States may bundle the new PWS definition, administrative penalty authority, variance and exemption requirements or any other drinking water regulation with the Stage 1 DBPR primacy revision packages so long as the submittal date (two years plus two year extension) has not lapsed. If states choose to bundle these requirements, the state needs to include the text of the state regulation/statute. The Attorney General statement should reference these new requirements.

III-C.2 Section II—Text of the State’s Regulation (40 CFR 142.11)

Each primacy application package must include the text of the state regulation.

III-C.3 Section III—Primacy Revision Crosswalk

The Primacy Revision Crosswalk, found 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.”

III-C.4 Section IV—State Reporting and Recordkeeping Checklists (40 CFR 142.14 and 142.15)

This section addresses state reporting and recordkeeping requirements. The state should use these checklists to explain how state reporting and recordkeeping requirements are consistent with federal requirements. If state requirements are inconsistent with federal requirements, the state must explain how its requirements are “no less stringent” as per §142.10. The checklist for the Stage 1 DBPR is presented in Table III-3.

Table III-3: Reporting and Recordkeeping Checklist for the Stage 1 DBPR

Requirement	Are state policies consistent with federal requirements? If not, please explain.
Each state that has primary enforcement responsibility must keep records of currently applicable or most recent state determinations including all supporting information and an explanation of the technical basis for each decision made under 40 CFR 141 subpart L for the control of disinfectants and disinfection byproducts; records must also include interim measures toward installation.	
Each state that has primary enforcement responsibility must keep records of systems that are installing GAC or membrane technology in accordance with §141.64(b)(2); records must include date by which the system is required to have completed installation.	

Requirement	Are state policies consistent with federal requirements? If not, please explain.
Each state that has primary enforcement responsibility must keep records of systems that are required by the state to meet alternative minimum TOC removal requirements or for whom the state has determined that the source water is not amenable to enhanced coagulation in accordance with §141.135(b)(3) and (4); records must include the alternative limits and the rationale for establishing alternative limits.	
Each state that has primary enforcement responsibility must keep records of Subpart H systems using conventional treatment meeting any of the alternative compliance criteria in §141.135(a)(2) or (3).	
Each state that has primary enforcement responsibility must keep a register of qualified operators that have met the state requirements developed under §142.16(f)(2).	
Each state that has primary enforcement responsibility must keep records of systems with multiple wells considered to be 1 treatment plant in accordance with §141.132(a)(2) and §142.16(f)(5).	
Each state that has primary enforcement responsibility must keep monitoring plans for Subpart H systems serving more than 3,300 people in accordance with §141.132(f).	
Each state that has primary enforcement responsibility must keep a list of laboratories approved for analyses in accordance with §141.131(b).	
Each state that has primary enforcement responsibility must keep a list of systems required to monitor for disinfectants and disinfection byproducts in accordance with 141 subpart L; list must indicate what disinfectants and DBPs other than chlorine, TTHM, and HAA5, if any, are measured.	

III-C.5 Section V—Special Primacy Requirements (40 CFR 142.16)

See section D. This section provides guidance on how states may choose to meet each special primacy requirement.

III-C.6 Section VI—Attorney General’s Statement of Enforceability (40 CFR 142.11)

The complete and final primacy revision application must include an Attorney General statement certifying that the state regulations were duly adopted and are enforceable. The Attorney General 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 Safe Drinking Water Act. 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 statement is presented in Figure III-3.

Figure III-3: Example of Attorney General 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.

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 the Safe Drinking Water Act. 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 2/14/97 (See Appendix C) in determining 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.

Model Language

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.

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 (3) ability 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 (3) ability 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 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

III-D. Guidance for Special Primacy Requirements

This section contains guidance states can use when addressing the special primacy requirements of 40 CFR 142.16. It specifically addresses the special primacy conditions added for implementation of the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). The guidance in Section III-D.1 addresses special primacy conditions in the same order that they occur in the rule. Guidance for provisions not included as special primacy requirements may be found in section III-D.2.

States should note that, in several sections, the guidance makes suggestions and offers alternatives that go beyond the minimum requirements indicated by reading the subsections of §142.16. EPA does this to provide states with information and/or suggestions that may be helpful to states' implementation efforts. 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.

III-D.1 Special Primacy Requirements—Stage 1 DBPR

§142.16 Special primacy requirements (h)(1): *Section 141.64(b)(2) of this chapter (interim treatment requirements). Determine any interim treatment requirements for those systems electing to install GAC or membrane filtration and granted additional time to comply with §141.64 of this chapter.*

Guidance

Under §141.64(b)(2) of the Stage 1 Disinfectants and Disinfection Byproducts Rule, a system that is installing GAC or membrane technology to comply with the MCLs for disinfection byproducts may apply to the state for an extension of up to 24 months (but not beyond December 31, 2003) for compliance with MCLs. This provision only applies to subpart H systems¹ that serve 10,000 or more people, since all other affected systems have up to 60 months to comply.

States which grant MCL extensions will need to establish an extension conditions for the requesting system. While states are only required to address how they will determine interim treatment requirements to satisfy the special primacy condition, guidance is also provided below on a range of possible extension conditions for the state's reference.

Interim measures

EPA believes that it is important for states to consider each system's potential for achieving meaningful overall risk reduction through reasonable interim treatment requirements. In their applications for program revision, states must explain how they will determine interim treatment requirements they may choose to mandate.

In making these determinations, states may wish to:

- Examine monitoring data
- Examine current treatment practices
- Examine current plant infrastructure

¹The rule defines subpart H systems as systems that use surface water or ground water under the direct influence of surface water as a source.

Some possible treatment measures that states may wish to consider (if appropriate) include the following:

- C Moving the point of disinfectant application.
- C Treatment changes designed for better disinfection byproduct precursor removal.
- C Changing of primary and/or secondary disinfectants.
- C Adjusting disinfection dose based on temperature and/or pH.
- C Changing pH to reduce DBP formation.
- C Implementation of a main flushing program in areas with high detention times and/or biofilm problems.

EPA strongly recommends states evaluate all potential interim treatment requirements in terms of their impact on not only disinfection byproduct formation, but also microbial protection, corrosion control, and other public health issues. Additional guidance and case studies are presented in the “Microbial and Disinfection Byproduct Rules Simultaneous Compliance Guidance Manual,” USEPA, August 1999, (EPA-815-R-99-015) and is available at EPA web site: www.epa.gov/safewater/mdbp/implement.html.

Qualifying for an extension

Section 141.64(b)(2) allows a system that is installing GAC or membrane technology, to comply with the DBP MCLs, to apply to the state for an extension for compliance of up to two years. The rule sets no criteria for this extension. However, states may wish to establish criteria such as the following for systems to qualify for an extension:

- C Demonstrate, through monitoring data, a need for an extension to comply with Stage 1 DBP MCLs.
- C Show that the scope and/or complexity of the capital improvements warrant the length of the extension. (i.e. Extensions would be granted for only the period necessary to install the required capital improvements.

Section 141.64 (b)(2) was intended to facilitate compliance through a reduction in DBP precursors. An additional aspect of that intent was to allow utilities to move beyond the Stage 1 Disinfectants and Disinfection Byproducts Rule (DBPR) MCLs to Stage 2 targets. The Federal Advisory Committee Agreement in Principle, signed in September 2000, recommended that compliance with Stage 2 DBPR TTHM and HAA5 MCLs be determined based on a Locational Running Annual Average (LRAA) - a running annual average must be calculated at each sample location.

Extension conditions

Extension conditions for systems must require:

- C Compliance schedules with milestones (including construction-based milestones). Failure to meet the schedule or interim treatment requirements is a violation of a National Primary Drinking Water Regulation.

Other extension conditions may include:

- C Timely progress reports following each milestone date.
- C Compliance with interim measures for public health protection as determined by the state.
- C Notice of the extension in the annual Consumer Confidence Report.
- C Reporting in the annual Consumer Confidence Report of the monitoring results for the contaminant for which the extension was granted.
- C Adherence to Public Notice requirements if the MCL for which the extension was granted is exceeded.
- C A consideration for publishing a “Notice of Availability” of a public hearing or requiring the PWS to do so.

References for more detailed guidance

1. Microbial and Disinfection Byproduct Rules Simultaneous Compliance Guidance Manual, USEPA, August 1999 (EPA 815-R-99-015).
Available from:
www.epa.gov/safewater/mdbp/implement.html; and
Safe Drinking Water Hotline: 1-800-426-4791
2. Alternative Disinfectants and Oxidants Guidance Manual, USEPA, April 1999 (EPA 815-R-99-014).
Available from:
www.epa.gov/safewater/mdbp/implement.html; and
Safe Drinking Water Hotline: 1-800-426-4791
3. Chloramination for THM Control: Principles and Practices, American Water Works Association Seminar Proceedings, 1984 Annual Conference.
Available from:
AWWA
6666 West Quincy Avenue
Denver, CO 80235
Phone: 1-800-926-7337

§142.16 Special primacy requirements. (h)(2): *Section 141.130(c) of this chapter (qualification of operators). Qualify operators of public water systems subject to 40 CFR part 141, subpart L. Qualification requirements established for operators of systems subject to 40 CFR part 141, subpart H—Filtration and Disinfection may be used in whole or in part to establish operator qualification requirements for meeting 40 CFR part 141, if the state determines that the subpart H requirements are appropriate and applicable for meeting subpart L requirements.*

Guidance

Section 141.130(c) requires that each community water system (CWS) and nontransient noncommunity water system (NTNCWS) regulated under the Stage 1 DBPR be operated by qualified personnel. Since the Stage 1 DBPR also regulates TNCWSs using chlorine dioxide, states should also consider requiring qualified operators in this system category as well.

States are given the discretion to determine the standards for operator qualifications. Under 40 CFR Part 141, Subpart H—Filtration and Disinfection, states were required to qualify operators of systems as a condition for primacy for systems covered under the SWTR. The new Stage 1 DBPR allows states to continue to use these procedures to qualify operators if the state determines that these requirements are appropriate and applicable to the set of systems covered by the Stage 1 DBPR.

The guidance for the SWTR operator personnel qualifications recommends that plant operators have a basic knowledge of science, mathematics, and chemistry involved with water treatment and supply. In this case, the state primacy application should contain a description of the SWTR procedure, how it will cover all affected PWSs, and the rationale for determining that the procedure is appropriate and applicable.

Additionally, under section 1419 of the SDWA, EPA was required to develop guidelines for the certification and re-certification of operators of community and nontransient noncommunity water systems. In consultation with states, final guidelines were developed and published in the *Federal Register* on February 5, 1999. States are required to adopt and implement an operator certification program which meets EPA's guidelines in order to avoid a withholding from their state revolving fund. Each state operation certification program must include, as a minimum, the essential elements of 9 baseline standards. These include: authorization; classification of systems, facilities, and operators; operator qualifications; enforcement; certification renewal; resources needed to implement the program; re-certification; stakeholder involvement; and program review. State operator certification programs that follow these guidelines will also be deemed to meet this special primacy requirement.

The state can also identify alternate programs they will use to qualify operators. In general, operator certification programs should consider indicators of public health risks, such as the complexity, size, and source water for treatment facilities, and the complexity and size of distribution systems when classifying and setting standards for system types and sizes.

Operators should have an understanding of the following areas:

- C The principles of water treatment and distribution and their characteristics.
- C The uses of potable water and variations in its demand.
- C The importance of water quality to public health.
- C The equipment, operation, and maintenance of the distribution system.
- C The treatment process equipment used, its operational parameters, and maintenance.
- C The principles of each unit.
- C Performance criteria to determine operational adjustment.

- C Common operating problems.
- C Current regulations and monitoring requirements.
- C Methods of sample collection and sample preservation.
- C Laboratory equipment and tests used to analyze samples.
- C Use of laboratory results to analyze plant efficiency.
- C Recordkeeping.
- C Customer relations.
- C Budgeting and supervision.

References for more detailed guidance

1. Guidance Manual for Compliance With the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources, American Water Works Association, 1990

Available from:

AWWA
6666 West Quincy Avenue
Denver, CO 80235

2. Guidelines for the Certification and Recertification of the Operators of Community and Nontransient Noncommunity Public Water Systems, February 5, 1999 (64 FR 5915).

Available from:

<http://www.epa.gov/safewater/opcert/opcerta.htm>; and
Safe Drinking Water Hotline: 1-800-426-4791

§142.16 Special primacy requirements. (h)(3): *Section 141.131(c)(2) of this chapter (DPD colorimetric test kits). Approve DPD colorimetric test kits for free and total chlorine measurements. state approval granted under §141.74(a)(2) of this chapter for the use of DPD colorimetric test kits for free chlorine testing is acceptable for the use of DPD test kits in measuring free chlorine residuals as required in 40 CFR part 141, subpart L.*

Guidance

Section 141.131(c)(2) of the Stage 1 DBPR offers states the discretion to allow systems to use DPD colorimetric test kits for measuring residual levels for chlorine, chloramines, and chlorine dioxide. The residual measurements may then be used for compliance determinations in regard to CT requirements and maximum residual disinfectant levels (MRDLs). EPA recommends that states address the issue directly in their rules. They may wish to do this by simply adding DPD colorimetric test kits as one of the approved methods for disinfectant residual compliance monitoring or by clearly stating such kits are not approved for this purpose. When DPD test kits are approved, the state may need to establish procedures that systems must follow for making dilutions of water samples that contain chlorine concentrations that are greater than the range of the colorimetric test kit.

