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Implementation Guidance for the Interim Enhanced Surface Water Treatment Rule and the Stage 1 Disinfectants/Disinfection Byproducts Rule

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Introduction

The purpose of this guidance manual is to provide aid to EPA, States, and public water systems (PWSs) for the implementation of the Interim Enhanced Surface Water Treatment Rule (IESWTR) and the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). These rules were published concurrently in the *Federal Register* on December 16, 1998.

This manual was developed through a workgroup process involving Regions, States, and Stakeholders, and contains the following sections:

Section I summarizes the IESWTR and Stage 1 DBPR and presents timetables and timelines of important dates of these rules. Section II addresses violation determination and associated reporting requirements, including compliance flowcharts and violation tables 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. Appendices A and B contain the Final IESWTR and Final Stage 1 DBPR, respectively, including the preambles to the rules. Appendix C contains the Primacy Revision Application crosswalks for both rules. Appendix D contains a sample Memorandum of Understanding between EPA and the States which will allow States and EPA to document how they will share rule implementation responsibilities if the State does not submit a primacy application by the deadline. Appendices E and F contains Safe Drinking Water Information System (SDWIS) contaminant codes and flowcharts describing SDWIS reporting. Appendix G contains additional violation tables arranged for data management and enforcement purposes. Appendix H 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 I contain Plain English summaries of each rule. Appendix J contains training presentation materials for each rule .

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Section I.

Rule Requirements

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A. Key Dates of the Rules

A1. Key Dates for the IESWTR

The compliance date for the Interim Enhanced Surface Water Treatment Rule (IESWTR) is January 1, 2002. Several provisions, including disinfection profiling and benchmarking and restrictions on uncovered finished water storage facilities, however, will require compliance before the primary compliance date. The timetable for the IESWTR is presented in Figure 1.

Figure 1: PWS Timetable for the IESWTR Requirements

Date from Rule Publication	IESWTR Requirement
December 16, 1998	Rule is published in Federal Register [63 FR 241 69478].
February 16, 1999	60-day legal challenge period ends.
February 16, 1999	Construction of uncovered finished water storage reservoirs is prohibited [§141.170(c)].
March 1999	TTHM and HAA5 monitoring must begin for systems that do not have ICR or occurrence data and wish to determine if they must develop a disinfection profile [§141.172(a)(2)(iii)].
April 1999	Systems that have 4 consecutive quarters of HAA5 occurrence data that meet the TTHM monitoring requirements must submit those data to the State to determine if they must develop a disinfection profile [§141.172(a)(5)(ii)].
December 16, 2000	Final primacy applications must be submitted to EPA unless granted an extension [§141.12(b)(i)]
December 31, 1999	TTHM and HAA5 data are due for those systems that collected data under the ICR to determine if they must develop a disinfection profile [§141.172(a)(5)(i)].
December 31, 1999	Systems that elect to profile without conducting 4 quarters of TTHM and HAA5 monitoring must notify the State of their election [§141.172(a)(5)(iv)].
December 31, 1999	Systems that wish to request State approval of "a more representative annual data set" than the ICR data set to determine if they must develop a disinfection profile must do so in writing [§141.172(a)(5)(v)].
March 31, 2000	TTHM and HAA5 and monitoring must be complete for systems determining if they must develop a disinfection profile [§141.172(a)(2)(iii)].
March 31, 2000	Systems determining if they must develop a disinfection profile must submit their TTHM and HAA5 data to the State [§141.172(a)(5)(iii)(A)].
April 1, 2000	Systems must begin developing a disinfection profile if either their annual average TTHM ≥ 0.064 mg/L or their annual average HAA5 ≥ 0.048 mg/L [§141.172(b)(2)].
April 1, 2000	If system is using 3 years of existing operational data to develop the disinfection profile, the profile generated from these data and a request for State approval must be submitted [§141.172(b)(3)(i)].
April 1, 2001	Disinfection profile is complete [§141.172(b)(ii)].
December 31, 2001	Systems that were required to develop a disinfection profile that wish to make a significant change to their disinfection practice after this date must first calculate a disinfection benchmark and consult with the State [§141.170(a)].

IESWTR

Date from Rule Publication	IESWTR Requirement
December 31, 2001	Systems that are not required to filter must comply with the requirements for TTHM in §141.12 and §141.30 until this date. After this date, systems must comply with the requirements in Subpart L for TTHM, HAA5, bromate, chlorite, chlorine, chloramines, and chlorine dioxide [§141.71(b)(6)].
December 31, 2001	Systems that do not meet all of the criteria for avoiding filtration and use conventional/direct filtration must meet the turbidity requirements of the rule (0.3 NTU CFE 95 percent of the time, at no time exceed 1 NTU) [§141.73(a)(3)].
December 31, 2001	Alternative technologies for systems that serve at least 10,000 people must remove 99 percent of *Cryptosporidium* oocysts, and the State must establish alternative turbidity performance standards that must be met 95 percent of the time [§141.73(d)].
December 2001	States must begin first round of sanitary surveys for all Subpart H Systems.
January 1, 2002	Systems must comply with the reporting and recordkeeping requirements of §141.175, including turbidity exceptions reporting. Systems must, when appropriate: • Produce filter profiles or identify obvious reason for poor filter performance • Report profile has been produced or identify obvious reason for poor filter performance • Conduct filter self-assessments • Have 3rd party CPEs performed
January 1, 2002	Requirements of Subpart P generally apply to Subpart H systems that serve at least 10,000 people [§141.170(a)].
December 16, 2002	Final primacy revisions applications with extensions must be submitted to EPA [§142.12(b)(2)].
December 2004	State must have first round of sanitary surveys completed for Subpart H CWSs [142.161].
December 2006	State must have first round of sanitary surveys completed for Subpart H CWSs with "outstanding performance" and Subpart H NCWSs.

A2. 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 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 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 Figure 2.

Figure 2: PWS Timetable for the Stage 1 DBPR Requirements

Date from Rule Publication	DBPR Requirement
December 16, 1998	Rule is published in Federal Register [63 FR 241 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 must be used [§141.131(a)].
December 2000	Large surface water and GWUDI (Subpart H) systems may begin monitoring to determine Step 1 TOC removals before the compliance date.
January 1, 2002	Large Subpart H CWSs and NTNCWSs must comply with the MCLs for TTHM, HAA5, bromate, and chlorite [§141.64(b)(1)].
January 1, 2002	Large Subpart H CWSs and NTNCWSs must comply with the MRDLs for chlorine, chloramines, and chlorine dioxide [§141.65(b)(1)].
January 1, 2002	Large Subpart H TNCWSs that use chlorine dioxide must comply with the MRDL for chlorine dioxide [§141.65(b)(2)].
January 1, 2002	Requirements of Subpart L generally apply to large Subpart H CWSs and NTNCWs [§141.130(b)(1)]. • Monitoring requirements • Reporting and recordkeeping requirements • Compliance • Treatment technique for control of DBP precursors
January 1, 2002	Large Subpart H TNCWSs that use chlorine dioxide must comply with requirements for chlorine dioxide and chlorite [§141.65(b)(2)].
January 1, 2002	Small Subpart H systems may begin monitoring to determine Step 1 TOC removals before the compliance date.
January 1, 2004	Small Subpart H and ground water CWSs and NTNCWSs must comply with the MCLs for TTHM, HAA5, bromate, and chlorite [§141.64(b)(1)].
January 1, 2004	Small Subpart H and ground water CWSs and NTNCWSs must comply with the MRDLs for chlorine, chloramines, and chlorine dioxide [§141.65(b)(1)].
January 1, 2004	Small Subpart H and ground water TNCWSs that use chlorine dioxide must comply with the MRDL for chlorine dioxide [§141.65 (b)(2)].

Date from Rule Publication	DBPR Requirement
January 1, 2004	Requirements of Subpart L generally apply to small surface water and GWUDI and ground water CWSs and NTNCWs [§141.130(b)(1)]. • Monitoring requirements • Reporting and recordkeeping requirements • Compliance • Treatment technique for control of DBP precursors
January 1, 2004	Small Subpart H TNCWSs that use chlorine dioxide must comply with requirements for chlorine dioxide and chlorite [§141.130(b)(2)].
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. [§141.135(a)(2)(iii)].

B. Rule Executive Summaries

B1. IESWTR

Purpose

The purpose of this summary is to acquaint State decision-makers and public health officials with the Interim Enhanced Surface Water Treatment Rule (IESWTR). The IESWTR, published in the Federal Register on December 16, 1998 (63 FR 69477; www.epa.gov/OGWDW/mdbp/ieswtrfr.html), 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 IESWTR is designed to address the health risks from microbial contaminants without significantly increasing the potential risks from chemical contaminants. This rule was published concurrently with the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR), which will address control of disinfectants and their byproducts.

Background

In 1990, EPA's Science Advisory Board, an independent panel of experts established by Congress, sited 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).