To meet the terms of this special primacy condition, states need only explain how the issue is addressed in their rules or other authorities, cite the relevant sections, and include copies of those rules or authority in their primacy revision applications.

142.16 Special primacy requirements. (h)(4): *Sections 141.131(c)(3) and (d) of this chapter (state approval of parties to conduct analyses). Approve parties to conduct pH, bromide, alkalinity, and residual disinfectant concentration measurements. The state's process for approving parties performing water quality measurements for systems subject to 40 CFR part 141, subpart H requirements in paragraph (b)(2)(i)(D) of this section may be used for approving parties measuring water quality parameters for systems subject to subpart L requirements, if the state determines the process is appropriate and applicable.*

Guidance

Sections 141.131(c)(3) and (d) of the Stage 1 DBPR require systems to have analyses for disinfectant residuals, pH, bromide, alkalinity, UVA and TOC conducted by parties approved by the state or EPA. The approved parties could include, but would not be limited to, EPA- or state-certified laboratories. In addition, the technical corrections (66 FR 3770) requires daily chloride samples at the entrance to the distribution system to also be measured by a party approved by EPA or the state. It is suggested that the state's process for approval of parties cover daily chloride sampling as well. To meet this special primacy requirement, states must describe how they will approve parties to conduct these measurements. The process described by the state should ensure that the measurements are reliable and accurate. To achieve this, the tests should be conducted by personnel who have adequate training and experience and who are properly equipped. Therefore, the primacy revision application should describe the criteria the state will consider, including minimum prerequisite training and laboratory facilities, when granting approvals to parties for conducting the analyses.

States may wish to limit their approvals to certain levels (or classes) of certified operators that have been provided with proper training. For some on-site measurements such as disinfectant residuals, states may determine that it is appropriate for parties to conduct the measurements if they are under the direct supervision of a certified operator.

States were required to develop processes and procedures for approving parties conducting measurements under the SWTR. As mentioned above, if states determine it to be appropriate and applicable, they may use those same processes and procedures to fulfill this special primacy requirement.

142.16 Special primacy requirements. (h)(5): *Section 141.132(a)(2) of this chapter (multiple wells as a single source). Define the criteria to use to determine if multiple wells are being drawn from a single aquifer and therefore be considered a single source for compliance with monitoring requirements.*

Guidance

Section 142.132(a)(2) of the Stage 1 DBPR gives states the discretion to allow PWSs to reduce TTHM and HAA5 monitoring and associated costs by considering multiple wells drawing water from the same aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required. This provision is applicable when there are multiple treatment plants applying the same disinfectant to multiple wells completed in the same aquifer. To qualify for the ability to make this discretionary reduction, states must establish criteria under this special primacy requirement. The criteria adopted by states should be designed to ensure that each well is indeed drawing from the identified aquifer. In addition, the finished water quality characteristics of all wells should be very similar. Thus, the water from the wells should be expected to react alike in terms of formation of disinfection byproducts.

In general, EPA recommends that states require PWSs that are seeking a reduction in monitoring under §141.132(a)(2) to submit an evaluation or study performed by a professional competent in the field of hydrogeology such as a geologist, hydrogeologist, or professional engineer.² The evaluation required by the state should, with reasonable certainty, show all wells are completed in, and drawing water from, the same aquifer and that the water quality characteristics/chemistry of each well are enough alike to conclude disinfection byproduct formation would be very similar.

Some of the criteria states may consider for making these determinations include the following:

Well construction and geology

- C Well locations—the locations of all wells should be marked on topographic maps.
- C Well depths.
- C Well logs—the logs should show the geological strata encountered during well construction, identify water producing zones, screened or slotted sections, and grouting.
- C Static water levels based upon a common elevation point.
- C Aquifer studies and maps.
- C Treatment applied.

Water characteristics and chemistry

- C pH (field).
- C Temperature (field).
- C Specific conductivity.

² Often relevant information can be obtained from the USGS, state geological surveys, or state bureaus of mines and geology.

- C Total organic carbon (TOC).
- C Analyses of common ions with a calculated cation/anion balance (calcium, magnesium, iron, manganese, sodium, sulfate, alkalinity, chloride).

In many cases there may be reports, maps, or studies available from state or federal agencies that will be helpful in making the determinations.

142.16 Special primacy requirements. (h)(6): *Approve alternate minimum TOC removal (Step 2) requirements, as allowed under the provisions of 141.135(b) of this chapter.*

Guidance

Subpart H systems that use conventional filtration treatment are required to operate with enhanced coagulation or enhanced softening to achieve mandatory levels of total organic carbon (TOC) removal unless the system meets one or more of the “alternative compliance criteria” listed in §141.135(a)(2) or (a)(3) of the Stage 1 DBPR. This requirement of §141.135 is designed to provide a level of protection for unknown and/or unregulated disinfection byproducts.

Systems which cannot achieve the Step 1 minimum TOC removal requirements as presented in the table found in §141.135(b)(2) due to water quality parameters or operational constraints must apply to the state for approval of alternative minimum TOC removal (Step 2) requirements. The applications systems make to the state for approval of Step 2 minimum TOC removal requirements must include, as a minimum, results of bench- or pilot-scale testing conducted pursuant to §141.135(b)(4)(i) of the Stage 1 DBPR. Guidance for systems conducting this testing and for states in determining how and under what conditions to approve Step 2 TOC removal requirements, is found in the Guidance Manual for Enhanced Coagulation and Enhanced Softening, USEPA, 1999.

In states’ applications for primacy revision, adequate information must be provided to ensure that approvals for alternative minimum TOC removals (Step 2) will meet the requirements of 141.135(b). The state should describe the process they will use to determine appropriate Step 2 removal requirements.

References for more detailed guidance

1. Enhanced Coagulation and Enhanced Precipitative Softening Guidance Manual, USEPA, May 1999 (EPA 815-R-99-012).

Available from:

www.epa.gov/safewater/mdbp/implement.html; and
Safe Drinking Water Hotline: 1-800-426-4791

III-D.2 Other Requirements in the Stage 1 DBPR

§141.132 (f) Monitoring plans: *Each system required to monitor under this subpart must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the state and the general public no later than 30 days following the applicable compliance dates in §141.130(b). All Subpart H systems serving more than 3300 people must submit a copy of the monitoring plan to the state no later than the date of the first report required under §141.134³. The state may also require the plan to be submitted by any other system. After review, the state may require changes in any plan elements. The plan must include the following elements:*

1. *Specific locations and schedules for collecting samples for any parameters included in this subpart.*
2. *How the system will calculate compliance with MCLs, MRDLs, and treatment techniques.*
3. *If approved for monitoring as a consecutive system, or if providing water to a consecutive system, under the provisions of §141.29, the sampling plan must reflect the entire distribution system.*

Guidance

Section 141.132(f) requires each system to develop and implement a monitoring plan for monitoring that must be performed pursuant to subpart L. Systems must make the plan available for review by the state and public no later than 30 days following the applicable compliance dates (see §141.130(b)). Surface water systems (including GWUDI) serving more than 3,300 people must submit a copy of their monitoring plan with their first monitoring report required under subpart L. States may require other systems to submit copies as well.

The monitoring requirements of the Stage 1 DBPR can be complex; therefore, monitoring plans should be helpful to systems in terms of ensuring compliance. Although there is no special primacy condition related to monitoring plans, EPA believes that limited guidance may be helpful to states.

EPA suggests that states consider developing a procedure for PWSs to follow when preparing the required monitoring plans. The procedure should ensure that systems prepare all plans in a format that is useful to both the systems and the state. Some items states may wish to consider as suggestions (or requirements) for systems to include in their monitoring plans are the following:

- C A cover page that identifies the public water system and includes relevant information such as—
 - C System name
 - C PWSID Number
 - C Address
 - C Contact person and phone number
 - C System type (community, nontransient noncommunity, transient noncommunity)
 - C Population served
 - C Source water information (number and type)
 - C Entry points (tied to source(s))
 - C Treatment provided (tied to sources and entry points)

- C A summary of the subpart L monitoring that will be required of the system, including monitoring for—
 - C Disinfection byproducts

³ §141.134 of the Stage 1 DBPR addresses the reporting and recordkeeping requirements of public water systems. In general, reports are required to be submitted to the state within 10 days after the end of the monitoring period.

- C Disinfectants
- C Disinfection byproduct precursors
- C Schematic drawings of all treatment facilities, including—
 - C Source(s)
 - C Identification of treatment type and purpose
 - C Identification of chemicals applied and points of application
 - C Each unit process of each treatment train (with flow rates)
 - C Sampling points identified and numbered (e.g. T-1, T-2)
- C A schematic drawing of the distribution system (and consecutive systems), including—
 - C Sources
 - C Entry points
 - C Treatment facilities
 - C Storage facilities
 - C Sampling points identified and numbered (e.g. D-1, D-2)
- C A summary of typical system operating characteristics (on a seasonal basis if necessary) explaining how sources are used to meet system demands, where extended residence times⁴ are expected to occur, etc.
- C A schedule for collecting all required samples including frequency and times for collection, sample site identification number, sample handling/preservation requirements, and analysis plan for each sample (on site analysis, certified laboratory). The schedule should address both regular monitoring and reduced monitoring frequencies (if allowed by the state).
- C The plan should also distinguish between compliance samples and those taken for process control and/or information.
- C For conventional treatment plants for Subpart H systems, a summary of the system's enhanced coagulation/softening requirements.
- C A plan for calculating compliance with MCLs, MRDLs, and treatment techniques (unless compliance is calculated by the state based upon required monitoring reports).

Some states may wish to expand the subpart L monitoring requirements to include other monitoring requirements. A single monitoring plan, addressing all of a system's monitoring requirements, may be a useful tool for both the state and the PWS.

References for more detailed guidance

1. ICR Sampling Manual, USEPA, April 1996 (PB96-157508).
Available from:
NTIS
5285 Port Royal Rd
Springfield, VA 22161
Phone: 1-800-553-6847
2. ICR Water Utility Database System Users' Guide, USEPA, April 1996 (PB96-157219).
Available from:
NTIS
5285 Port Royal Rd
Springfield, VA 22161
Phone: 1-800-553-6847

⁴ In some cases states may wish to require modeling to establish locations of high residence time.

Section IV.

Other Resources and Guidance

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IV-A. Technical Information Available on the Stage 1 DBPR

A series of guidance manuals support the Stage 1 DBPR. The manuals will aid EPA, state agencies, and affected PWSs in implementing this rule and will help ensure that implementation among these groups is consistent. Summaries of the manuals and information on how to obtain them are provided below. The three technical guidance manuals associated with the Stage 1 DBPR are:

- T Alternative Disinfectants and Oxidants Guidance Manual
- T M-DBP Simultaneous Compliance Guidance Manual
- T Enhanced Coagulation and Enhanced Precipitative Softening Guidance Manual

Alternative Disinfectants and Oxidants Guidance Manual (EPA 815-R-99-014)

Objective: To provide technical data and engineering information on disinfectants and oxidants that are not as commonly used as chlorine so that systems can evaluate their options for developing disinfection schemes to control water quality problems such as zebra mussels and Asiatic clams, and oxidation to control water quality problems associated with iron and manganese.

Contents: The manual discusses six disinfectants and oxidants: ozone, chlorine dioxide, potassium permanganate, chloramines, ozone/hydrogen peroxide combinations, and ultraviolet light. A decision tree is provided to assist in evaluating which disinfectant, or disinfectants, is most appropriate given certain site-specific conditions (e.g., water quality conditions, existing treatment, and operator skill). The manual also contains a summary of existing alternative disinfectants used in the U.S. and cost estimates for the use of alternative disinfectants.

M-DBP Simultaneous Compliance Guidance Manual (EPA 815-R-99-015)

Objective: To assist PWSs on complying simultaneously with various drinking water regulations (e.g., Stage 1 DBPR, IESWTR, Lead and Copper Rule, and the Total Coliform Rule). The manual discusses operational problems systems may encounter when implementing these rule.

Contents: The manual provides detailed information on the requirements in the Stage 1 DBPR and the IESWTR.

Enhanced Coagulation and Enhanced Precipitative Softening Guidance Manual (EPA 815-R-99-012)

Objective: To assist utilities in implementing, monitoring, and complying with the treatment technique requirements in the final Stage 1 DBPR and to provide guidance to state staff responsible for implementing the treatment requirements.

Contents: The manual provides detailed information on the total organic carbon (TOC) removal requirement, explains how to set an alternative TOC removal percentage under the Step 2 procedure, details monitoring, reporting, and compliance requirements, and discusses strategies that can be employed to mitigate the potential secondary effects on plant performance due to implementation of the treatment technique.

Links to these manuals can be found at the website:

www.epa.gov/safewater/mdbp/implement.html.

They are also available free of charge (while supplies last) from:

- L The National Service for Environmental Publications (NSCEP, formerly NCEPI) at 1.800.490.9198

- L The Office of Water Resource Center at 1.202.260.7786.

IV-B. Rule Presentation

A presentation that can be used for workshops for the Stage 1 DBPR is available in Power Point format on the Drinking Water Academy web site.

<http://www.epa.gov/safewater/dwa/electronic/M-DBPmodule.html>

IV-C. Fact Sheets

The following pages are fact sheets on the rules. They may be useful in conveying information to water systems, new personnel, and for educating stakeholders about the rules. The fact sheets are included in this section are:

- T Drinking Water Priority Rulemaking: Microbial and Disinfection Byproduct Rules
- T Stage 1 Disinfectants and Disinfection Byproducts Rule
- T Stage 1 Disinfectants and Disinfection Byproducts Rule: Quick Reference Guide



Drinking Water Priority Rulemaking: Microbial and Disinfection Byproduct Rules

Disinfection of drinking water is one of the major public health advances in the 20th century. One hundred years ago, typhoid and cholera epidemics were common throughout American cities and disinfection was a major factor in reducing these epidemics. However, the disinfectants themselves can react with naturally-occurring materials in the water to form unintended byproducts which may pose health risks.

Over the past ten years, we have also learned that there are specific microbial pathogens, such as *Cryptosporidium*, that are highly resistant to traditional disinfection practices. In 1993, *Cryptosporidium* caused 400,000 people in Milwaukee to experience intestinal illness. More than 4,000 were hospitalized, and at least 50 deaths have been attributed to the disease. There have also been cryptosporidiosis outbreaks in Nevada, Oregon, and Georgia over the past several years.

A major challenge for water suppliers is how to balance the risks from microbial pathogens and disinfection byproducts. It is important to provide protection from these microbial pathogens while simultaneously ensuring decreasing health risks to the population from disinfection byproducts (DBPs). The Safe Drinking Water Act (SDWA) Amendments, signed by President Clinton in August 1996, required EPA to develop rules to achieve these goals.

These new rules are a product of six years of collaboration between the water industry, environmental and public health groups, and local, state and federal government. This fact sheet contains general information about the two new rules and others that are a part of the Microbial-Disinfectants and Disinfection Byproducts (M-DBP) Rules. Separate fact sheets focus on the Interim Enhanced Surface Water Treatment Rule (EPA 816-F-01-013) and the Stage 1 Disinfectants and Disinfection Byproducts Rule (EPA 816-F-01-014).

Schedule of M-DBP Rules

December 16, 1998 – Final Rule	Interim Enhanced Surface Water Treatment Rule and Stage 1 Disinfectants and Disinfection Byproducts Rule
June 8, 2001 – Final Rule	Filter Backwash Recycling Rule
Summer 2001 – Final Rule	Long Term 1 Enhanced Surface Water Treatment Rule
Spring/Summer 2002 – Final Rule	Ground Water Rule
May 2002 – Final Rule	Long Term 2 Enhanced Surface Water Treatment Rule and Stage 2 Disinfectants and Disinfection Byproducts Rule

PUBLIC HEALTH CONCERNS

Most Americans drink tap water that meets all existing health standards all the time. These new rules will further strengthen existing drinking water standards and thus increase protection for many water systems.

In 1990, EPA's Science Advisory Board concluded that exposure to microbial contaminants such as bacteria, viruses, and protozoa (e.g., *Giardia lamblia* and *Cryptosporidium*) was likely the greatest remaining health risk management challenge for drinking water suppliers. Acute health effects from exposure to microbial pathogens is documented and associated illness can range from mild to moderate cases lasting only a few days to more severe infections that can last several weeks and may result in death for those with weakened immune systems.

While disinfectants are effective in controlling many microorganisms, they react with natural organic and inorganic matter in source water and the distribution system to form potentially harmful DBPs. Many of these DBPs have been shown to cause cancer and reproductive and developmental effects in laboratory animals. More than 200 million people consume water that has been disinfected. Because of the large population exposed, health risks associated with DBPs, even if small, need to be taken seriously.

EXISTING REGULATIONS

- C Surface Water Treatment Rule – The Surface Water Treatment Rule, promulgated in 1989, applies to all public water systems using surface water sources or ground water sources under the direct influence of surface water. It establishes maximum contaminant level goals (MCLGs) for viruses, bacteria and *Giardia lamblia*. It also includes treatment technique requirements for filtered and unfiltered systems that are specifically designed to protect against the adverse health effects of exposure to these microbial pathogens.
- Total Coliform Rule – The Total Coliform Rule, revised in 1989, applies to all PWSs and establishes a maximum contaminant level (MCL) for total coliforms.
- C Total Trihalomethane Rule – In 1979, EPA set an interim MCL for total trihalomethanes of 0.10 mg/l as an annual average. This applies to any community water system serving at least 10,000 people that adds a disinfectant to the drinking water during any part of the treatment process.
- Information Collection Rule – The Information Collection Rule, promulgated in 1996, established monitoring and data reporting requirements for large public water systems serving at least 100,000 people to support the M-DBP rulemaking process. This rule was intended to provide EPA with information on the occurrence in drinking water of microbial pathogens and DBPs. In addition, EPA collected engineering data on how PWSs currently control such contaminants.

INTERIM ENHANCED SURFACE WATER TREATMENT RULE AND STAGE 1 DISINFECTANTS AND DISINFECTION BYPRODUCTS RULE

EPA published the Interim Enhanced Surface Water Treatment Rule and Stage 1 Disinfectants and Disinfection Byproducts Rule in December 1998. The final rules resulted from formal regulatory negotiations with a wide range of stakeholders that took place in 1992-93 and 1997.

Interim Enhanced Surface Water Treatment Rule

The Interim Enhanced Surface Water Treatment Rule applies to systems using surface water, or ground water under the direct influence of surface water, that serve 10,000 or more persons. The rule also includes provisions for states to conduct sanitary surveys for surface water systems regardless of system size. The rule builds upon the treatment technique requirements of the Surface Water Treatment Rule with the following key additions and modifications:

- Maximum contaminant level goal (MCLG) of zero for Cryptosporidium.
- 2-log Cryptosporidium removal requirements for systems that filter.
- Strengthened combined filter effluent turbidity performance standards.
- Individual filter turbidity monitoring provisions.
- Disinfection profiling and benchmarking provisions.
- Systems using ground water under the direct influence of surface water now subject to the new rules dealing with Cryptosporidium.
- Inclusion of Cryptosporidium in the watershed control requirements for unfiltered public water systems.
- Requirements for covers on new finished water storage facilities.
- Sanitary surveys, conducted by states, for all surface water systems regardless of size.

The Interim Enhanced Surface Water Treatment Rule, with tightened turbidity performance criteria and required individual filter monitoring, is designed to optimize treatment reliability and to enhance physical removal efficiencies to minimize the Cryptosporidium levels in finished water. In addition, the rule includes disinfection benchmark provisions to assure continued levels of microbial protection while facilities take the necessary steps to comply with new DBP standards.

Stage 1 Disinfectants and Disinfection Byproducts Rule

The final Stage 1 Disinfectants and Disinfection Byproducts Rule applies to community water systems and non-transient non-community systems and transient non-community water systems using chlorine dioxide MCLs, including those serving fewer than 10,000 people, that add a disinfectant to the drinking water during any part of the treatment process.

The final Stage 1 Disinfectants and Disinfection Byproducts Rule includes the following key provisions:

- Maximum residual disinfectant level goals (MRDLGs) for chlorine (4 mg/L), chloramines (4 mg/L), and chlorine dioxide (0.8 mg/L).
- Maximum contaminant level goals (MCLGs) for three trihalomethanes (bromodichloromethane (zero), dibromochloromethane (0.06 mg/L), and bromoform (zero)), two haloacetic acids (dichloroacetic acid (zero) and trichloroacetic acid (0.3 mg/L)), bromate (zero), and chlorite (0.8 mg/L).
- MRDLs for three disinfectants (chlorine (4.0 mg/L), chloramines (4.0 mg/L), and chlorine dioxide (0.8 mg/L)).
- MCLs for total trihalomethanes (0.080 mg/L) - a sum of the three listed above plus chloroform, haloacetic acids (HAA5) (0.060 mg/L)- a sum of the two listed above plus monochloroacetic acid and

mono- and dibromoacetic acids), and two inorganic disinfection byproducts (chlorite (1.0 mg/L)) and bromate (0.010 mg/L).

- A treatment technique for removal of DBP precursor material.

The terms MRDLG and MRDL, which are not included in the SDWA, were created during the negotiations to distinguish disinfectants (because of their beneficial use) from contaminants. The final rule includes monitoring, reporting, and public notification requirements for these compounds. This final rule also describes the best available technology (BAT) upon which the MRDLs and MCLs are based.

FUTURE RULES

Long Term 1 Enhanced Surface Water Treatment Rule

While the Stage 1 Disinfectants and Disinfection Byproducts Rule will apply to systems of all sizes, the Interim Enhanced Surface Water Treatment Rule only applies to systems serving 10,000 or more people. The Long Term 1 Enhanced Surface Water Treatment Rule, expected in 2001, will strengthen microbial controls for small systems (i.e. those systems serving fewer than 10,000 people). The rule will also prevent significant increase in microbial risk where small systems take steps to implement the Stage 1 Disinfectants and Disinfection Byproducts Rule.

EPA believes that the rule will generally track the approaches in the Interim Enhanced Surface Water Treatment Rule for improved turbidity control, including individual filter monitoring and reporting. The rule will also address disinfection profiling and benchmarking.

Long Term 2 Enhanced Surface Water Treatment Rule and Stage 2 Disinfectants and Disinfection Byproduct Rule

The SDWA, as amended in 1996, requires EPA to finalize a Stage 2 Disinfectants and Disinfection Byproducts Rule by May 2002. Although the 1996 Amendments do not require EPA to finalize a Long Term 2 Enhanced Surface Water Treatment Rule along with the Stage 2 Disinfectants and Disinfection Byproducts Rule, EPA believes it is important to finalize these rules together to ensure a proper balance between microbial and DBP risks.

EPA began discussions with stakeholders in December 1998 on the direction for these rules. EPA anticipates proposed rules in 2001. The intent of the rules is to provide additional public health protection, if needed, from DBPs and microbial pathogens.

Ground Water Rule

EPA is finalizing the Ground Water Rule which specifies the appropriate use of disinfection and, just as importantly, addresses other components of ground water systems to ensure public health protection. There are more than 158,000 public ground water systems. Almost 89 million people are served by community ground water systems, and 20 million people are served by non-community ground water systems. Ninety-nine percent (157,000) of ground water systems serve fewer than 10,000 people. However, systems serving more than 10,000 people serve 55 percent (more than 60 million) of all people who get their drinking water from public ground water systems.

Filter Backwash Recycling Rule

The Filter Backwash Recycling Rule establishes a standard to return all recycle flows to a point that incorporates all treatment processes of the system's existing conventional or direct filtration systems or at an alternate location approved by the state. The regulation will apply to public water systems that use surface water or ground water under the direct influence of surface water, practice conventional or direct filtration,

and recycle spent filter backwash, sludge thickener supernatant, or liquids from dewatering processes. The rule was promulgated on June 8, 2001.

ADDITIONAL INFORMATION

EPA encourages public input into regulation development. Public meetings and opportunities for public comment on M-DBP rules are announced in the *Federal Register*. EPA's Office of Ground Water and Drinking Water also provides this information for the M-DBP rules and other programs in its online Calendar of Events.

For more information, contact EPA's Safe Drinking Water Hotline, 1-800- 426-4791, or see the Office of Ground Water and Drinking Water web page at <http://www.epa.gov/safewater/standards.html>.

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Stage 1 Disinfectants and Disinfection Byproducts Rule

In the past 25 years, the Safe Drinking Water Act (SDWA) has been highly effective in protecting public health and has also evolved to respond to new and emerging threats to safe drinking water. Disinfection of drinking water is one of the major public health advances in the 20th century. One hundred years ago, typhoid and cholera epidemics were common through American cities; disinfection was a major factor in reducing these epidemics.

However, the disinfectants themselves can react with naturally-occurring materials in the water to form unintended byproducts which may pose health risks. In addition, in the past 10 years, we have learned that there are specific microbial pathogens, such as *Cryptosporidium*, which can cause illness, and is highly resistant to traditional disinfection practices.

Amendments to the SDWA in 1996 require EPA to develop rules to balance the risks between microbial pathogens and disinfection byproducts (DBPs). It is important to strengthen protection against microbial contaminants, especially *Cryptosporidium*, and at the same time, reduce potential health risks of DBPs. The Stage 1 Disinfectants and Disinfection Byproducts Rule and Interim Enhanced Surface Water Treatment Rule, announced in December 1998, are among the first of a set of rules under the 1996 SDWA Amendments. This fact sheet focuses on the Stage 1 Disinfectants and Disinfection Byproducts Rule. A separate fact sheet focuses on the Interim Enhanced Surface Water Treatment Rule (EPA 816-F-01-013).