One of the key regulations EPA has developed to date to counter pathogens in drinking water is the 1989 Surface Water Treatment Rule (SWTR). Among its provisions, 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. The goal of the SWTR is to reduce risk to less than one infection per year per 10,000 people. However, the SWTR's limitation is that the source water of some systems has high pathogen concentrations that, when reduced by 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 addition to these microbial issues, there is another potentially confounding public-health concern. The disinfectants used to control pathogens may react with organic chemicals in the source water to produce potentially toxic or carcinogenic DBPs (see the Stage 1 DBPR Executive Summary). Thus, the dilemma facing water supply professionals is how to minimize the risk from both microbial pathogens and DBPs simultaneously.

Development of the IESWTR

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. To address the complex issues associated with regulating microbial pathogens, EPA first launched a rule-making process in 1992 and convened a Regulatory Negotiation (RegNeg) Advisory Committee under the Federal Advisory Committees Act (FACA), representing a range of stakeholders affected by possible regulation. The RegNeg Committee met repeatedly over a period of 10 months and arrived at a consensus proposal for taking progressive steps toward addressing both DBPs and microbial pathogens. The 1992 consensus-building process resulted in the three following regulatory proposals—

N. 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;

O. 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,

P. An Information Collection Rule (ICR) to collect information necessary to reduce many key uncertainties prior to subsequent negotiations for the Stage 2 DBPR.

Congress amended the Safe Drinking Water Act (SDWA) in 1996 and affirmed the strategy developed by the RegNeg Committee. Congress also established a series of new statutory deadlines for the rules.

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. The IESWTR, as structured today, is the result of the FACA process.

Benefits of the IESWTR

The IESWTR will improve public health by increasing the level of protection from exposure to *Cryptosporidium* and other pathogens in drinking water supplies through improvements in filtration at water systems. According to the risk assessment performed for the Regulatory Impact Analysis, the IESWTR decreases the likelihood of endemic illness (constant, low-level presence of a disease or infection) from *Cryptosporidium* by 110,000 to 463,000 cases annually. Based on these values, the estimated annual benefits of reducing the illness range from $0.263 billion to $1.240 billion per year. This calculation is based on a valuation of $2,000 per incidence of cryptosporidiosis prevented. The IESWTR will also reduce the risk of more severe health impacts on sensitive populations, including the risk of mortality. Additionally, the IESWTR will reduce the likelihood of outbreaks of cryptosporidiosis and its associated costs by providing a larger margin of safety against such outbreaks in some systems.

Applicability and Compliance Dates

The IESWTR applies to public water systems (PWSs) that use surface water or ground water under the direct influence of surface water (GWUDI) as a source and serve 10,000 or more people. Additionally, it establishes a schedule by which States are required to conduct sanitary surveys for *all* surface water and GWUDI PWSs.

Systems must comply with the turbidity and monitoring requirements, the primary requirements of the IESWTR, no later than December 31, 2001 (36 months after publication of the rule). However, PWSs with elevated levels of DBPs (Total Trihalomethanes—TTHM; and five haloacetic acids—HAA5) are required to develop an evaluation of their existing disinfection practices—a *disinfection profile*—no later than March 31, 2000 (27 months after publication).

Requirements of the Rule: Public Water Systems

Disinfection profiling and benchmarking

Surface water or GWUDI systems having average annual TTHM ≥ 0.064 mg/L or annual average HAA5 ≥ 0.048 mg/L must develop a *disinfection profile*. The disinfection profile is a compilation of daily criteria that affect the efficacy of the disinfection process (microbial inactivation potential) collected over the period of 1 year. From the disinfection profile, the PWS calculates the average microbial inactivation potential for each month, and the lowest monthly average inactivation becomes the *disinfection benchmark*.

The purpose of these provisions is to provide a process whereby a PWS and the State, working together, assure that there will be no significant reduction in microbial protection as the result of disinfection practice modifications designed to meet the more restrictive Maximum Contaminant Levels (MCLs) for DBPs established in the Stage 1 DBPR. If a PWS required to develop disinfection profiles subsequently wishes to modify its disinfection practices to meet the new MCLs, it must establish the disinfection benchmark and consult with the State prior to implementing such modifications. In addition, PWSs must keep the disinfection profile on file for the State to review during their sanitary surveys.

Cryptosporidium

The IESWTR sets a maximum contaminant level goal (MCLG) of zero for the protozoan *Cryptosporidium*. It also establishes a requirement for 2-log removal of *Cryptosporidium* for systems that must currently filter under the SWTR. Systems that use conventional or direct filtration are assumed to meet this requirement if they are in compliance with the strengthened turbidity performance standards for combined filter effluent in the IESWTR (discussed below). Systems that use slow sand or diatomaceous earth filtration are assumed to meet the 2-log removal requirement if they are in compliance with the existing turbidity performance standards under the SWTR.

The IESWTR also extends the existing watershed control requirements for unfiltered systems to include the control of potential sources of *Cryptosporidium*. Such sources must be included in an unfiltered system's watershed control plan.

IESWTR

Strengthened turbidity requirements

The IESWTR includes a series of requirements related to turbidity. These requirements strengthen current SWTR requirements for combined filter effluent for systems that use conventional or direct filtration. The turbidity level of a system's combined filtered water at each plant must be less than or equal to 0.3 nephelometric turbidity units (NTUs) in at least 95 percent of the measurements taken each month, and the turbidity level of a system's combined filtered water must at no time exceed 1 NTU (under the SWTR, these turbidity requirements are 0.5 NTU and 5 NTU, respectively).

Individual filter monitoring requirements

The IESWTR introduces continuous turbidity monitoring for individual filters. The rule requires that surface water systems that use conventional or direct filtration must conduct continuous turbidity monitoring on the effluent of each individual filter. PWSs must report instances of poor filter performance to the State, and, based on performance triggers, must take prescribed actions to identify and correct the cause(s).

Uncovered finished water storage facilities

The rule prohibits building any uncovered finished water storage facility (reservoir, holding tank, or other storage facility) for which construction begins after February 16, 1999 (60 days after publication).

Public water system recordkeeping and reporting requirements

The IESWTR requires PWSs to report monitoring and compliance data to States within 10 days after the end of each month the system serves water to the public. Additionally, PWSs must submit filter profiles, filter self-assessments, or Comprehensive Performance Evaluation (CPE) reports when instances of poor filter performance occur or persist based on monitoring of individual filter performance.

Requirements of the Rule: States or Other Primacy Agents

Sanitary surveys

The IESWTR requires that the State must conduct sanitary surveys for *all* PWSs using surface water or GWUDI, *regardless of the population the PWS serves*, no less frequently than every 3 years for community water systems and every 5 years for noncommunity systems. For community water systems determined by the State in previous sanitary surveys to have "outstanding performance," successive sanitary surveys may be conducted at up to 5-year intervals.

States must have rules or other authority to ensure that a PWS responds to any "significant deficiencies" revealed during its survey within 45 days, indicating how and on what schedule the system will address the deficiencies noted in the survey. States must also have rules or other authority to ensure that facilities take the steps necessary to address significant deficiencies identified in the survey report that are within the control of the PWS and its governing body.

State primacy, recordkeeping, and reporting requirements

In order to receive primacy for the IESWTR, States must adopt regulations no less stringent than this rule. In addition, States are required to explain, through responses to special primacy requirements, how they will implement the key provisions in the rule. States must have rules or other authority to require PWSs to respond to significant deficiencies uncovered in a sanitary survey, to conduct a Composite Correction Program (CCP), and to assure that PWSs implement any follow-up recommendations that result from the CCP. States must submit revisions to their programs, regulations, or authorities no later than December 16, 2000 (2 years after rule publication), although States can request an extension of up to 2 years (December 16, 2002).

States must keep records of PWS turbidity measurements, PWSs required to do filter self-assessment reports, CPEs, CCPs, PWSs consulting with the State concerning modifications to disinfection practices, and decisions for PWSs using alternative filtration technology.

More information can be obtained from:

A. The Interim Enhanced Surface Water Treatment Rule
63 FR 69477 (December 16, 1998); and
www.epa.gov/OGWDW/mdbp/ieswtrfr.html

B. The EPA Safe Drinking Water Hotline, Telephone: 1.800.426.4791

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B2. The Stage 1 DBPR

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 69389; www.epa.gov/OGWDW/mdbp/dbpfr.html), 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 will address control of microbial pathogens.

Background

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 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 (see the IESWTR Executive Summary). Much of the population is exposed to these risks; therefore, a substantial concern exists.

Health risks associated with some DBPs are currently addressed by the Total Trihalomethanes (TTHM) regulation for public water systems (PWSs) serving 10,000 or more people. EPA, however, believes that the promulgation of the Stage 1 DBPR will significantly decrease the risks posed by DBPs and disinfectants. The Stage 1 DBPR will broaden public health protection by covering many PWSs not currently regulated for TTHM or other DBPs.

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. To address the complex issues associated with regulating microbial pathogens, 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 RegNeg Committee met repeatedly over a period of 10 months and arrived at a consensus proposal for taking progressive steps toward addressing both DBPs and microbial pathogens. The 1992 consensus-building process resulted in the three following regulatory proposals—

Stage 1 DBPR

Q. 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;

R. 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,

S. An Information Collection Rule (ICR) to collect information necessary to reduce many key uncertainties prior to subsequent negotiations for the Stage 2 DBPR.

Congress amended the Safe Drinking Water Act (SDWA) in 1996 and affirmed the strategy developed by the RegNeg Committee. Congress also established a series of new statutory deadlines for the rules.