PUBLIC HEALTH CONCERNS

While disinfectants are effective in controlling many microorganisms, they react with natural organic and inorganic matter in source water and distribution systems to form DBPs. Results from toxicology studies have shown several DBPs (e.g., bromodichloromethane, bromoform, chloroform, dichloroacetic acid, and bromate) to be carcinogenic in laboratory animals. Other DBPs (e.g., chlorite, bromodichloromethane, and certain haloacetic acids) have also been shown to cause adverse reproductive or developmental effects in laboratory animals. Several epidemiology studies have suggested a weak association between certain cancers (e.g., bladder) or reproductive and developmental effects, and exposure to chlorinated surface water. More than 200 million people consume water that has been disinfected. Because of the large population exposed, health risks associated with DBPs, even if small, need to be taken seriously.

WHO MUST COMPLY WITH THE RULE?

The Stage 1 Disinfectants and Disinfection Byproducts Rule applies to all community and nontransient noncommunity water systems that add a chemical disinfectant in any part of the drinking water treatment process and transient NCWSs using chlorine dioxide.

WHAT DOES THE RULE REQUIRE?

The Stage 1 Disinfectants and Disinfection Byproduct Rule updates and supersedes the 1979 regulations for total trihalomethanes. In addition, it will reduce exposure to three disinfectants and many disinfection byproducts.

The rule establishes maximum residual disinfectant level goals (MRDLGs) and maximum residual disinfectant levels (MRDLs) for three chemical disinfectants—chlorine, chloramine and chlorine dioxide (see Table 1). It also establishes maximum contaminant level goals (MCLGs) and maximum contaminant levels (MCLs) for total trihalomethanes, haloacetic acids, chlorite and bromate (see Table 1).

Table 1
MRDLGs, MRDLs, MCLGs and MCLs for Stage 1 Disinfectants
and Disinfection Byproducts Rule

Disinfectant Residual	MRDLG (mg/L)	MRDL (mg/L)	Compliance Based On
Chlorine	4 (as Cl ₂)	4.0 (as Cl ₂)	Annual Average
Chloramine	4 (as Cl ₂)	4.0 (as Cl ₂)	Annual Average
Chlorine Dioxide	0.8 (as ClO ₂)	0.8 (as ClO ₂)	Daily Samples
Disinfection Byproducts	MCLG (mg/L)	MCL (mg/L)	Compliance Based On
Total trihalomethanes (TTHM) ¹	N/A	0.080	Annual Average
- Chloroform	N/A		
- Bromodichloromethane	zero		
- Dibromochloromethane	0.06		
- Bromoform	zero		
Haloacetic acids (five) (HAA5) ²	N/A	0.060	Annual Average
- Dichloroacetic acid	zero		
- Trichloroacetic acid	0.3		
Chlorite	0.8	1.0	Monthly Average
Bromate	zero	0.010	Annual Average

N/A Not applicable because there are individual MCLGs for TTHMs or HAAs.

1 Total trihalomethanes is the sum of the concentrations of chloroform, bromodichloromethane, dibromochloromethane, and bromoform.

2 Haloacetic acids (five) is the sum of the concentrations of mono-, di-, and trichloroacetic acids and mono- and dibromoacetic acids.

Water systems that use surface water or ground water under the direct influence of surface water and use conventional filtration treatment are required to remove specified percentages of organic materials, measured as total organic carbon (TOC), that may react with disinfectants to form DBPs (See Table 2). Removal will be achieved through a treatment technique (enhanced coagulation or enhanced softening) unless a system meets alternative criteria.

**Table 2
Required Removal of Total Organic Carbon by Enhanced Coagulation and Enhanced Softening for
Subpart H Systems Using Conventional Treatment¹**

Source Water TOC (mg/L)	Source Water Alkalinity (mg/L as CaCO ₃)		
	0-60	>60-120	>120 ²
>2.0-4.0	35.0%	25.0%	15.0%
>4.0-8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

1-Systems meeting at least one of the alternative compliance criteria in the rule are not required to meet the removals in this table.

2-Systems practicing softening must meet the TOC removal requirements in the last column to the right.

WHAT ARE THE COMPLIANCE DEADLINES?

Surface water systems and systems using ground water under the direct influence of surface water serving 10,000 or more people are required to comply with the Stage 1 Disinfectants and Disinfection Byproducts Rule by January 1, 2002. All ground water systems and systems using surface water or ground water under the direct influence of surface water serving less than 10,000 people must comply with the Stage 1 Disinfectants and Disinfection Byproducts Rule by January 1, 2004.

WHAT ARE THE COSTS AND BENEFITS OF THE RULE?

EPA estimates that implementation of the Stage 1 Disinfectants and Disinfection Byproducts Rule will result in:

- 1- As many as 140 million people receiving increased protection from DBPs.
- 2- 24 percent national average reduction in TTHM levels.
- 3- Reduction in exposure to the major DBPs from use of ozone (bromate) and chlorine dioxide (chlorite).

The total annual cost of the rule is about \$700 million. EPA believes that the benefits exceed the costs of the Stage 1 Disinfectants and Disinfection Byproducts Rule. An estimated 115 million households are affected by the Stage 1 Disinfectants and Disinfection Byproducts Rule. EPA estimates that 95 percent of the households will incur additional costs of less than \$1 per month on their water bills. An additional four percent will pay between \$1 and \$10 per month more, and one percent are expected to incur increased water bills of \$10 to \$33 per month, if they choose to install treatment. However, many of these systems may chose less costly non-treatment options, such as consolidation. The majority of households incurring the highest costs are small systems serving less than 10,000 people that have never been regulated for DBPs.

WHAT TECHNICAL INFORMATION WILL BE AVAILABLE ON THE RULE?

A series of guidance manuals have been developed to support the Stage 1 Disinfectants and Disinfection Byproducts Rule. The manuals will aid EPA, state agencies and affected public water systems in implementing the Stage 1 DBPR. The guidance manual are available on EPA's website at www.epa.gov/safewater/mdbp/implement.html.

Guidance Manual for Enhanced Coagulation and Enhanced Precipitative Softening

Objective: To assist utilities in implementing, monitoring, and complying with the treatment technique requirements in the final Stage 1 Disinfectants and Disinfection Byproducts Rule and to provide guidance to state staff responsible for implementing the treatment requirements.

Contents: The manual provides detailed information on the total organic carbon (TOC) removal requirement; explains how to set an alternative TOC removal percentage under the Step 2 procedure; details monitoring, reporting, and compliance requirements; and discusses strategies that can be employed to mitigate the potential secondary effects on plant performance due to implementation of the treatment technique.

Alternative Disinfectants and Oxidants Guidance Manual

Objective: To provide technical data and engineering information on disinfectants and oxidants that are not as commonly used as chlorine, so that systems can evaluate their options for developing disinfection schemes to control water quality problems such as zebra mussels and Asiatic clams, and oxidation to control water quality problems associated with iron and manganese.

Contents: The manual discusses six disinfectants and oxidants: ozone, chlorine dioxide, potassium permanganate, chloramines, ozone/hydrogen peroxide combinations, and ultraviolet light. A decision tree is provided to assist in evaluating which disinfectant(s) is most appropriate given certain site-specific conditions (e.g., water quality conditions, existing treatment and operator skill). The manual also contains a summary of existing alternative disinfectants use in the United States and cost estimates for the use of alternative disinfectants.

M/DBP Simultaneous Compliance Manual

Objective: To assist public water systems on complying simultaneously with various drinking water regulations (e.g., Stage 1 Disinfectants and Disinfection Byproducts Rule, Interim Enhanced Surface Water Treatment Rule, Lead and Copper Rule and the Total Coliform Rule). The manual discusses operational problems systems may encounter when implementing these rules.

Contents: The manual provides detailed information on the requirements in the Stage 1 Disinfectants and Disinfection Byproducts Rule and the Interim Enhanced Surface Water Treatment Rule and issues involved with simultaneously complying with other rules.

For more information, contact EPA's Safe Drinking Water Hotline, 1.800.426.4791, or see the Office of Ground Water and Drinking Water web page at <http://www.epa.gov/safewater/standards.html>.



Stage 1 Disinfectants and Disinfection Byproducts Rule: A Quick Reference Guide



Overview of the Rule

Title	Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) 63 FR 69390 - 69476, December 16, 1998, Vol. 63, No. 241 Revisions to the Interim Enhanced Surface Water Treatment Rule (IESWTR), the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR), and Revisions to State Primacy Requirements to Implement the Safe Drinking Water Act (SDWA) Amendments 66 FR 3770, January 16, 2001, Vol 66, No. 29
Purpose	Improve public health protection by reducing exposure to disinfection byproducts. Some disinfectants and disinfection byproducts (DBPs) have been shown to cause cancer and reproductive effects in lab animals and suggested bladder cancer and reproductive effects in humans.
General Description	The Stage 1 DBPR is the first of a staged set of rules that will reduce the allowable levels of DBPs in drinking water. The new rule establishes seven new standards and a treatment technique of enhanced coagulation or enhanced softening to further reduce DBP exposure. The rule is designed to limit capital investments and avoid major shifts in disinfection technologies until additional information is available on the occurrence and health effects of DBPs.
Utilities Covered	The Stage 1 DBPR applies to all sizes of community water systems and nontransient noncommunity water systems that add a disinfectant to the drinking water during any part of the treatment process and transient noncommunity water systems that use chlorine dioxide.

Public Health Benefits

Implementation of the Stage 1 DBPR will result in . . .	<ul style="list-style-type: none"> ▶ As many as 140 million people receiving increased protection from DBPs. ▶ 24 percent average reduction nationally in trihalomethane levels. ▶ Reduction in exposure to the major DBPs from use of ozone (DBP = bromate) and chlorine dioxide (DBP = chlorite).
Estimated impacts of the Stage 1 DBPR include . . .	<ul style="list-style-type: none"> ▶ National capital costs: \$2.3 billion ▶ National total annualized costs to utilities: \$684 million ▶ 95 percent of households will incur an increase of less than \$1 per month. ▶ 4 percent of households will incur an increase of \$1-10 per month. ▶ <1 percent of households will incur an increase of \$10-33 per month.

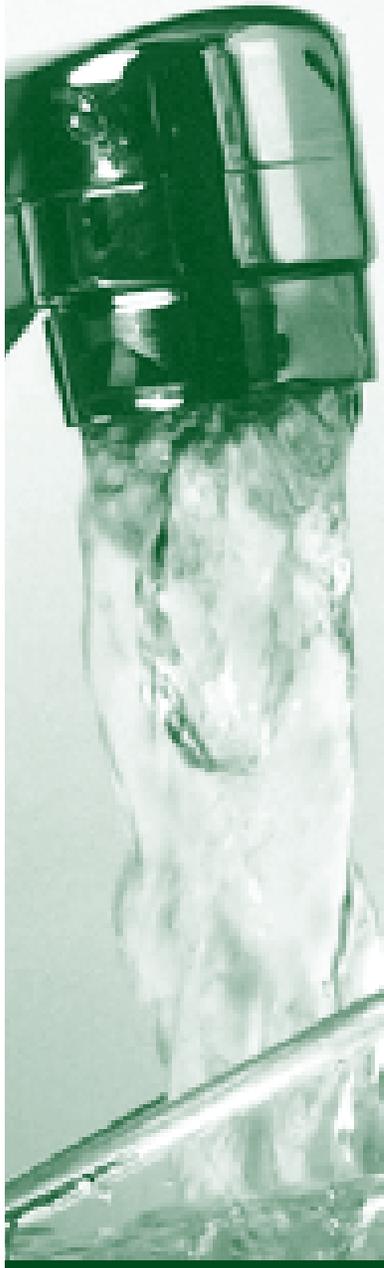
Critical Deadlines and Requirements

For Drinking Water Systems

January 1, 2002	Surface water systems and ground water systems under the direct influence of surface water serving [≥] 10,000 people must comply with the Stage 1 DBPR requirements.
January 1, 2004	Surface water systems and ground water systems under the direct influence of surface water serving < 10,000, and all ground water systems must comply with the Stage 1 DBPR requirements.

For States

December 16, 2000	States submit Stage 1 DBPR primacy revision applications to EPA (triggers interim primacy).
December 16, 2002	Primacy extension deadline - all states with an extension must submit primacy revision applications to EPA.



Regulated Contaminants/Disinfectants					
Regulated Contaminants	MCL (mg/L)	MCLG (mg/L)	Regulated Disinfectants	MRDL* (mg/L)	MRDLG* (mg/L)
Total Trihalomethanes (TTHM)	0.080				
Chloroform Bromodichloromethane Dibromochloromethane Bromoform		- zero 0.06 zero	Chlorine	4.0 as Cl ₂	4
Five Haloacetic Acids (HAA5)	0.060		Chloramines	4.0 as Cl ₂	4
Monochloroacetic acid Dichloroacetic acid Trichloroacetic acid Bromoacetic acid Dibromoacetic acid		- zero 0.3 - -	Chlorine dioxide	0.8	0.8
Bromate (plants that use ozone)	0.010	zero	*Stage 1 DBPR includes maximum residual disinfectant levels (MRDLs) and maximum residual disinfectant level goals (MRDLGs) which are similar to MCLs and MCLGs, but for disinfectants.		
Chlorite (plants that use chlorine dioxide)	1.0	0.8			
Treatment Technique					
Enhanced coagulation/enhanced softening to improve removal of DBP precursors (See Step 1 TOC Table) for systems using conventional filtration treatment.					