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. The Stage 1 DBPR, as structured today, is the result of the FACA process.

Benefits of the Stage 1 DBPR

The Stage 1 DBPR is expected to reduce the 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 DPBs 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 *all* community water systems (CWSs) and nontransient noncommunity water systems (NTNCWSs) *that treat their water with a chemical disinfectant for either primary or residual treatment.* In addition, certain requirements apply to transient noncommunity water systems (TNCWSs) that use chlorine dioxide.

Subpart H systems (PWSs that use 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 no later than December 31, 2001 (36 months after publication). Such systems that plan to install granular activated carbon or membrane technologies to comply may apply to the State for an extension of up to 24 months (January 1, 2004). Subpart H systems that serve fewer than 10,000 people, and all affected ground water systems, must comply with the requirements no later than December 31, 2003 (60 months after publication).

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 set at concentrations at which no know or anticipated adverse health effects are expected to occur. They are non-enforceable public health goals. MCLs are enforceable contaminant standards that are feasible to achieve.

Disinfection Byproduct	MCLG (mg/L)	MCL (mg/L)
Total Trihalomethanes (TTHM)		**0.080**
Chloroform	0	
Bromodichloromethane	0	
Bromoform	0	
Dibromochloromethane	0.06	
Five Haloacetic Acids (HAA5)		**0.060**
Monochloroacetic Acid		
Dichloroacetic Acid	0	
Trichloroacetic Acid	0.30	
Monobromoacetic Acid		
Dibromoacetic Acid		
Chlorite	**0.80**	**1.0**
Bromate	**0**	**0.010**

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	4.0
Chloramines	4	4.0
Chlorine Dioxide	0.8	0.8

Stage 1 DBPR

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 that indicate removal of DBPPs is unnecessary or impractical.

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. For 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:

A. The Stage 1 Disinfectants/Disinfection Byproducts Rule
63 FR 69389 (December 16, 1998); and
www.epa.gov/OGWDW/mdbp/dbpfr.html

B. The EPA Safe Drinking Water Hotline, Telephone: 1.800.426.4791

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Section II.

Violation Determination, SDWIS Reporting, and SNC Definitions

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A. SDWIS Reporting

The following page is a summary of Safe Drinking Water Information System (SDWIS) reporting requirements for the IESWTR and DBPR. A detailed list of violations is provided in Appendix G. Appendix G is intended for use by programmers and for enforcement. The appendix is an easy reference to all violations of the rules. A user can reference Appendix G to better understand violations in SDWIS. Also, the reference can be used to determine how violations of the rules can be entered into SDWIS

A1. Proposed Federal Reporting (States Report Only When Violations Occur) for IESWTR

Interim Enhanced Surface Water Treatment Rule

Violation Code	Contaminant Code	Treatment Technique Violations
43	0300	Combined filter effluent exceeds 1 NTU
44	0300	More than 5% of monthly combined filter effluent samples exceed 0.3 NTU.
47	0300	Construction of an uncovered finished storage facility
48	0300	Failure to meet Cryptosporidium site specific conditions (UF)
37	0300	Failure to profile or consult w/state (disinfenction changes)
		Monitoring and Reporting Violations
38[1]	0300	**Major:** Failure to collect 90% of required sample.
		Minor: Any other failure to monitor or report
29	0300	**Major:** Response to individual filter performance trigger

A2. Proposed Federal Reporting (States Report Only When Violations Occur) for DBPR

Disinfection Byproduct Rule

Violation Code	Contaminant Code	MCL and MRDL Violations
02	2950	Total Trihalomethanes (MCL)
02	2456	Haloacetic Acids (MCL)
02	1011	Bromate (MCL)
02	1009	Chlorite (MCL)
11	0999	Chlorine (MRDL)
11	1006	Chloramines (MRDL)
11[2]	1008	Chlorine Dioxide (Acute and Non-Acute) (MRDL)
		Treatment Technique Violation
12	0400	Failure to have qualified operator
46	2920	DBP Precursor Removal (DBP)/(TOC).
		Monitoring and Reporting Violations
27[3]	0400	**Major**: Failure to collect 90% of required samples.
		Minor: Any other failure to monitor or report

Stage 1 DBPR and IESWTR

		Public Notification - Both Rules
06	0400/0300	Failure to notify public after a violation.

[1] The SDWIS/FED Major/Minor flag will be used for M/R Violations

[2] For Chlorine Dioxide, the Major/Minor flag will be used. Major will indicate acute MRDL violation.

[3] The SDWIS/FED Major/Minor flag will be used for M/R Violations

B. SNC Definitions

The following pages are proposed SNC definitions for the IESWTR and DBPR. The SNC definition for the IESWTR is based largely on precedents from the SWTR. The definitions for both rules have been presented at State-EPA meetings and have been improved to reflect comments received.

B1. SNC Definitions—IESWTR

NOTE: SNC Definitions for the Surface Water Treatment Rule continue to remain in effect.

UNFILTERED AVOIDING FILTRATION

- Systems which fail avoidance criteria must filter. See 6/27/90 Surface Water Treatment Rule Implementation Manual. Systems become a SNC if filtration is not installed within 18 months of any failure of the avoidance criteria.
- A system that has three (3) or more Major M/R violations in any 12 consecutive months.
- A system that has a combination of five (5) or more Major M/R violations, and/or Minor M/R violations in any 12 consecutive months.

FILTERED

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

DISINFECTION PROFILING (if required)

- Failure to consult with the State before making a significant disinfection change if required to develop a disinfection profile.

UNCOVERED RESERVOIRS

- Beginning construction of any uncovered finished water storage facility after February 1999.

B2. SNC Definitions—DPBR

MONTHLY (or more frequent) Compliance Determinations
(excluding chlorine dioxide)

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

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

QUARTERLY Compliance Determinations

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

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

YEARLY OR LESS Compliance Determinations

- A system which has one (1) MCL violation in any compliance cycle.

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

CHLORINE DIOXIDE:

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

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

TTHM

- Failure to consult with the State before making a significant disinfection change.

Section III.

State Primacy Revision Applications

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A. 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."

B. State Primacy Program Revisions

Pursuant to §141.12, **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 Figure 3). 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, a Memorandum of Understanding (MOU) outlining the State's and EPA's responsibilities is required.

Figure 3: 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 Regulation Crosswalk	September 1999
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 December 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	3 years after publication

* An extension of up to 2 additional years may be requested by the State. EPA suggest submitting an application by September 2000.

B1. 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 4 diagrams these processes and their timing.

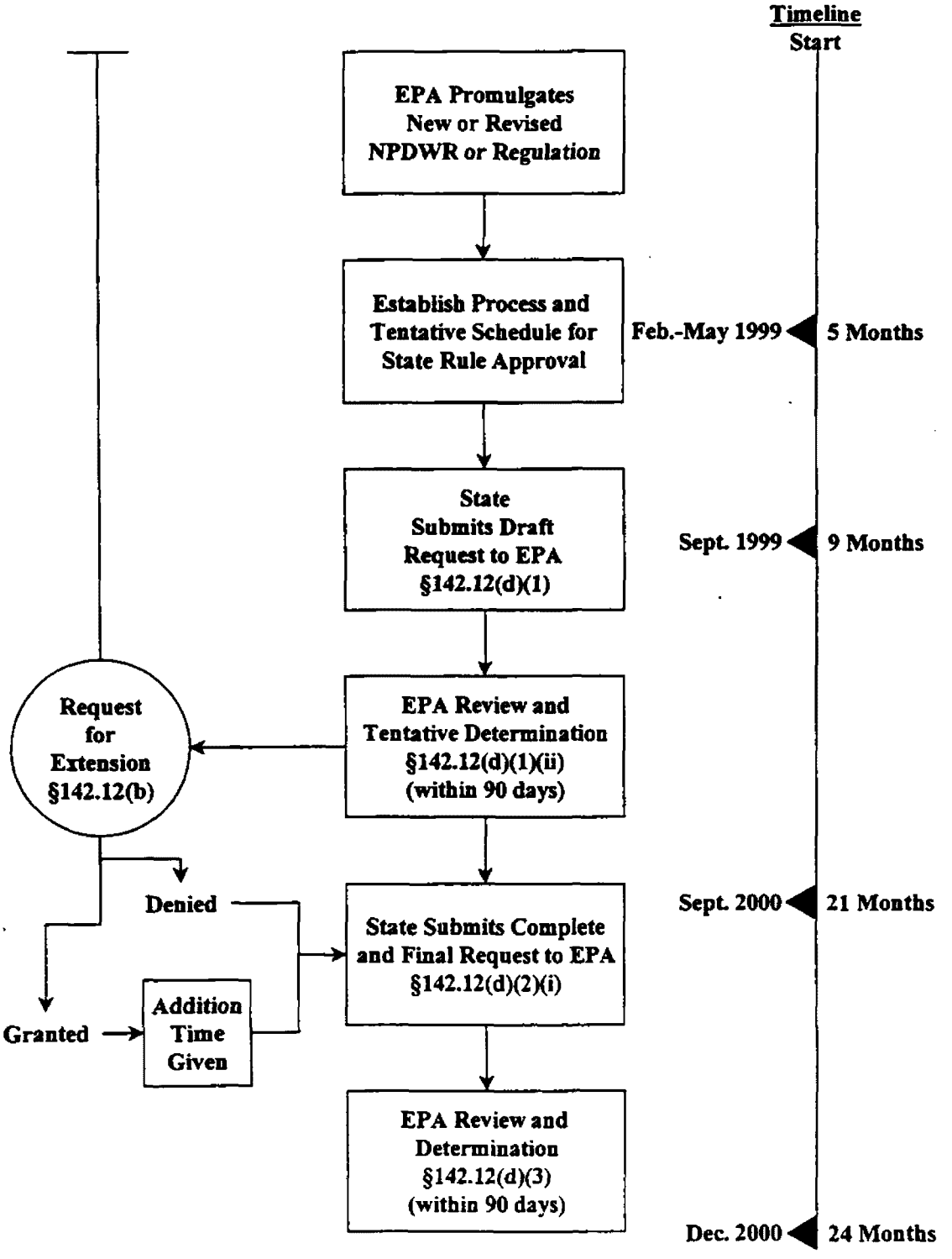
Draft Request—At the State's option, it may submit a draft request for EPA review and tentative determination. The request should contain drafts of all required primacy application materials. A draft request should be submitted by 9 months after rule promulgation. EPA will make a tentative determination 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. The State must also include its response to any comments and/or program deficiencies identified in the tentative determination (if applicable). 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 from 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.