Step 1 TOC Table - Required % Removal of TOC			
Source Water TOC (mg/L)	Source Water Alkalinity, mg/L as CaCO ₃		
	0-60	> 60-120	> 120
> 2.0 to 4.0	35.0%	25.0%	15.0%
> 4.0 to 8.0	45.0%	35.0%	25.0%
> 8.0	50.0%	40.0%	30.0%

¹ Systems meeting at least one of the alternative compliance criteria in the rule are not required to meet the removals in this table.
² Systems practicing softening must meet the TOC removal requirements in the last column to the right

Routine Monitoring Requirements			
	Coverage	Monitoring Frequency	Compliance
TTHM/HAA5	Surface and ground water under the direct influence of surface water serving [≅] 10,000	4/plant/quarter	Running annual average
	Surface and ground water under the direct influence of surface water serving 500 - 9,999	1/plant/quarter	Running annual average
	Surface and ground water under the direct influence of surface water serving < 500	1/plant/year in month of warmest water temperature**	Running annual average of increased monitoring
	Ground water serving [≅] 10,000	1/plant/quarter	Running annual average
	Ground water serving < 10,000	1/plant/year in month of warmest water temperature**	Running annual average of increased monitoring
Bromate	Ozone plants	Monthly	Running annual average
Chlorite	Chlorine dioxide plants	Daily at entrance to distribution system; monthly in distribution system	Daily/follow-up monitoring
Chlorine dioxide	Chlorine dioxide plants	Daily at entrance to distribution system	Daily/follow-up monitoring
Chlorine/Chloramines	All systems	Same location and frequency as TCR sampling	Running annual average
DBP precursors	Conventional filtration	Monthly for total organic carbon and alkalinity	Running annual average

** System must increase monitoring to 1 sample per plant per quarter if an MCL is exceeded.

For additional information on the Stage 1 DBPR

Call the Safe Drinking Water Hotline at 1-800-426-4791; visit the EPA web site at www.epa.gov/safewater; or contact your State drinking water representative.

Additional material is available at www.epa.gov/safewater/mdbp/implement.html.

IV-D. Frequently Asked Questions

TABLE OF CONTENTS

1.0	Stage 1 Disinfectants/Disinfection Byproducts Rule	19
1.1	Disinfectants	19
1.1.1	Chlorine and Chloramines	19
1.1.2	Chlorine Dioxide	20
1.2	Disinfection Byproducts	21
1.2.1	TTHM and HAA5	21
1.2.2	Bromate	26
1.2.3	Chlorite	27
1.3	Disinfection Byproduct Precursors	28
1.4	Monitoring	33
1.4.1	General Monitoring Issues	33
1.4.2	Monitoring Plans	34
1.4.3	Multiple Wells Drawing from a Single Aquifer	35
1.4.4	Reporting and Recordkeeping	35
1.4.5	Consecutive Systems	36
2.0	General Program Requirements	36
2.1	Primacy	36
2.2	Violations, SDWIS Reporting and SNC Definitions	37
2.3	Qualified Operators	37

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1.0 Stage 1 Disinfectants/Disinfection Byproducts Rule

1.1 Disinfectants

1.1.1 Chlorine and Chloramines

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(76), (77)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.54	Maximum Residual Disinfectant Level Goals
§141.65	Maximum Residual Disinfectant Levels
§141.131(c)(1), (2), (3)	Analytical Requirements
§141.132(c)(1)(i), (ii), (iii)	Monitoring Requirements
§141.133(c)(1)(i), (ii)	Compliance Requirements
§141.134(c)	Reporting and Recordkeeping Requirements

Q: *Under the Surface Water Treatment Rule water systems can measure heterotrophic plate counts (HPC) in lieu of chlorine residuals. If the results of the HPC are acceptable (< 500 cfu/ml) they are determined to be in compliance with the requirement for a detectable residual in the distribution system. Will these systems now be required to measure a chlorine residual to ensure they do not exceed the MRDL?*

A: Yes. The Stage 1 DBPR requires that disinfection residuals be measured to ensure the MRDL is not exceeded. Therefore, HPC measurements cannot be performed in lieu of this testing. However, where detectable residuals are not found, HPCs may be conducted for SWTR compliance.

Q: *Our state requires daily chlorine residual measurements to be taken throughout the distribution system. What samples should be considered when calculating compliance with the MRDL?*

A: For the Stage 1 DBPR's MRDL, compliance is based upon the samples collected under §141.132(c)(1). The samples are collected at the same time and place as coliform samples as specified in §141.21. Subpart H systems may use samples collected under the requirements of the SWTR (§141.74(c)(3)(i)) in lieu of taking separate samples. The system's monitoring plan will indicate which samples are to be used for compliance determinations.

Q: *Can systems use additional chlorine sampling sites (if states have approved additional sites beyond the TCR)?*

A: Yes, if these are included in the monitoring plan.

Q: *Does the Stage 1 DBPR apply to chlorine added to the treatment process as an oxidant?*

A: Yes. The requirements are applicable to chlorine added anywhere in the treatment process due to the potential formation of TTHM and HAA5.

- Q:** For a system to comply with the MRDLs for chlorine and chloramine, what residual disinfectant concentration should be measured?
- A:** For a system that uses free chlorine for residual maintenance, either free or total chlorine measurement is acceptable. For a system that uses chloramines for residual maintenance, the measure must be combined or total chlorine.

1.1.2 Chlorine Dioxide

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(78)(i), (ii)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.54	Maximum Residual Disinfectant Level Goals
§141.65	Maximum Residual Disinfectant Levels
§141.131(c)(1), (2), (3)	Analytical Requirements
§141.132(c)(2)(i), (ii), (iii)	Monitoring Requirements
§141.133(c)(2)(i), (ii)	Compliance Requirements
§141.134(c)	Reporting and Recordkeeping Requirements

Q: Does daily monitoring for chlorine dioxide mean 7 days a week? Some systems are not staffed on the weekend. Do systems that add chlorine dioxide need to have someone in on the weekend in order to stay in compliance?

A: Yes, systems will have to conduct this monitoring daily. Systems have 3 or 5 years, depending on source water type and size, to get the plant staffed for conducting the required monitoring or change the disinfectant. This monitoring is required and must be conducted daily due to the acute health risks associated with chlorine dioxide.

Q: What systems are required to monitor for chlorine dioxide and chlorite?

A: All nontransient noncommunity and community systems that use chlorine dioxide, regardless of the purpose, (e.g., disinfection, oxidation, or maintenance of a residual) must monitor for both chlorine dioxide and for the disinfection byproduct, chlorite. Transient noncommunity systems that use chlorine dioxide must monitor for chlorine dioxide, but not for chlorite. There is no provision under the rule for reduced chlorine dioxide monitoring even if the chlorine dioxide is not used for primary disinfection. If the system is using chlorine dioxide intermittently, the system is not required to conduct the daily monitoring for chlorine dioxide and chlorite for days when the chlorine dioxide is not in use or monthly monitoring for chlorite if the chlorine dioxide has not been used at all for the entire month. Monthly monitoring for chlorite is required if chlorine dioxide is used at any time during the month.

- Q:** *If my system is triggered into repeat ClO₂ sampling and I have booster chlorination, the rule says one of the repeat samples must be “as close to the first customer as possible.” Does this mean the first customer in the entire distribution system, or the first customer after booster chlorination?*
- A:** The term “first customer” refers to the first customer in the distribution system. However, the sample that is taken at the longest residence time for compliance with ClO₂ monitoring requirements at §141.132(c)(2)(ii) should be downstream of the point of booster chlorination.

1.2 Disinfection Byproducts

1.2.1 TTHM and HAA5

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(79)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.53	Maximum Contaminant Level Goals
§141.64	Maximum Contaminant Levels
§141.131(b)(1), (2)	Analytical Requirements
§141.132(b)(1)(i), (ii), (iii), (iv)	Monitoring Requirements
§141.133(b)(1)(i), (ii), (iii)	Compliance Requirements
§141.134(b)	Reporting and Recordkeeping Requirements

- Q:** *If a system rechlorinates in the distribution system, are these rechlorination stations considered “separate plants” under the Stage 1 D/DBPR?*
- A:** No, these rechlorination stations are not generally considered separate plants for minimum monitoring determinations. However, they should be taken into consideration when developing monitoring plans so that maximum residence time/maximum DBP formation is seen, and depending upon the specifics of the system the state may wish to consider these stations as “separate plants”.
- Q:** *The TTHM Rule requires systems to take all required samples within a 24-hour period. The Stage 1 Rule, however, does not specify a time-frame when all the samples need to be collected. When should systems take their required TTHM/HAA5 samples?*
- A:** EPA believes that most systems will find it advantageous to take all their samples in one day but this is not required by the Stage 1 DBPR. However, states may require systems to collect all their TTHM/HAA5 samples within a specified period of time. In either case, systems must specify when their TTHM/HAA5 samples will be taken in their monitoring plan.

- Q:** *With respect to the new compliance requirements for TTHM testing that take effect in 2002 (or 2004 for small systems), when the new TTHM MCL comes into effect, will compliance be calculated based on the samples collected in the 2001 (or 2003) calendar year? Or, are they calculated based on the samples collected during the 2002 (or 2004) calendar year? At what point does the waterworks go out of compliance between the annual average of 0.100 mg/L and 0.080 mg/L?*
- A:** Compliance with the new MCL is based on samples taken beginning in the first quarter of 2002/2004. During the first year of compliance calculation if the sum of fewer than four quarters of data exceeds 0.320mg/L for TTHM or 0.240mg/L for HAA5, the system is immediately in violation (since they will exceed the MCL even if the remaining quarters are zero).
- Q:** *Can you be on routine monitoring for TTHMs and reduced monitoring for HAA5, or vice versa?*
- A:** No, a system cannot qualify for reduced monitoring for one contaminant and not for the other.
- Q:** *Will systems currently on reduced TTHM monitoring for the 1979 TTHM Rule be able to remain on reduced monitoring under the Stage 1 DBPR?*
- A:** Unless these systems conducted TTHM/HAA5 monitoring under the ICR, and have qualified with those samples, they will have to revert to routine monitoring under the Stage 1 DBPR until they re-qualify for reduced monitoring. Systems must have an annual average less than or equal to 0.040 mg/L and 0.030 mg/L for TTHM and HAA5 respectively before they can qualify for reduced monitoring.
- Q:** *To qualify for reduced TTHM and HAA5 monitoring, a Subpart H system must have one year of source water TOC data. To remain on reduced monitoring does the system need to have TOC data (i.e., is this a one time average or a rolling average)?*
- A:** To qualify for reduced TTHM and HAA5 monitoring, a Subpart H system must have one year of source water TOC data with an annual average no more than 4.0 mg/L prior to treatment. To remain on reduced monitoring the Subpart H system's annual average TOC level, before any treatment, must be less than or equal to 4.0 mg/L TOC. This is based on a rolling annual average and is not a one-time test. If a plant does not use conventional treatment, it is not required to monitor monthly for TOC for the enhanced coagulation requirement. However, if it wants to qualify for, and remain on, reduced monitoring for TTHM and HAA5, it must monitor monthly for TOC before any treatment.
- Q:** *Will states and systems need to adjust their monitoring and compliance activities based on the quarters created by the publication date of the rules on December 16? (i.e., will states and systems be allowed to start the new quarter on January 1 rather than December 16?)*
- A:** This issue was addressed with a technical correction to the rule published in the *Federal Register* on January 16, 2001. Monitoring and compliance activities will take effect beginning on January 1 following the December 16 compliance dates in the rule as published on December 16, 1998.