Figure 4: Recommended Review Process for State Request for Approval of Program Revisions



B2. 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. Upon a satisfactory completion of the review, OGWDW will waive concurrence on all other State programs in that Region, although they will retain the option to review additional State programs with cause. OECA will continue to review the remaining packages due to audit law issues. 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, 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 to Bob Blanco in OGWDW, who 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. After the first package from each Region is approved, the Regions should forward remaining packages to Betsy Devlin in OECA.

C. State Primacy Program Revision Extensions

C1. 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.

C2. Criteria that an Extension Request Must Meet

For an extension to be granted, 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.

C3. 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 a MOU between the State and the EPA Regional office. Appendix D contains a sample MOU.

Conditions of an MOU may include:

- 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;

- Collecting, storing and managing laboratory results, public notices, and other compliance and operation data required by the EPA regulations;

- Assisting the Region in the development of the technical aspects of enforcement actions and conducting informal follow-up on violations (telephone calls, letters, etc.);

- Providing technical assistance to public water systems;

- 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;

- Providing the Region with all the information required under §142.15 on State reporting.

Figure 5 provides a checklist the Region can use to review State extensions.

Figure 5: 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)
___ Seeking Increases in Program Resources	_____
___ Training Existing Personnel/Revising Training Programs	_____
___ Revising State Regulations or Statutes	_____
___ Developing Revised/New Procedures, Guidelines, Policies	_____
___ 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

D. State Primacy Package

The Primacy Revision Application package should consist of the following sections:

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 Figure 6. In completing this checklist, the State must identify the program elements that it has revised in response to new Federal requirements. The State should indicate a "Yes" or "No" answer in the second column next to the list of program elements. During the application review process, EPA will insert findings and comments in the third column.

Figure 6: State Primacy Revision Checklist

Required Program Elements		Revision to State Program (Yes or No)	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(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 April 28, 1998

** New regulations published August 6, 1998

States may still receive primacy for the IESWTR and Stage I DBPR even if they have not yet revised their base program to comply with the new statutory requirements (PWS definition and administrative penalty authority) provided that the time to adopt these requirements (including the extension period if applicable) has not expired.

States may bundle the new PWS definition, administrative penalty authority, or variance and exemption requirements with the IESWTR and/or Stage I 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 must include the text of the State regulation/statute. The Attorney General statement should reference these new requirements.

Section II. Text of the State's Regulation

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

Section III. Primacy Revision Crosswalk

The Primacy Revision Crosswalk, found in Appendix C, 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."

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." The checklist for the IESWTR is presented in Figure 7, and the checklist for the Stage 1 DBPR is presented in Figure 8.

Figure 7: Reporting and Recordkeeping Checklist for the IESWTR

Requirement	Are State policies consistent with Federal requirements? If not, please explain.
Each State that has primary enforcement responsibility must keep records of turbidity measurements for not less than 1 year; information retained must be set forth in a form which makes possible comparison with turbidity limits specified in §§141.71, 141.73, 141.173, 141.175.	
Each State that has primary enforcement responsibility must keep records of disinfectant residual measurements and other parameters necessary to document disinfection effectiveness in accordance with §§141.72, 141.74, 141.75, 141.175; records must be kept for not less than 1 year.	
Each State that has primary enforcement responsibility must keep written records of decisions made on a system-by-system and case-by-case basis under the provisions of 40 CFR 141, subpart H or subpart P.	
Each State that has primary enforcement responsibility must keep records of systems consulting with the State concerning a modification to a disinfection practice under §141.172(c) including the status of the consultation.	
Each State that has primary enforcement responsibility must keep records of decisions that a system using alternative filtration technologies as allowed under §141.173(b) can consistently achieve 99% removal of *Cryptosporidium* oocysts; decisions must include State-set enforceable turbidity limits for each system; copy of the decision must be kept until the decision is reversed or revised; State must provide a copy of the decision to the system.	
Each State that has primary enforcement responsibility must keep records of systems required to do filter self-assessment, CPE, or CCP under the requirements of §141.175.	
Each State that has primary enforcement responsibility will keep a list of Subpart H systems that have had a sanitary survey completed during the previous year and an evaluation of the State's program for conducting sanitary surveys under §141.16(b)(3).	

Figure 8: 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.	
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)(6).	
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.	

Section V. Special Primacy Requirements (40 *CFR* 142.16)

See Section E. This section provides guidance on how States may choose to meet each Special Primacy Requirement.

Section VI. Attorney General's Statement of Enforceability

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. Similarly, if a State is not adopting the new PWS definition because it has no "constructed conveyance systems," the Attorney General should certify that the State statute or regulation is "as stringent as" the federal requirements and that any future constructed conveyance systems will be prohibited. An example of an Attorney General statement is presented in Figure 9.

Figure 9: 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 H) 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

E. 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 Interim Enhanced Surface Water Treatment Rule (IESWTR) and the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). The guidance addresses special primacy conditions in the same order that they occur in the rules. The IESWTR guidance is found in section E1. The Stage 1 DBPR guidance is found in E2. Guidance for provisions not included as special primacy requirements may be found in section E3.

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.

E1. Special Primacy Requirements—IESWTR

§142.16 Special primacy requirements. (b)(1)Enforceable requirements. (ii): *States must have the appropriate rules or other authority to assure PWSs respond in writing to significant deficiencies outlined in sanitary survey reports required under paragraph (b)(3) of this section no later than 45 days after receipt of report, indicating how and on what schedule the system will address significant deficiencies noted in the survey.*

Guidance

This special primacy requirement can be satisfied by a description of statutes, rules, and other authorities the State can use to assure PWSs take the necessary actions as outlined above. The appropriate section(s) of each source of authority must be cited and copies of the written documents must be included in the program revision application package.

In their applications, States may also wish to address their authority to take administrative and/or legal actions and assess penalties. Additionally, States may include a description of the plan for using their appropriate rules and/or other authority to achieve the desired actions on the part of PWSs. The plan could include the following:

- A cover letter that would be included with the sanitary survey report that lists each significant deficiency and provides notice to the system of the regulatory requirements. The cover letter would state the date by which the system's response would be required and explain that the response would have to indicate how and on what schedule the system plans to address each significant deficiency.
- Establishment of a "tickler" file to ensure State follow up.
- Follow-up actions for non-responding systems or systems that provide inadequate responses.

§142.16 Special primacy requirements. (b)(1) Enforceable requirements. (iii): *States must have the appropriate rules or other authority to assure that PWSs take necessary steps to address significant deficiencies identified in sanitary survey reports required under paragraph (b)(3) of this section, if such deficiencies are within the control of the PWS and its governing body.*

Guidance

This special primacy requirement can be satisfied by a description of statutes, rules, and other authority the State can use to assure PWSs take action necessary to address significant deficiencies. The appropriate section(s) of each source of authority must be cited and copies of the written documents must be included in the revision application package. EPA does not believe that the State's existing authority to address immanent and substantial endangerment is sufficient to meet this special primacy requirement.

In addition, States may wish to address their authority to take administrative and/or legal actions and assess penalties. Additionally, States may wish to include a description of how the appropriate rules and/or other authority, including formal enforcement actions, will be used to ensure that the PWSs take the steps necessary to correct significant deficiencies within their control.