- Q:** *Please clarify compliance dates for monitoring under this rule. The rule states that the systems must comply with the rule requirements beginning January 1, 2002, or 2004 depending on the system size and source. What is the definition of beginning? Does this mean that systems must conduct their monitoring for TTHM and HAA5 a year in advance to determine compliance on December 16, 2001 (or 2003)? Or, do they start the monitoring in the first quarter of 2002 (or 2004) to determine compliance after the fourth quarter of 2002 (or 2004)?*
- A:** Monitoring begins in first quarter 2002/2004, with compliance determined after the fourth quarter, if quarterly samples are required. If the TTHM and HAA5 results are less than or equal to 0.080 mg/L or 0.060 mg/L respectively, the PWS is in compliance. If the results are greater than 0.080 mg/L or 0.060 mg/L for systems monitoring annually (or less frequently), the system goes to increased (quarterly) monitoring.
- Q:** *Can states phase out the TTHM rule faster than the DBPR allows?*
- A:** Yes, but only if states adopt and implement the Stage 1 DBPR ahead of schedule.
- Q:** *Can samples be taken for operational purposes and not be used for compliance?*
- A:** Yes. Systems are encouraged to take operational samples as necessary. Operational samples do not have to be used for compliance; however all samples used for compliance purposes must be noted in the system's monitoring plan.
- Q:** *Under the Stage 1 DBPR, if a system must increase its chlorine or chloramine levels to address an emergency (e.g. a main break or other contamination event), and is scheduled to collect DBP samples, should the system reschedule its TTHM/HAA5 sampling?*
- A:** The system is required to monitor during normal operating conditions, this includes changes in disinfection levels caused by water quality fluctuations. However, if the system is experiencing an emergency, and must increase its chlorine or chloramine levels during the period that monitoring is required under the sampling schedule, the system must consult with the state to determine if sampling may be delayed until the emergency has ended, and normal operation is resumed.
- Q:** *How can systems with more than one treatment plant determine compliance if each plant provides a different percentage of the system's supply? Averaging of all of the samples taken from a surface water source providing 90% of the systems water and a ground water plant serving the other 10% may not truly reflect the level of TTHMs and HAA5 in the entire system.*
- A:** EPA believes that for systems with more than one treatment plant, the quarterly average, representative of each treatment plant, should be determined separately. The quarterly average for the entire system should be calculated by weighing the averages for each of the treatment plants (total number of treatment plants = n) as follows:

(Quarterly average for samples representing treatment plant 1)

X (fraction of flow*into system from plant 1)

+ (Quarterly average for samples representing treatment plant 2)

X (fraction of flow* into system from plant 2)

+ ... (Quarterly average for samples representing treatment plant n)

X (fraction of flow* into system from plant n)

= quarterly average for the system

* for the purposes of this determination only, flow is defined as the average daily flow for the subject treatment plant during the subject compliance period.

(Note: this formula is taken directly page 13 of EPA's 1983 Guidance titled: Trihalomethanes in Drinking Water - Sampling, Analysis, Monitoring, and Compliance).

For added explanation, we offer the following based on the above formula:

Plant 1 serves 90% of the water to the system and has a quarterly average of 120 ppb for TTHM and plant 2 serves the other 10% and has a quarterly average of 40 ppb for TTHM or $(120 \times 0.9) + (40 \times 0.1) = 112$ ppb as a quarterly average for the system.

Q: *Assume a system has multiple wells and a single surface water source. Are the TTHM and HAA5 monitoring requirements for each plant, ground water and surface water, based upon the requirements for Subpart H systems?*

A: Yes. A system that uses ground water as well as surface water or ground water under the influence of surface water as part of their source is considered a Subpart H system. The monitoring requirements for all plants are as established in the rule for Subpart H systems. See also Section IV-G: Determining Monitoring Frequency for TTHM and HAA5 Sampling, Mixed Sources (Surface Water and Ground Water), Example SG3.

Q: *If a Subpart H system serving greater than or equal to 10,000 persons has two treatment plants and the distribution system is configured in such a way that one of the samples (e.g., max residence time) is in effectively the same location for both plants can the system use one sample to cover both treatment plants or does the system have to take two samples? In the most simple example, can the system take 7 samples instead of 8 with one sample counting for two?*

A: If a system can demonstrate in its monitoring plan to the satisfaction of the state that a sample taken within the distribution system effectively covers the monitoring requirements for two plants, it could count one sample as meeting the intent of the regulation. States should be reviewing the sampling plan to determine if by not taking a sample the system will still have data reflective of the spacial and temporal conditions in the distribution system for byproduct formation. However, this would not be considered appropriate for systems which are only required to take samples at one location per plant.

Q: *If a system uses surface water to supplement its ground water source on a seasonal basis what kind of system is it, Subpart H or ground water? What is the routine monitoring frequency for TTHM and HAA5 and how does the system qualify for reduced monitoring?*

A: The system would monitor according to the subpart H requirements during any quarter when using either surface water or ground water under the influence of surface water, the sample shall be taken so the results are representative of the surface source. When only using ground water, the system would monitor according to the requirements for a ground water system. (See the table under §141.132) The compliance calculations are based on a running annual average computed quarterly. If the running annual average computed quarterly for TTHM and HAA5 is less than or equal to 0.040 mg/L and 0.030 mg/L, respectively, and meets the TOC levels required for the months that the system uses surface water, the system qualifies for reduced monitoring.

See also Section IV-G: Determining Monitoring Frequency for TTHM and HAA5 Sampling, Mixed Sources (Surface Water and Ground Water), Example SG4.

Q: *How does a system determine its month of warmest water temperature for the purposes of monitoring for TTHM and HAA5 on a yearly or less frequent basis under the Stage 1 DBPR?*

A: Systems should monitor the temperature of their treated water or use historical data to ensure they are collecting samples during the month of warmest water temperatures (i.e. when disinfection byproduct formation is accelerated). For most systems this is likely to occur in July, August, or September. If the system operates during these months, this would likely be the time to take the TTHM and HAA5 samples. Systems that do not operate during these months must take their samples during the warmest month in which they operate. This requirement is designed to allow less frequent monitoring by collecting samples during worst case conditions.

Q: *Why are the levels of TTHM and HAA5 established at lower concentrations to qualify for reduced monitoring than to stay on reduced monitoring once qualified?*

A: Routine monitoring for TTHMs and HAA5 gives an indication of “average” disinfection byproduct occurrence in the distribution system. On the other hand, sampling requirements for reduced monitoring are designed to ensure that the sample measures “worst case” conditions for occurrence of the disinfection byproducts. Thus, these worst case samples are expected to contain higher concentrations of DBPs than the average of routine samples.

Q: *If a system is conducting routine yearly monitoring for TTHM/HAA5 and exceeds the MCL for either DBP in this yearly sample, is the system in violation under the Stage 1 DBPR?*

A: The system is not immediately in violation. The system must increase their monitoring to quarterly the very next quarter. If after a year of quarterly monitoring the system exceeds the MCL as an annual average, the system is in violation. If the system fails to perform all of the quarterly monitoring, compliance will be determined based on the available data and the system will also have a monitoring violation.

Q: *If the system uses an ICR approved lab to do the testing for TTHM and HAA5 in the first year, can it use the data collected to qualify for reduced TTHM and HAA5 monitoring?*

A: If the state approves the lab, then the system can use the data to qualify for reduced TTHM and HAA5 monitoring provided that the data meets all the other D/DBPR compliance sampling and analysis requirements. In addition, Subpart H systems must meet

applicable TOC levels. Systems which collected TTHM and HAA5 data for applicability monitoring under the IESWTR (see Q and A in section 2.2) can use that data if the samples were analyzed by a certified laboratory using approved ICR methods.

Q: *Do TTHM and HAA5 samples have to be collected at the same time and location?*

A: Yes, they should. However, there is no regulatory requirement to sample at the same time and location. The system has to specify locations and schedules for collecting samples in its monitoring plan.

Q: *Does the use of any oxidant mean that my system is required to sample for TTHMs?*

A: A system that uses an oxidant that can also be used as a disinfectant (such as ClO₂ or O₃) must sample for TTHMs. However, a ground water system that uses an oxidant that is NOT a disinfectant (such as KMnO₄ for taste and odor oxidation) and does not add another disinfectant to their water, is not required to monitor for TTHMs.

Q: *Do systems that only add ozone have to monitor for TTHM and HAA5?*

A: Yes, all systems that supply water treated with a chemical disinfectant are required to monitor for TTHM and HAA5.

1.2.2 Bromate

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(80)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.53	Maximum Contaminant Level Goals
§141.64	Maximum Contaminant Levels
§141.131(b)(1), (2)	Analytical Requirements
§141.132(b)(3)(i), (ii)	Monitoring Requirements
§141.133(b)(2)	Compliance Requirements
§141.134(b)	Reporting and Recordkeeping Requirements

Q: *May bromate monitoring be modified for systems based on the population served (as TTHM and HAA5 monitoring is structured)?*

A: No, there are no provisions in the Stage 1 DBPR to monitor for bromate based on system type and/or size.

- Q:** *Do systems using low levels of ozone at the beginning of the plant for purposes of enhancing filtration need to test for bromate under this rule?*
- A:** Yes. The rule specifies that any community or nontransient noncommunity system that uses ozone, for disinfection or oxidation, must take one bromate sample per month per treatment plant using ozone at the entrance to the distribution system. (See §141.132(b)(3))

1.2.3 Chlorite

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(81)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.53	Maximum Contaminant Level Goals
§141.64	Maximum Contaminant Levels
§141.131(b)(1), (2)	Analytical Requirements
§141.132(b)(2)(i), (ii)	Monitoring Requirements
§141.133(b)(3)	Compliance Requirements
§141.134(b)	Reporting and Recordkeeping Requirements

- Q:** *May chlorite monitoring be modified for systems based on the population served (as TTHM and HAA5 monitoring is structured)?*
- A:** No, there are no provisions in the Stage 1 DBPR to monitor for chlorite based on system type and/or size.
- Q:** *Daily monitoring means 7 days a week. Some systems are not staffed on the weekend. Do systems that add chlorine dioxide need to have someone in on the weekend in order to stay in compliance?*
- A:** Yes, systems required to conduct daily monitoring under the Stage 1 DBPR will have to conduct this monitoring daily. The system has 3 or 5 years, depending on its source water type and size, to get the plant staffed for conducting the required monitoring or change their disinfectant. This monitoring is required and must be conducted daily due to the acute health risks associated with chlorine dioxide.
- Q:** *Can you use analytical methods other than those listed in the Federal Register?*
- A:** The methods in the rule must be used.
- Q:** *When we have to do additional sampling because of an exceedence of 1.0 mg/L chlorite at the entrance to the distribution system, say 1.5 mg/L, and chlorite in the distribution is less than that level, can we assume that if the level at the entrance to the distribution system is 1.2 mg/L, the level in the distribution will be lower and forego monitoring?*
- A:** If the system exceeds 1.0 mg/L, the system MUST conduct the additional monitoring (3 samples in the distribution system) the following day.

- Q:** *Do the MCL and monitoring requirements for chlorite apply to transient systems that use chlorine dioxide?*
- A:** The MCL and monitoring requirements for chlorite apply only to community and nontransient noncommunity systems that use chlorine dioxide. Chlorite is not regulated for transient systems.
- Q:** *Does EPA intend for daily chlorite samples to be sent out to a certified laboratory for analysis or could systems do hand held testing at the entrance to the distribution system for chlorite?*
- A:** The original rule requires that the analysis be performed by a certified laboratory, however, EPA updated the rule through technical corrections published in the *Federal Register* on January 16, 2001 to allow daily chlorite sampling and analysis to be performed by a party approved by the state.

1.3 Disinfection Byproduct Precursors

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(79)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.131(d)(1), (2), (3), (4), (5)	Analytical Requirements
§141.132(d)(1), (2)	Monitoring Requirements
§141.133(d)	Compliance Requirements
§141.134(d)	Reporting and Recordkeeping Requirements
§141.135 [entire part]	Treatment Technique for Control of DBP Precursors

- Q:** *Do lime softening plants need to consider alternative compliance criteria and/or Step 1 TOC removal requirements or can they go right to the Step 2 bench-scale testing?*
- A:** EPA believes that all lime softening plants will meet at least one of the alternative compliance criteria, one of the additional alternative compliance criteria for softening plants, or will be able to achieve step 1 TOC removal requirements. The Step 2 bench testing procedures are not designed for softening systems since the step 2 procedure is designed to lower pH while the softening process raises pH. Thus Step 2 does not apply to softening systems.
- Q:** *Some treatment plants operate seasonally. How do you determine quarterly averages?*
- A:** These systems must use the average of the available data in each quarter the plant operates.
- Q:** *Would you ever end up with a treated water TOC higher than an untreated source water TOC?*
- A:** This may happen as a result of the analytical methods used to measure TOC where minor variations (measurement error) may show a treated water TOC slightly higher than a source water TOC level.

- Q:** *When the treated water TOC level is greater than the untreated water TOC level, what number should be used in the monthly calculation?*
- A:** There are two ways to calculate compliance with the Step 1 TOC removal requirements. The first is to calculate the actual percentage of TOC removal from the source and treated waters for that month [141.135(c)(1)(i)]. In any month where the treated water TOC level is greater than the source water TOC level, the monthly calculation would be a negative number. Second, the system could use an alternative compliance calculation method. For example, if the system's treated or source water TOC is less than 2.0 mg/L the system would assign the value of 1.0 for that month. For any month that a system practicing softening removes at least 10 mg/L of hardness (as CaCO₃) the system would assign the value of 1.0 for that month [141.135(c)(2)(i)].
- Q:** *Does the addition of a disinfectant affect where and when source water TOC sampling is performed?*
- A:** Yes, TOC monitoring must occur before any disinfectant is added into the system.
- Q:** *If a system meets one of the alternative compliance criteria is it exempted from implementing enhanced coagulation?*
- A:** If a system meets one of the alternative compliance criteria as a running annual average, calculated quarterly, they are in compliance with the precursor removal treatment technique and do not have to meet the Step 1 TOC removal requirements. For those systems that must implement enhanced coagulation or enhanced softening, alternative compliance criteria can also be used for compliance calculations on a month-by-month basis. (See § 141.135(c)(2))
- Q:** *If a system has met the same alternative compliance criterion for the past four quarters does this mean it is in compliance for the previous year or for the following year?*
- A:** This system is in compliance for the previous year.
- Q:** *Does a system always have to use the same alternative compliance criterion to avoid employing enhanced coagulation?*
- A:** In order to avoid employing enhanced coagulation, the system must meet the same alternative compliance criterion for the past four quarters to calculate a running annual average. If it cannot meet this same criterion for four quarters, the system is required to perform enhanced coagulation and perform the compliance calculations required in §141.135(c). However, once a system is required to employ enhanced coagulation, they may employ alternative compliance criteria on a month-by-month basis (§141.135(c)(2)(i)-(v)) in lieu of performing the calculations in §141.135(c)(1). Alternative compliance criteria used on a month-by-month basis for calculating compliance can change depending on the time of year and the characteristics of the water.
- Q:** *If I meet an alternative compliance criterion for the month and have exceeded the Step 1 removal requirements, should I use 1.0 or the calculated number in my compliance calculations?*
- A:** You should use the calculated number, since if you exceed the Step 1 removal requirements, this number will be greater than 1.0. This number will “help” the quarterly average you calculate assuming you have a month where your TOC percent removal ratio is less than 1.0.

- Q:** *Does the state need to approve all TOC percent removal levels under the Stage 1 DBPR?*
- A:** The state is only required to approve the Step 2 removal levels, not the Step 1 TOC removal levels.
- Q:** *What should a conventional softening system do if it must meet the TOC removal requirements under the Stage 1 DBPR by dropping alkalinity and then must recarbonate to adjust pH and alkalinity for achieving compliance with the Lead and Copper Rule?*
- A:** The system may use either the TOC percentage removal requirement or the alternative compliance criteria (less than 60 mg/L (as CaCO₃) to comply with the rule. The system may then recarbonate to comply with the Lead and Copper Rule. Treated water alkalinity, for purposes of compliance with the Stage 1 DBPR, should be measured prior to recarbonation and may be measured anywhere in the treatment plant.
- Q:** *Do labs have to be certified to conduct TOC monitoring?*
- A:** A system must use a party approved by EPA or the state to measure TOC, with any of the methods specified in the regulations. Use of a certified laboratory is not required.
- Q:** *Is GAC effective in removing DBPs? May it be used by conventional plants in lieu of the treatment technique for DBP precursor removal under the Stage 1 DBPR?*
- A:** The system may use GAC if it provides adequate TOC removal to allow the system to meet either Step 1 or one of the alternative compliance criteria for finished water. GAC is effective depending on the type of carbon used, the contact time, and the nature of the DBPs. Depending on the type of carbon used, it can also be expensive and cause operational and disposal problems. EPA recommends that systems not use GAC for removal of DBPs after flocculation but instead use it for DBP precursor (TOC) removal, if necessary. GAC can be used to “enhance” enhanced coagulation and TOC removal in conventional plants. However, because GAC tends to work most effectively when used in tandem with enhanced coagulation rather than in lieu of, it is not normally a substitute for DBP precursor removal.
- Q:** *How often does a system doing Step 2 have to perform bench- or pilot-scale testing?*
- A:** The rule only requires that it be performed; the frequency is determined by the state. In the EPA guidance on Enhanced Coagulation, the recommended frequency for the Step 2 bench- or pilot-scale testing is at least quarterly for the first year. If source water quality changes significantly on a more frequent basis, Step 2 testing may need to be conducted more frequently. The minimum levels of TOC removal will be determined by this testing and established as regulatory requirements by the state.
- The guidance manual (EPA 815-R-99-012) is available at EPA’s website: www.epa.gov/safewater/mdbp/implement.html or from NSCEP at 1.800.490.9198.
- Q:** *Why are enhanced coagulation and enhanced softening only required at conventional plants?*
- A:** Enhanced coagulation and enhanced softening involve the addition of higher levels of coagulants (i.e., higher than is required for turbidity removal). Therefore, a sedimentation (solids removal) process is necessary to remove solids prior to filtration. Without sedimentation, the solids would plug the filters, and result in short filter runs and poor

operation. In the Stage 1 DBPR, the precursor removal requirements apply to those systems best able to remove DBP precursors at relatively low cost.

Q: *Do you change Step 2 TOC removal requirements when there is a routine seasonal change in source water quality?*

A: The frequency of the Step 2 bench- or pilot-scale testing is determined by the state. In the EPA guidance on Enhanced Coagulation, the recommended frequency for the Step 2 bench- or pilot-scale testing is at least quarterly for the first year. If source water quality changes significantly on a more frequent basis, Step 2 testing may need to be conducted more frequently. The minimum levels of TOC removal will be determined by this testing and established as regulatory requirements by the state. In addition, it may vary on a seasonal basis if approved by the state.

The EPA guidance manual (EPA 815-R-99-012) is available at www.epa.gov/safewater/mdpb/implement.html or from NSCEP at 1.800.490.9198

Q: *For the “simultaneous” paired sample, what is the time-lag allowed between samples (accounting for detention time)?*

A: The rule requires the paired samples to be collected “at the same time.” In practice EPA expects that systems will typically collect the source water sample followed, in a few minutes to a few hours, by the treated water sample. In situations where raw water quality fluctuates frequently, the system may need to provide a time-lag between the samples equal to the residence time of the water between sampling points. This will ensure the samples accurately reflect the actual TOC removal. In all cases systems should address their sampling procedure in their monitoring plans.

Q: *If a system treats blended water from two very different source waters (one source meets an alternative compliance criterion, the second source does not) may the system forego enhanced coagulation?*

A: The enhanced coagulation/enhanced softening requirements are based on the source water TOC and alkalinity. All measurements and compliance determinations must be made on the water that is actually treated in the plant under normal operating conditions. If that water is comprised of a blend from multiple sources, the composition of the blend will determine whether alternative compliance criteria are met or whether achieving the minimum TOC removal requirements of enhanced coagulation is necessary.

Q: *What if for one month water is not amenable to enhanced coagulation?*

A: Compliance is based on a running annual average. The system may elect to use the calculated data, use an alternative compliance criterion (if possible) that month, or apply for a Step 2 removal requirement for the month.

Q: *If a system is unable to meet any alternative compliance criteria or Step 1 TOC removal requirements in the first quarter of monitoring, can it decide to go to Step 2 immediately, rather than waiting for the full year of data collection?*

A: The system may elect to conduct the necessary bench-scale testing immediately but because compliance is based on a running annual average, the system is not eligible for Step 2 removal until one year of data have been collected.

- Q:** *If a system, through excessive lime softening, lowers the alkalinity to below 60 mg/L and/or removes at least 10 mg/L of magnesium hardness and, therefore, meets one or more of the compliance criteria, why does it need to do the TOC monitoring? Do states have the flexibility to allow such systems to forego TOC monitoring?*
- A:** States do not have the flexibility to allow systems to forego TOC monitoring. EPA believes that systems may not always meet one of the alternative compliance criteria, and that the system needs to have the data in such cases to determine compliance. Additionally, in order to qualify for, and remain on, reduced monitoring for TTHM and HAA5 these Subpart H systems must continue to perform monthly TOC monitoring of untreated source water.
- Q:** *If a softening system wishes to use the additional alternative compliance criteria for softening systems and its jar-testing demonstrates a finished water alkalinity below 60 mg/L, but samples in the plant that incorporate the prescribed coagulant dose still exceed 60 mg/L, is the system in compliance with the Step 2 requirements?*
- A:** There are no Step 2 provisions for softening systems. The alkalinity or magnesium hardness removal levels must be met in the full-scale plant. For non-softening systems, Step 2 determines a removal requirement, not a coagulant dose requirement.
- Q:** *How should the state deal with the situation where the full-scale results do not achieve the required step 2 TOC removals predicted by jar testing?*
- A:** Failure to meet step 2 TOC removal requirements results in a violation. The system should be encouraged to experiment with acids, alternative coagulants, etc. to improve TOC removal and ensure compliance.
- Q:** *May a system grandfather Step 2 jar testing results in advance of the effective date of the Stage 1 D/DBPR requirements provided that the system meets all the technical criteria specified in the rule?*
- A:** To meet the special primacy requirements, the state has to develop Step 2 methodology. If a system wishes to begin testing early, the system should ensure that the state has submitted its Step 2 methodology to EPA for approval.
- Q:** *If there is a group of surface water intakes close to each other, can they do one raw water TOC sample?*
- A:** No, Because the TOC levels in surface water can vary greatly by time and location in a water body. Plants are required to take TOC samples at each intake, because the samples must reflect the treated water samples.
- Q:** *Section 141.135(b)(3) says that once the state approves a Step 2 TOC removal percentage, the state may make that percentage retroactive. However, Section 141.133(d) says that systems which do not meet the Step 1 requirements during the first 12 months are not eligible for retroactive approval of Step 2 requirements. Which is correct?*
- A:** Both are correct. Section 141.133(d) limits what may be done in the first year for a system which elects to enter the compliance period uninformed. Systems may begin monitoring in 2001/2003 to determine whether Step 1 levels can be met. This monitoring is not mandatory and failure to monitor during the 12 months prior to the compliance date is not a violation. However, failure to conduct this monitoring makes a system ineligible for retroactive approval of a step 2 alternative TOC removal level during 2002/2004. After 2002/2004, all systems are eligible for retroactive step 2 approval, whether the early monitoring was conducted or not. The M-DBP FACA negotiating committee and EPA

believed that systems should not be allowed to claim ignorance of whether compliance had been achieved, but also recognized that future changes in source water quality may affect a system's ability to achieve compliance. To balance these two, the rule allows for retroactive approval of Step 2 criteria if the system has data that indicates that the system has taken prudent measures to comply. Failure to determine compliance status is not prudent. Such retroactive approval is not available for MCL compliance or for compliance with other treatment techniques.

Q: *How does a system that is treating for zebra mussel control by injecting chlorine at the intake collect untreated source water samples for TOC?*

A: The system may have to discontinue its chlorine feed for a brief period in order to collect the sample. Alternatively, the state may allow a grab sample at the entrance to the intake to the plant before any treatment. This situation should be addressed in the system's monitoring plan.

Q: *TOC measurements are limited to two significant figures. The use of these values in compliance calculations under §141.135(c) cannot produce a value with a greater number of significant figures. However, systems are required to compare the value calculated for compliance to 1.00 which has three significant figures. How do you reconcile this?*

A: The increase in significant figures was an oversight by EPA. The intent was for systems to compare the calculated value at two decimal places.

1.4 Monitoring

1.4.1 General Monitoring Issues

Q: *How do you determine TOC levels to qualify for or remain on reduced monitoring for TTHM and HAA5 if you have multiple treatment plants? Can you have reduced monitoring for one plant and not another? Or should all the plants be treated the same?*

A: Systems cannot be on reduced monitoring for TTHM and HAA5 at one of their plants and routine monitoring for another because compliance is based on the TTHM and HAA5 levels for the entire system. Each plant's source water TOC level must be less than or equal to 4.0 mg/L.

Q: *If you have both ground water and surface water the system is considered to be a Subpart H system. As a Subpart H system, is it required to follow the monitoring for Subpart H systems for all of their treatment plants including ground water plants?*

A: Yes. If the system is a Subpart H system the monitoring requirements for Subpart H systems apply to all plants whether ground water or surface water.

Q: *How does a system (either ground water or surface water) determine the month of warmest water temperature, when there is little or no temperature variability?*

A: To meet this requirement systems should regularly monitor their source and distribution water temperatures or use historical data. In cases where the water temperature is very constant, the system may consult with the state regarding the proper month in which to conduct sampling. The results of this consultation would then be incorporated into the

system’s monitoring plan. The state may also be able to better spread out the monitoring to avoid lab capacity issues.

1.4.2 Monitoring Plans

For further information, see the following rule sections:

Citation	Part Title
§141.132(a)(1), (2), (3)	Monitoring Requirements (General requirements)
§141.132(f)(1), (2), (3)	Monitoring Requirements (Monitoring plans)

- Q:** *Under the Stage 1 DBPR, when does the monitoring plan need to be completed?*
- A:** The monitoring plan must be complete and available for inspection by the state and public no later than 30 days following the applicable compliance dates in § 141.130(b). Subpart H systems > 3,300 must submit their monitoring plans with their first monitoring report.
- Q:** *Do all monitoring plans have to be reviewed and approved by the state to ensure the system is planning monitoring that will achieve compliance in all areas of the Stage 1 DBPR?*
- A:** States are encouraged to review or approve monitoring plans. States will generally check the monitoring plans during the sanitary surveys or other visits. Subpart H systems serving >3,300 must submit monitoring plans to the state for review. States may require plans to be submitted by any other system and may require changes to the plan.
- Q:** *How should a system determine residence times and conduct monitoring under the Stage 1 DBPR if it has a complicated distribution system?*
- A:** This should be addressed in the monitoring plan for the system and should be reviewed by the state to ensure the system will be in compliance. In the monitoring plan, the system should indicate why samples are being taken in a particular location. EPA intends for sites to be generally selected based on best professional judgement rather than on computer analyses and tracer studies.
- Q:** *Is there a restriction on how often a system can revise their monitoring plan?*
- A:** The frequency of allowable modifications to the monitoring plan is not addressed in the rule. Clearly changes in sources, disinfectants, etc. will make modifications necessary and sometimes unpredictable. EPA believes this is best left up to states’ discretion. Any time a Subpart H system serving greater than 3,300 people modifies its sampling plan, the system must submit this modified sampling plan to the state.