EPA believes that many States have existing authorities that are adequate comply with the intent of this special primacy requirement. These authorities can often be found in broad statutory language designed to provide public health protection. An example of statutory language that, though not specifically worded to address this requirement, EPA judges to be adequate is:

§142.16 Special primacy requirements. (b)(3) Sanitary survey: *In addition to the general requirements for sanitary surveys contained in §142.10.(b)(2), an application must describe how the State will implement a sanitary survey program that meets the requirements in paragraphs (b)(3)(i) through (v) of this section. For the purposes of this paragraph, "sanitary survey" means an onsite review of the water source (identifying sources of contamination using results of source water assessments where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water.*

Guidance

The special primacy requirements of §142.16(b)(3) describe several additional provisions States must apply to their sanitary survey programs for systems using surface water or ground water under the direct influence of surface water as a source. These provisions address the aspects of PWSs that must be evaluated during the sanitary survey, minimum frequencies for conducting the sanitary surveys, review of disinfection profiles, and identification of "significant deficiencies" that require immediate corrective action. It also offers States the flexibility to allow some post-1995 sanitary surveys to serve as the first set required under the IESWTR; to reduce the frequency of sanitary surveys necessary for community surface water systems deemed by the State to have outstanding performance; and to conduct sanitary surveys in a phased or staged manner.

The following guidance addresses each subsection of §142.16(b)(3) (i) through (v) in order. The arrangement and structure of the State's description, however, is discretionary, provided the State gives sufficient detail to demonstrate that its strategy and capacity are adequate for meeting the special primacy conditions.

(i): The State must conduct sanitary surveys for all surface water systems(including groundwater under the influence) that address the eight sanitary survey components listed in paragraphs (b)(3)(i)(A)

through (H) of this section no less frequently than every three years for community systems and no less frequently than every five years for noncommunity systems. The State may allow sanitary surveys conducted after December 1995 to serve as the first set of required sanitary surveys if the surveys address the eight sanitary survey components listed in paragraphs (b)(3)(i)(A) through (H) of this section.

(A) Source.
(B) Treatment.
(C) Distribution system.
(D) Finished water storage.
(E) Pumps, pump facilities, and controls.
(F) Monitoring and reporting and data verification.
(G) System management and operation.
(H) Operator compliance with State requirements.

Guidance

This special primacy requirement addresses both the scope of the State's sanitary surveys (eight components must be included) and the minimum frequency for conducting surveys. Obviously, the implication is that States must have adequate resources to comply with these requirements. Therefore, components that States must address in their primacy revision application include the following.

Scope of sanitary surveys

The State must provide adequate information to demonstrate that the sanitary surveys to be performed address, at a minimum, the eight components listed above. In cases where the State is currently performing sanitary surveys that meet these minimum requirements, example sanitary survey forms and completed reports can be used to demonstrate that all eight elements are addressed. If the State does not believe that it currently performs sanitary surveys that meet the minimum requirements, the revision application must include details of a plan for upgrading its procedures, as necessary, including examples of sanitary survey forms that will be used and a description of training for staff in performance of sanitary surveys.

Capacity

The State's revision application should address capacity for conducting appropriate sanitary surveys at, or in excess of, the frequency outlined in §142.16(b)(3)(i). When such capacity exists and the above requirements are being met or exceeded by an existing program, a summary of the State's sanitary survey program, including a brief description of past and future schedules, should be sufficient to demonstrate adequate capacity.

A State that does not have an existing sanitary survey program that meets these requirements should describe its proposed program and estimate the resources directed toward sanitary surveys. The State should explain how the new requirements will affect its program and whether existing resources will be adequate. When existing resources are clearly inadequate, the State should provide EPA with a plan for obtaining additional support before the compliance dates of the rule.

Implementation

Finally, the State should provide EPA with a brief description of its plan for meeting the requirements of §142.16(b)(3)(i) given existing or planned resources, the number of affected surface water systems, anticipated follow-up technical assistance and enforcement needs, and other program demands.

(ii): For community systems determined by the State to have outstanding performance based on prior sanitary surveys, subsequent sanitary surveys may be conducted not less than every five years. In its primacy application, the State must describe how it will decide whether a system has outstanding performance and is thus eligible for sanitary surveys at a reduced frequency.

Guidance

This special primacy requirement allows the State to decrease the frequency of sanitary surveys for some community surface water systems from once every 3 years to once every 5 years. The provision is designed to allow States to direct their limited resources toward those systems that have the greatest potential for posing public health risks, *i.e.*, those *not* achieving outstanding performance. States must have a procedure for determining whether a system should be considered to have outstanding performance that must be integrated into the sanitary survey process. The procedure must provide inspectors with enough guidance to ensure consistent implementation.

Criteria States may use in determining outstanding performance can be found in Section 4.5 of *Conducting Sanitary Surveys of Public Water Systems Guidance Manual*, USEPA, 1999.
(iii): Components of a sanitary survey may be completed as part of a staged or phased state review process within the established frequency.

Guidance

Section 142.16(b)(3) requires States to conduct sanitary surveys for surface water systems including groundwater under the direct influence that address eight components. In view of the fact that States often have inspections and evaluations conducted on one or more of these PWS components in program efforts separate from the sanitary surveys, the rule allows for those evaluations and inspections to be used in a staged or phased review process as long as all eight components are addressed within the required frequency. For example, the annual onsite inspection required for unfiltered systems, as one criterion to remain unfiltered, can be used to supplement a full sanitary survey. Other programs whose activities may serve to address one or more of the components include the following:

- Source Water Assessment and Protection Program
- Wellhead Protection Area Program
- Watershed Control Program
- The Composite Correction Program
- Comprehensive Performance Evaluations
- Operator Training and Certification Programs
- Technical Assistance Programs
- Capacity Development Programs

If a State wishes to conduct sanitary surveys in a staged or phased process, the primacy revision application should contain a description of relevant programs and activities, how they will be coordinated, and who the responsible parties will be for follow-up technical assistance and enforcement in response to deficiencies.

(iv): When conducting sanitary surveys for systems required to comply with the disinfection profiling requirements in §141.172 of this chapter, the State must also review the disinfection profile as part of the sanitary survey.

Guidance

EPA suggests that States address this provision under the treatment component of the general description of their existing or planned sanitary survey programs. The description should include information on how the systems that are required to prepare disinfection profiles will be identified and tracked so inspectors will know when this review is needed and in what format the State will expect the data to be presented. Inspectors should know how the State will consult with PWSs to evaluate modifications to disinfection practices so these issues can be discussed during the sanitary survey (*see* §142.16(g)(2)).

References for more detailed guidance

1. *Disinfection Profiling and Benchmarking*, USEPA, 1999.
   Available from:
   Safe Drinking Water Hotline: 1-800-426-4791

2. *Guidance Manual for Compliance With the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources*, the American Water Works Association, 1991.
   Available from:
   AWWA
   6666 West Quincy Avenue
   Denver, CO 80235

(v): In its primacy application, the State must describe how it will decide whether a deficiency identified during a sanitary survey is significant for the purposes of paragraph (b)(1)(ii) of this section.

Guidance

During sanitary surveys inspectors often discover a wide range of deficiencies. Some are minor and have little near-term potential to pose risks to public health or safety. At the other end of the spectrum are those that are currently supplying drinking water that is unsafe or operating in a manner that threatens the safety of operators or the public. States must establish procedures for inspectors to use to determine the point where deficiencies become "significant."

Perhaps the first step in this process is to define "significant deficiencies." Many public health professionals believe that any aspect of a PWS (source, transmission, pumping, treatment, storage, distribution, operation, maintenance, management, etc.) that may cause, or have potential to cause, risks to public health or safety should be considered a significant deficiency. EPA does not specify the definition States must use; rather, it suggests that States use their best professional judgement and expertise to develop their own definitions. One potential definition that might be used is the following:

> **Significant deficiency:** *Any defect in a system's design, operation, maintenance, or administration, as well as any failure or malfunction of any system component, that the State determines to cause, or have the potential to cause, an unacceptable risk to health or that could affect the reliable delivery of safe drinking water.*

The second step may be for the State to develop a procedure whereby inspectors can evaluate system defects and make a determination regarding "significance," *i.e.*, does it meet the State definition?. The procedure might begin with questions to be asked about each defect. A few examples (*not intended to be complete*) of questions that may help inspectors in making determinations include the following:

- Does the deficiency cause the potential for contaminants to be introduced to the drinking water?
- If left uncorrected will the deficiency cause the potential for the introduction of contaminants at some point in the future?
- Does the deficiency affect treatment in an unacceptable manner?
- Does the deficiency pose risks to the safety of the public or operators?

Finally, it should be helpful for States to develop a list of the most commonly found deficiencies that are significant and that require immediate corrective actions. EPA would expect the list to be expanded and modified over time based upon State experience. The following are some examples, organized by each of the eight sanitary survey components, of system defects that States may consider to be significant and require immediate corrective action (also not intended to be complete).

Source

- Raw water quality monitoring that is indicative of an immediate sanitary risk.
- Activities or pollution sources in the immediate source water area that will cause sanitary risks.
- Location of a well making it vulnerable to surface water runoff.
- A well that is not properly sealed (details of what is expected should be offered regarding, sanitary seals, vents, grouting, etc.).
- Spring boxes that are poorly constructed and/or subject to flooding.

Treatment

- The disinfection contact time is inadequate.
- One or more of the unit processes is incapable of producing water that meets standards under all conditions of raw water quality.
- There are no provisions to warn operators of membrane failures.
- No disinfection profile is available for review (for systems required to develop a disinfection profile).

Distribution and transmission

- Customers are receiving, and using for drinking water, raw water from the raw water transmission main.
- The raw water transmission main is equipped with a bypass around the treatment plant and the bypass does not have an air gap to prevent unintended bypass of untreated water.
- Disinfection residuals in the distribution system regularly do not meet State requirements.
- Pressures in parts of the distribution system fall below 20 psi during peak flows.
- High leakage rates pose unacceptable risks of back siphonage.

Finished water storage

- The elevation of the storage facilities is such that pressures within the distribution system fall below 20 psi during peak demands.
- The tank is not adequately sealed to prevent entry of contamination (unscreened or poorly designed vents, overflows, hatches, etc.).
- The elevated tank has not been inspected for sanitary defects for *x* years.

Pumps, pump facilities, and controls

- The pumping station is used for storage of materials that offer unacceptable potential for contamination of the water.
- The pumping station is used for storage of materials that pose safety risks to operators.
- Cross connections are present.
- Auxiliary power is needed to keep pressures above 20 psi during commonly experienced power outages.

Monitoring, reporting and data verification

- The system has been found to be in significant non-compliance for one or more contaminants or for disinfectant residuals.
- Operators are using improper procedures and/or methods when conducting onsite lab analyses.
- The system is not using a certified laboratory.
- The system has been falsifying data

System management and operation

- The system has inadequate personnel to keep the plant manned as required by State regulations.
- The system has not developed a plan for provision of water during emergencies.

Operator compliance with State requirements

- The system has no certified operator.
- The system's certified operator is not complying with the State's continuing education requirements.

States should note that the above lists of significant deficiencies are provided in this guidance as examples of deficiencies that States may determine to be significant. The final determination of what constitutes a significant deficiency will be determined by each State on a case by case basis.

References for more detailed guidance

1. *Conducting Sanitary Surveys of Public Water Systems Guidance Manual*, USEPA, 1999.
   Available from:
   Safe Drinking Water Hotline: 1-800-426-4791

2. *How to Conduct a Sanitary Survey of Small Water Systems*, University of Florida Training, Research and Education for Environmental Occupations Center (developed under EPA Training Grant T902854), 1998.
   Available from:
   National Environmental Training Association
   2930 East Camelback Road, Suite 185
   Phoenix, AZ 85016-4412
   Phone: 602-956-6099

3. *State Sanitary Survey Resource Directory*, AKA *EPA/State Joint Guidance on Sanitary Surveys*, Association of State Drinking Water Administrators, 1995.
   Available from:
   Safe Drinking Water Hotline: 1-800-426-4791

4. *Guidance Manual for Compliance With the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources*, the American Water Works Association, 1991.

Available from:

AWWA
6666 West Quincy Avenue
Denver, CO 80235

§142.16 Special primacy requirements. (g): *Requirements for States to adopt 40 CFR part 141, subpart P Enhanced Filtration and Disinfection. In addition to the general primacy requirements enumerated elsewhere in this part, including the requirements that State provisions are no less stringent than the federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart P Enhanced Filtration and Disinfection, must contain the information specified in this paragraph: (1) Enforceable requirements: States must have the appropriate rules or other authority to require PWSs to conduct a Composite Correction Program (CCP) and to assure that PWSs implement any follow up recommendations that result as part of the CCP (See the rule for a description of the CCP components).*

Guidance

This special primacy requirement can be satisfied by a description of statutes, rules, and other authority (other than their immanent and substantial endangerment authority) the State can use to require PWSs to conduct a Composite Correction Program (CCP) and implement any follow up recommendations resulting from either a comprehensive performance evaluation (CPE) or comprehensive technical assistance (CTA). The appropriate section(s) of each source of authority should be cited and copies of the written documents must be included in the revision application package. The State should explain how the authorities will be used to require CCPs and ensure the resulting recommendations are implemented. States may also wish to address their authority to take administrative and/or legal actions and assess penalties.

Additionally, States should note that this requirement of the IESWTR is intended to ensure that States have authority to require comprehensive performance evaluations or comprehensive technical assistance in situations beyond those in which the IESWTR establishes the requirement for CPEs. Therefore, States may wish to consider other circumstances under which the requirement for performing a CPE or CTA might be desirable. States should consider development of prioritization procedures for targeting systems that need CPEs and should determine what performance-limiting factors (A, B, or C factors) must be corrected. To obtain the authority to ensure that systems conduct a CTA when necessary, States may want to add a requirement in their regulations that would require systems to go through with a CTA when the CPE required by the triggers in §141.175 of the rule show that a CTA would be beneficial.

Another consideration for States is that §141.175 of the IESWTR requires systems, under certain circumstances, to have a CPE conducted by the State or a third party approved by the State. If a State does not have adequate resources to conduct the expected CPEs, it may wish to begin development of a procedure for approving third parties that have the necessary expertise and meet other criteria established by the State.

References for more detailed guidance

1. *Optimizing Water Treatment Plant Performance Using the Composite Correction Program*, USEPA, Revised August 1998, EPA/625/6-91/027.

Available from:

Safe Drinking Water Hotline: 1-800-426-4791

2. *Optimizing Water Treatment Plant Performance Using the Composite Correction Program*, USEPA, February 1991, EPA/625/6-91/027.

Available from:

Safe Drinking Water Hotline: 1-800-426-4791

3. Summary Report: *Optimizing Water Treatment Plant Performance With the Composite Correction Program*, USEPA, 1990.

Available from:

Safe Drinking Water Hotline: 1-800-426-4791

§142.16 Special primacy requirements. (g): *Requirements for States to adopt 40 CFR part 141, subpart P Enhanced Filtration and Disinfection. In addition to the general primacy requirements enumerated elsewhere in this part, including the requirements that State provisions are no less stringent than the federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart P Enhanced Filtration and Disinfection, must contain the information specified in this paragraph: (2) State practices or procedures. (i): Section 141.172(a)(3) of this chapter—How the State will approve a more representative annual data set other than the data set determined under §141.172(a)(1) or (2) of this chapter for the purpose of determining applicability of the requirements of §141.172 of this chapter.*

Guidance

Section 141.172(a)(3) allows systems to request the State to approve their use of a more representative data set for determining if the system is required to develop a disinfection profile. Requests for approval to use a more representative data set may occur when a system has modified its treatment in a manner such that the data collected pursuant to §141.172(a)(1) or (2) no longer reflect the potential for production of disinfection byproducts. Use of a more representative data set would also be appropriate if the sampling, handling, and/or analysis of the data collected pursuant to §141.172(a)(1) or (2) were of questionable quality.

EPA believes that requests for use of alternative data sets are best handled by States on a case-by-case basis. Therefore, to meet this special primacy requirement, States' applications for program revision must demonstrate that each request for use of a more representative data set will be evaluated on its merits and approved only when a data set exists, or can be collected within the established time frame, that is more representative of the system's potential for production of disinfection byproducts.

References for more detailed guidance

1. *Disinfection Profiling and Benchmarking Guidance Manual*, USEPA, 1999.
   Available from:
   Safe Drinking Water Hotline: 1-800-426-4791

2. *Microbial and Disinfection Byproduct Rules Simultaneous Compliance Guidance Manual*, USEPA, 1999.
   Available from:
   Safe Drinking Water Hotline: 1-800-426-4791

§ 142.16 Special primacy requirements. (g): Requirements for States to adopt 40 CFR part 141, subpart P Enhanced Filtration and Disinfection. In addition to the general primacy requirements enumerated elsewhere in this part, including the requirements that State provisions are no less stringent than the federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart P Enhanced Filtration and Disinfection, must contain the information specified in this paragraph: (2) State practices or procedures. (ii): Section 141.172(b)(5) of this chapter—How the State will approve a method to calculate the logs of inactivation for viruses for a system that uses either chloramines or ozone for primary disinfection.

Guidance

Section 141.172(b)(5) of the IESWTR requires systems that use ozone or chloramines as primary disinfectants to calculate the logs of inactivation of viruses using a method approved by the State. This calculation is in addition to the calculation of the logs inactivation for *Giardia lamblia* and is required because, for these disinfectants, EPA expects greater CT will be necessary to achieve the necessary virus inactivation than will be necessary for inactivation of *Giardia lamblia*. In their primacy revision applications, States must describe how they will approve a method to calculate the logs of inactivation for viruses.

When determining virus inactivation, PWSs will be required to calculate the total CT from the point(s) of disinfectant application to the first customer. This procedure for determining CT for purposes of disinfection profiling under the IESWTR is outlined in §141.172(b) of the rule. It differs from that of the Surface Water Treatment Rule (SWTR) guidance that simply required a demonstration that minimum inactivation requirements were being met but that did not require a demonstration of the extent to which the requirements were exceeded.

After the PWS has determined its daily peak hour's CT, it must determine the logs of inactivation for viruses. EPA suggests that States, to the extent practicable, use the *Guidance Manual for Compliance With the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources* (SWTR Guidance Manual) for determining how systems should calculate the logs of inactivation of viruses, and thus meet this special primacy requirement. Suggested methods of doing so are as follows:

For systems using chloramines as a primary disinfectant

Table E-13 of the SWTR Guidance Manual presents CT values for 2 log, 3 log, and 4 log inactivation of viruses by chloramine at temperatures ranging from <1° C to 25° C. The table is appropriate for use by systems that add chlorine prior to ammonia and, therefore, get some benefit of a short-lived free chlorine residual. The basis for the inactivation values in Table E-13, is discussed in Appendix F (Section F.2.3 Chloramines) of the manual. Systems that add the two chemicals concurrently, or those adding ammonia first, have little free chlorine and cannot use Table E-13 but may determine viral inactivation efficiencies by using the protocol found in Appendix G of the manual.