1.4.3 Multiple Wells Drawing from a Single Aquifer

For further information, see the following rule sections:

Citation	Part Title
§141.132(a)(2)	Monitoring Requirements (General requirements)

Q: *If a system has multiple wells drawing from the same aquifer, what is the monitoring frequency for TTHM and HAA5?*

A: The wells may be treated as one plant for the purposes of determining monitoring frequency for TTHM and HAA5. This is true even if each well or some of the wells have their own treatment.

Q: *If a system has one treatment plant with multiple wells from different aquifers, how is the monitoring frequency determined?*

A: If all the sources are combined into a single treatment plant, the number of samples required for that plant is determined by system size.

1.4.4 Reporting and Recordkeeping

For further information, see the following rule sections:

Citation	Part Title
§141.134(b)& (c)	Reporting and Recordkeeping Requirements

Q: *Section 141.134, reporting and recordkeeping requirements for TTHM/HAA5, chlorite, bromate, chloramines and chlorine, requires systems to report “whether the MCL (or MRDL) was exceeded.” The requirements for systems monitoring for chlorine dioxide, on the other hand, are to report “whether the MRDL was exceeded” and “whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or chronic.” Does the requirement to report “whether the MCL (or MRDL) was exceeded,” mean the system should report any single sample that exceeds the MCL (or MRDL) or only report exceedences that result in violations?*

A: For each compliance period, Systems are required to report results of all samples whether or not they exceed the MCL or MRDL, they are also required to report any violations of the MCL or MRDL, based upon the compliance determination for the monitoring period for which they are reporting.

1.4.5 Consecutive Systems

For further information, see the following rule sections:

Citation	Part Title
§141.132(f)(3)	Monitoring Requirements (Monitoring plans)

Q: *Will a wholesale system be required to change its treatment process if there is an MCL or MRDL exceedance in system that purchases its water?*

A: Each system is responsible for achieving and maintaining compliance. In most cases EPA expects wholesalers to cooperate with purchased water systems to ensure their compliance but, as previously mentioned, each water system is ultimately responsible for its own compliance.

Q: *Does this rule apply to consecutive systems that buy chlorinated water and that do not add a chemical disinfectant?*

A: EPA believes that all consumers should be protected against DBPs. EPA anticipates clarifying requirements for those systems in the Stage 2 DBPR. Until the Stage 2 rule is finalized, EPA anticipates that states will specify how consecutive systems that purchase disinfected water but do not add a disinfectant must monitor.

2.0 General Program Requirements

2.1 Primacy

Q: *If the state has a blanket letter from the Attorney General that covers all regulations, does it have to get a new letter specifically for the Stage 1 DBPR?*

A: Yes. States would not be able to use a letter from the Attorney General that provided certification of rules not in existence at the time the certification letter was written. The certification would also have to confirm that there are no state audit laws preventing enforcement of the rules.

Q: *Do you need to adopt the PWS definition (if applicable) and obtain administrative penalty authority in order to receive interim primacy for the Stage 1 DBPR?*

A: A state is eligible for interim primacy for new regulations provided they have primacy or interim primacy for all existing regulations. At a time when multiple regulations are being promulgated, a state qualifies for interim primacy for each rule as the rules are adopted by the state as long as the time period allowed for adoption (two years plus up to a two year extension, if applicable) has not expired. For example, even though the CCR was promulgated before the Stage 1 DBPR, a state can obtain interim primacy for the Stage 1 DBPR before the CCR, as long as the deadline to adopt the CCR has not passed. However, if time period allow for adoption of the CCR has passed and the state has not adopted the CCR, then the state would not be eligible for interim primacy for the Stage 1 DBPR.

- Q:** *Can states “bundle” regulations in their primacy revision package?*
- A:** Yes, states may combine two or more rules in one primacy revision package provided that the states’ adoption of the rules falls within the statutory two year period and two year extension period, if applicable.
- Q:** *May a state adopt the Stage 1 DBPR by reference?*
- A:** Yes, if the state law allows this. However, the state will still need to address the special primacy requirements which give the state flexibility and discretion in meeting certain requirements.
- Q:** *Our State’s Attorney General does not have the authority to approve regulations. Will this be a problem for us in terms of obtaining primacy for new rules?*
- A:** EPA does not require the State’s Attorney General to provide approval of regulations adopted for purposes of the state achieving primacy under these rules. The requirement is for a statement by the Attorney General, or the primacy agency’s attorney if it has independent legal council, that the laws and regulations adopted by the state were duly adopted and are enforceable.

2.2 Violations, SDWIS Reporting and SNC Definitions

- Q:** *If a system receives 2 treatment technique violations in 1 month, is that counted as two TT violations toward SNC?*
- A:** Yes.
- Q:** *How frequently are SNC determinations made? Can a system potentially receive a SNC designation every month? every quarter? every year?*
- A:** Significant Non-Compliance (SNC) determinations for all rules, including the Interim Enhanced Surface Water Treatment Rule (IESWTR) and the Stage 1 Disinfectants/Disinfection Byproducts Rule (DBPR), are made once per quarter, compounding over a rolling four quarter period. SDWIS guidance states that these determinations are made on the first day of the month following the end of the quarter which covers the 12 month compliance period which ended the previous quarter.

2.3 Qualified Operators

- Q:** *There is a requirement of the SWTR that the systems be operated by qualified personnel. What if the system has a membrane plant that is not operated on a full time basis? EPA has not mandated the number of hours in a operating cycle and systems have been installing membrane plants to prevent being required to have a full-time operator.*
- A:** Both the Surface Water Treatment Rule and the Stage 1 Disinfectants/Disinfection Byproducts Rule require regulated systems to be operated by qualified personnel who meet the requirements specified by the state and are included in a state register of qualified operators. The rules do not, however, address the amount of time qualified operators are required to spend on site at the plant. EPA believes that this type of determinations should be left to the states’ discretion.

- Q:** *Who in the state must maintain the list of qualified operators? Is it acceptable if the Public Water Supply Supervision Program (PWSS) does not maintain the list, but another agency in the state does?*
- A:** Yes, it is acceptable for a state agency other than the primacy agency to maintain the state's register of qualified operators. It is essential, however, for the PWSS Program to have access to that register.

IV-E. Determining Monitoring Frequency for TTHM and HAA5 Sampling

The number of samples a system must take for TTHMs & HAA5s is based upon the type of water (surface water or ground water or combination of both), population size, and the number of water treatment plants (WTPs) a system has. However, this determination is sometimes complicated due to the many different configurations a system may have. The following examples help illustrate the WTP concept for determining the number of samples a system must take for TTHMs & HAA5s.

Surface Water Sources

ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5 (§141.132)

<u>Type of system</u>	<u>Minimum Monitoring Frequency</u>
Surface water or ground water under direct influence of surface water serving at least 10,000 persons	Four water samples per quarter per treatment plant
Surface water or ground water under direct influence of surface water serving from 500 to 9,999 persons	One water sample per quarter per treatment plant
Surface water or ground water under direct influence of surface water serving fewer than 500 persons	One sample per year per treatment plant during month of warmest water temperature

- S1 A system serves \$10,000 people and has two surface water treatment plants. However, the water from both plants is combined prior to entering the distribution system. How many WTPs does this system have?

This system has one WTP and would take four samples per quarter. In general, as long as the water is combined and therefore being mixed prior to entering the distribution system the system has one WTP for monitoring purposes.

- S2 A system serves \$10,000 people and has two surface water treatment plants that are drawing water from the same river but at different locations and enter the distribution system at different locations. How many WTPs does this system have?

This system has two WTPs and would take eight samples per quarter. They are considered two WTPs even though they draw water from the same river because the treatment in the two plants cannot be exactly the same. Additionally, the treated waters do not have an opportunity to mix prior to entering the distribution system because they enter at two different locations.

- S3 A system serves \$10,000 people and has one surface water treatment plant. The system also utilizes another surface water treatment plant during high demand times from May to September. During these high demand times, water from the second plant enters the distribution system at a different location from the first plant. How many WTPs does this system have?

This system would have one WTP in the first and fourth quarters and would take four samples per quarter for those quarters. However, for the second and third quarters this system would have two WTPs and would need to take eight samples per quarter for those quarters.

Ground Water Sources

ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5 (§141.132)

<u>Type of system</u>	<u>Minimum Monitoring Frequency</u>
System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons	one water sample per quarter per treatment plant ¹
System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons	one sample per year per treatment plant ¹ during month of warmest water temperature

¹Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with state approval.

- G1 A system serves \$10,000 people and has thirty-three wells that the state has determined all come from one aquifer. The water from these wells enter the distribution system in thirty-three different locations. How many WTPs does this system have?

This system has one WTP and would take one sample per quarter. In general, as long as the wells have been determined by the state to come from the same aquifer, the system has one WTP for monitoring purposes.

- G2 A system serves \$10,000 people and has twenty-eight wells that the state has determined to come from fourteen aquifers. All the wells enter the distribution system in different locations. How many WTPs does this system have?

This system has fourteen WTPs and would take fourteen samples per quarter.

- G3 A system serves \$10,000 people and has ten wells that the state has determined to come from ten aquifers. The wells are paired such that two wells go into one pipe where the water is disinfected and then enters the distribution system in five different locations. How many WTPs does this system have?

This system would have five WTPs and would have to take five samples per quarter. The number of WTPs is reduced because the water from each pair of wells are combined into a single pipe, treated and mixed prior to entering the distribution system.

- G4 A system serves \$10,000 people and has ten wells that the state has determined to come from ten different aquifers. These wells enter the distribution system at ten different locations. However,

the system only uses all ten wells during high demand times from May through August. The remainder of the year, the system only uses five wells. How many WTPs does this system have?

This system would have five WTPs in the first and fourth quarters and would take five samples per quarter for those quarters. For the second and third quarters this system would have ten WTPs and would take ten samples per quarter for those quarters.

MIXED SOURCES (SURFACE WATER AND GROUND WATER)

SG1 A system serves \$10,000 people and has one surface water treatment plant. The system also purchases finished surface water from one system and disinfected ground water from another system. The purchased surface water and purchased ground water are not further disinfected. All three sources of water enter the distribution system at different locations. How many WTPs does this system have?

This system has one WTP and would take four samples per quarter. However, the three sources represent three different qualities of water with differing treatment and DBP formation potential. This system could be considered as having three WTPs and therefore would take twelve samples per quarter, but there is no federal requirement to do so.

SG2 A system serves \$10,000 people and has one surface water treatment plant. The system also purchases finished surface water from one system and disinfected ground water from another system. The purchased surface water and purchased ground water are further disinfected by the purchasing system. All three sources of water enter the distribution system at different locations. How many WTPs does this system have?

Since a disinfectant has been added to the purchased sources, the Stage 1 DBPR applies to all three sources. This system would have three WTPs and would take twelve samples per quarter.

SG3 A system serves \$10,000 people and has one surface water treatment plant and another water treatment plant from wells drawing from a single aquifer. How many WTPs does this system have?

Since the system uses surface water, the monitoring requirements for subpart H systems (SW or GWUDI) take precedence and apply to all WTPs irrespective if they are from ground or surface water. This system would have two WTPs and would have to collect eight samples per quarter.

SG4 A system serves \$10,000 people and has a water treatment plant from wells the state has determined are drawing water from a single aquifer. This system also supplements their supply with a surface water treatment plant in the second and third quarters. Both sources enter the distribution system at different locations. How many WTPs does this system have?

This system would have one WTP in the first and fourth quarters and would take one sample per quarter for those quarters. However, since the system uses surface water in the second and third quarters, the monitoring requirements for subpart H systems (SW or GWUDI) take precedence.

This system would have two WTPs in the second and third quarters and would have to collect eight samples per quarter for those quarters.

SG5 A system serves 10,000 people and has eighty-six wells that the state has determined to come from thirty-eight aquifers. The system also has three surface water treatment plants. The water from one of the surface water treatment plants is purchased from another system. Water from all the sources are combined into one pipe prior to entering the distribution system. How many WTPs does this system have?

This system has one WTP since all the sources are combined prior to entering the distribution system and would have to take four samples per quarter since the system uses surface water. In general, as long as the water is combined and therefore being mixed prior to entering the distribution system the system has one WTP for monitoring purposes.