For systems using ozone as a primary disinfectant

Table E-11 of the SWTR Guidance Manual shows CT values for 2 log, 3 log, and 4 log inactivation of viruses by ozone over a temperature range of <1° C to 25° C. EPA believes it to be appropriate for States to have PWSs use Table E-11 for calculating the logs of inactivation of viruses. Appendix F (F.2.4 Ozone) of the SWTR Guidance Manual offers a short discussion of the basis for the values in the table.

Other methods

States may approve other methods for calculation of the logs of inactivation for viruses for systems using ozone or chloramines as long as the methods are adequately explained in the primacy revision application, are technically correct, and are used in a consistent manner by water systems.

References for more detailed guidance

1. *Guidance Manual for Compliance With the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources*, the American Water Works Association, 1991.

Available from:

AWWA
6666 West Quincy Avenue
Denver, CO 80235

2. *Alternative Disinfectants and Oxidants Guidance Manual*, USEPA, 1999.

Available from:

Safe Drinking Water Hotline: 1-800-426-4791

§142.16 Special primacy requirements. (g): Requirements for States to adopt 40 CFR part 141, subpart P Enhanced Filtration and Disinfection. In addition to the general primacy requirements enumerated elsewhere in this part, including the requirements that State provisions are no less stringent than the federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart P Enhanced Filtration and Disinfection, must contain the information specified in this paragraph: (2) State practices or procedures. (iii): Section 141.172(c) of this chapter—How the State will consult with PWSs to evaluate modifications to disinfection practice.

Guidance

The IESWTR requires systems to develop a disinfection profile if they have concentrations of TTHM or HAA5 at or above 80 percent of the respective maximum contaminant levels. Systems that are required to develop disinfection profiles, and that later want to make a significant change to their disinfection practice, must consult with the State prior to making such change. As described in §141.172(c)(1) of the IESWTR, significant changes include:

- Moving the point of disinfectant application.
- Changing the disinfectant(s).
- Changing the disinfection process.
- Other changes identified by the State as significant (examples may include changes in pH, source water, pretreatment, or contact basin geometry and baffling).

This requirement of the IESWTR is intended to ensure that systems attempting to reduce disinfection byproduct production do not make changes that cause unintended and unacceptable increases in microbial risks. In order for §141.172(c)(1) of the IESWTR to be effective, States must identify all systems that are required to develop a disinfection profile and provide them with guidance in terms of when, and under what circumstances, consultation is necessary. It should be noted that the IESWTR requires "consultation" with the State but does not prescribe the outcome of the consultation.

In their applications for program revision, States must explain how they will consult with systems to evaluate changes in disinfection practices. EPA suggests that States, in the consultation process, consider the following:[1]

- Why the change is being proposed.
- The positive impacts of the change.
- The negative impacts of the change.
- The alternative benchmark.
- Are there alternatives that achieve the desired goal and, if so, have they been evaluated?

Finally, the State should work with the PWS in an effort to reach a conclusion that considers, weighs, and balances the risks of microbial contaminants and disinfection byproducts. Ultimately, the State and system should jointly make a public-health-based decision using all available information.

[1] More detailed guidance and strategies for simultaneous achievement of acute and chronic public health protection are addressed in the two listed EPA references.

References for more detailed guidance

1. *Disinfection Profiling and Benchmarking Guidance Manual*, USEPA, 1999.
   Available from:
   Safe Drinking Water Hotline: 1-800-426-4791

2. *Microbial and Disinfection Byproduct Rules Simultaneous Compliance Guidance Manual*, USEPA, 1999.
   Available from:
   Safe Drinking Water Hotline: 1-800-426-4791

§142.16 Special primacy requirements. (g): Requirements for States to adopt 40 CFR part 141, subpart P Enhanced Filtration and Disinfection. In addition to the general primacy requirements enumerated elsewhere in this part, including the requirements that State provisions are no less stringent than the federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart P Enhanced Filtration and Disinfection, must contain the information specified in this paragraph (2) State practices or procedures. (iv): Section 141.173(b) of this chapter—For filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, how the State will determine that a public water system may use a filtration technology if the PWS demonstrates to the State, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of §141.172(b) of this chapter, consistently achieves 99.9 percent removal and/or inactivation of Giardia lamblia *cysts and 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of* Cryptosporidium *oocysts. For a system that makes this demonstration, how the State will set turbidity performance requirements that the system must meet 95% of the time and that the system may not exceed at any time at a level that consistently achieves 99.9 percent removal and/or inactivation of* Giardia lamblia *cysts, 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of* Cryptosporidium *oocysts.*

Guidance

The SWTR and IESWTR establish performance standards for several long-established types of surface water treatment technologies, including conventional treatment, direct filtration, slow sand filtration, and diatomaceous earth filtration. These technologies, when properly designed and operated, used in conjunction with disinfection and contact time, and applied to appropriate surface waters, are capable of protecting against the health risks associated with *Giardia lamblia*, *Legionella*, viruses, *Cryptosporidium*, and other pathogens. Section 141.173(b) of the IESWTR allows PWSs to use technologies other than those mentioned above if they demonstrate to the State's satisfaction that the chosen technology consistently meets the rule's minimum removal and inactivation requirements, and the State approves the use of the technology. When the State grants approval for the use of alternative technologies, it must establish a turbidity performance limit the system must meet at least 95 percent of the time and a turbidity limit the system may not exceed at any time. The State must set the turbidity limits at levels that ensure the removal and/or inactivation requirements are consistently achieved.

To qualify for the authority to use the discretion provided for by §141.173(b) of the IESWTR, States must, in their primacy revision application, describe how they will determine whether a PWS will or will not be granted approval for use of an alternative technology *and* how the State will establish the requisite turbidity performance standards.

Most States have a review and approval process that addresses all significant modifications to PWSs (not just alternative technologies). In their review of treatment technologies, States generally consider all relevant components necessary to provide consistently safe drinking water including raw water quality and its variability, pretreatment needs, design flow rates, disinfection, storage, monitoring, and operation and maintenance requirements. Because alternative technologies generally do not have long performance histories to base approval/permitting decisions upon, States may wish to apply an additional margin of scrutiny in their review process. The technologies should be evaluated not only on the basis of finished water quality, but also with consideration of operational complexities, the potential for cross connections, redundancy, the ability to handle variable raw water qualities, leaching of contaminants, and long term reliability. Pilot studies are often necessary to adequately demonstrate that an alternative technology is appropriate for use at a particular site.

Guidance has been developed for States to use in determining how to grant approvals for alternative technologies. This guidance generally does not address the current concern for *Cryptosporidium*. The protocols that have been developed and used to assess the performance of technologies in terms of *Giardia lamblia* removal may, however, be revised for *Cryptosporidium* removal evaluations. EPA recommends that States consider the guidance on these issues presented in Section 4.3.7 and Appendix M of the SWTR Guidance Manual (reference 3) as well as the Western States Workgroup's *Consensus Protocol for Evaluation and Acceptance of Alternate Surface Water Filtration Technologies in Small System Applications*, 1992 (reference 1). The protocol developed by the Western States Workgroup establishes a procedure and criteria for evaluation of alternative filtration technologies and should be particularly useful. The following is an outline of the protocol's procedural steps.

1) System component evaluation for leaching of contaminants.
2) Demonstration of *Giardia* (and *Cryptosporidium*) removal performance.
   a. Microscopic Particulate Analyses (MPA).
   b. *Giardia/Cryptosporidium* surrogate particle removal evaluations.
   c. Particle size analysis demonstration for *Giardia* (and *Cryptosporidium*) removal credit.
   d. Live *Giardia/Cryptosporidium* challenge studies.
3) On-site demonstration of performance effectiveness.
   a. Prior testing of an identical system on a similar water.
   b. Conditional acceptance with a performance bond.
   c. Pilot testing with MPAs, appropriate monitoring, and final engineering report.

The final step in the process is for States to establish turbidity limits for the technologies. This was not necessary under the SWTR's requirements because the limits for alternative technologies defaulted to the performance limits established for slow sand filtration. When establishing the performance limits, States should give consideration to, among other things, cyst removal efficiencies, potential for interference with disinfection, potential for interference with bacteriological testing, and the technology (failure indicators) redundant components.

References for more detailed guidance

1. *Consensus Protocol for Evaluation and Acceptance of Alternate Surface Water Filtration Technologies in Small System Applications*, Western States Workgroup, April 1992.
Available from:
Safe Drinking Water Hotline: 1-800-426-4791

2. *State Alternative Technology Approval Protocol*, ASDWA/EPA.
Available from:
Safe Drinking Water Hotline: 1-800-426-4791

3. *Guidance Manual for Compliance With the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources*, AWWA, 1991.
Available from:
AWWA
6666 West Quincy Avenue
Denver, CO 80235

E2. Special Primacy Requirements—Stage 1 DBPR

§142.16 Special primacy requirements (h): Requirements for States to adopt 40 CFR part 141, subpart L. In addition to the general primacy requirements elsewhere in this part,.including the requirement that State regulations be at least as stringent as federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart L, must contain a description of how the State will accomplish the following program requirements: (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.

☞ **Note:** Congress, in the 1996 Amendments to the Safe Drinking Water Act (SDWA), amended Section 1412(b)(10) to provide States with the discretion to allow up to 2 additional years to comply with an MCL or treatment technique if the State determines that additional time is necessary for capital improvements. States may, if they choose, address this special primacy condition by stating in their applications for program revision that extensions will be handled under the provisions of §1412(b)(10) of the SDWA. Guidance is offered below for those States that wish to use it.

Guidance

For the purpose of compliance with the MCLs for disinfection byproducts, §141.64(b)(2) of the Stage 1 DBPR allows systems to apply to the State for an extension of up to 24 months (but not beyond 60 months after rule publication) if they are installing GAC or membrane technology. For practical purposes this provision only applies to subpart H systems[2] that serve 10,000 or more people, since all other affected systems have up to 60 months to comply. The rule requires States to establish a compliance schedule when granting extensions. States may also specify interim treatment measures the system must take. The provision for interim treatment requirements is intended to give States the opportunity to ensure that public health protection is maximized, within the constraints of the system's existing configuration, while GAC or membrane technology is being installed.

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 any interim treatment requirements they may choose to mandate. Some possibilities that States may wish to consider include the following:

- Moving the point of disinfectant application.
- Treatment changes designed for better disinfection byproduct precursor removal.
- Changing of primary and/or secondary disinfectants.
- Reducing the disinfectant(s) dose (perhaps with increases in water temperature).
- Changing pH to reduce DBP formation.
- Addition of booster disinfection.
- Implementation of a main flushing program in areas with high detention times and/or biofilm problems.

In all cases, EPA believes that it is essential for States to 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. Finally, interim treatment requirements that are established must result in a net gain in public-health protection. Detailed guidance and case studies

[2] Subpart H systems are those systems that use surface water or ground water under the direct influence of surface water.

are presented in *Microbial and Disinfection Byproduct Rules Simultaneous Compliance Guidance Manual*, USEPA, Draft guidance available for review 1999.

References for more detailed guidance

1. *Microbial and Disinfection Byproduct Rules Simultaneous Compliance Guidance Manual*, USEPA, 1999.

Available from:

Safe Drinking Water Hotline: 1-800-426-4791

2. *Alternative Disinfectants and Oxidants Guidance Manual*, USEPA, 1999.

Available from:

Safe Drinking Water Hotline: 1-800-426-4791

3. *Treatment Techniques for Controlling Trihalomethanes in Drinking Water*, AWWA, 1982.

4. *Chloramination for THM Control: Principles and Practices*, AWWA Seminar Proceedings, 1984 Annual Conference.

References 3. and 4. available from:

AWWA
6666 West Quincy Avenue
Denver, CO 80235

§142.16 Special primacy requirements. (h): *Requirements for States to adopt 40 CFR part 141, subpart L. In addition to the general primacy requirements elsewhere in this part, including the requirement that State regulations be at least as stringent as federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart L, must contain a description of how the State will accomplish the following program requirements: (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

The rule requires that each community water system (CWS) and nontransient noncommunity water system (NTNCWS) regulated under the Stage 1 DBPR be operated by qualified personnel. States are given the discretion of determining the standards for operator qualifications. Under 40 CFR part 141, subpart H—Filtration and Disinfection, States are required to qualify operators of systems as a condition for primacy for systems covered under the SWTR. The new rule 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. 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 to demonstrate the procedure is appropriate and applicable.

Additionally, under section 1419 of the SDWA, EPA is required to develop guidelines for the certification and re-certification of operators of community and nontransient noncommunity water systems. 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. In cooperation with States, final guidelines were developed and published in the Federal Register on February 5, 1998. EPA is required to publish final guidelines by February 6, 1999. State operator certification programs that follow these guidelines will also be deemed to meet this special primacy requirement.

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. 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. Operators should have an understanding of the following areas.

- The principles of water treatment and distribution and their characteristics.
- The uses of potable water and variations in its demand.
- The importance of water quality to public health.
- The equipment, operation, and maintenance of the distribution system.
- The treatment process equipment used, its operational parameters, and maintenance.
- The principles of each unit.
- Performance criteria to determine operational adjustment.
- Common operating problems.
- Current regulations and monitoring requirements.
- Methods of sample collection and sample preservation.
- Laboratory equipment and tests used to analyze samples.

- Use of laboratory results to analyze plant efficiency.
- Recordkeeping.
- Customer relations.
- 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*, the American Water Works Association, 1991

Available from:

AWWA
6666 West Quincy Avenue
Denver, CO 80235

2. *Operator Certification Guidance*, 64 FR 5915, February 5, 1999.

§142.16 Special primacy requirements. (h): Requirements for States to adopt 40 CFR part 141, subpart L. In addition to the general primacy requirements elsewhere in this part, including the requirement that State regulations be at least as stringent as federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart L, must contain a description of how the State will accomplish the following program requirements: (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 will need to establish procedures that systems must follow for making dilutions of water samples that contain chlorine concentrations too high to be directly read on the color wheel.**

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): Requirements for States to adopt 40 CFR part 141, subpart L. In addition to the general primacy requirements elsewhere in this part, including the requirement that State regulations be at least as stringent as federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart L, must contain a description of how the State will accomplish the following program requirements: (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, and alkalinity 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. To meet this special primacy requirement, States must describe how they will approve parties to conduct these measurements. The process described by the State must ensure that the measurements are reliable and accurate. To achieve this, the tests must 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): *Requirements for States to adopt 40 CFR part 141, subpart L. In addition to the general primacy requirements elsewhere in this part, including the requirement that State regulations be at least as stringent as federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart L, must contain a description of how the State will accomplish the following program requirements: (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 and the finished water quality characteristics of all wells are 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 §142.16(f)(5) to submit an evaluation or study performed by a professional competent in the field of hydrogeology such as a geologist, hydrogeologist, or professional engineer.[3] 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

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

Water characteristics and chemistry

- pH (field).
- Temperature (field).
- Specific conductivity.
- Total organic carbon (TOC).
- 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.

[3] Often relevant information can be obtained from the USGS, State geological surveys, or State bureaus of mines and geology.

§142.16 Special primacy requirements. (h): *Requirements for States to adopt 40 CFR part 141, subpart L. In addition to the general primacy requirements elsewhere in this part, including the requirement that State regulations be at least as stringent as federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart L, must contain a description of how the State will accomplish the following program requirements: (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.

In determining their compliance options, systems should first look to the alternative compliance criteria of §141.135(a)(2) or (a)(3) to see if one or more of them can be met at all times. If no alternative compliance criterion can be met, systems must begin a 2-step process to achieve compliance.

Step 1—The first step is to operate their conventional treatment plants in a mode that ensures compliance with the applicable Step 1 minimum TOC removal requirements as presented in the table found in §141.135(b)(2). When systems are unable to meet the Step 1 TOC removal requirements, they must go to Step 2.

Step 2—Systems unable to meet the Step 1 removal requirements 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 be handled on a case-by-case basis and will maximize TOC removal to the extent practicable and, thus, be protective of public health.

References for more detailed guidance

1. *Enhanced Coagulation and Enhanced Softening*, USEPA, 1999.
   Available from:
   Safe Drinking Water Hotline: 1-800-426-4791

E3. 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 §141.134[4]. 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 all 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 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:

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

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

[4] §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.

- Schematic drawings of all treatment facilities, including—
  - Source(s)
  - Identification of treatment type and purpose
  - Identification of chemicals applied and points of application
  - Each unit process of each treatment train (with flow rates)
  - Sampling points identified and numbered *(e.g.* T-1, T-2)

- A schematic drawing of the distribution system (and consecutive systems), including—
  - Sources
  - Entry points
  - Treatment facilities
  - Storage facilities
  - Sampling points identified and numbered (*e.g.* D-1, D-2)

- 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 times[5] are expected to occur, etc.

- 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).

- The plan must also distinguish between compliance samples and those taken for process control and/or information.

- For conventional surface water treatment plants, a summary of the system's enhanced coagulation/softening requirements.

- 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*, EPA 814-B-96-001, April 1996
   Available from:
   Safe Drinking Water Hotline: 1-800-426-4791

2. *ICR Water Utility Database System Users' Guide*, EPA 814-B-96-004, April 1996.
   Available from:
   Safe Drinking Water Hotline: 1-800-426-4791

[5] 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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The following materials are intended to help States and PWSs comply with the Interim Enhanced Surface Water Treatment Rule (IESWTR) and the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). These materials are designed to be "stand-alone" resources that meet specific informational needs.

Technical Information Available on the IESWTR and Stage 1 DBPR

Eight guidance manuals published by EPA.

- ✓ *Disinfection Benchmarking Guidance Manual*
- ✓ *Turbidity Guidance Manual*
- ✓ *Alternative Disinfectants and Oxidants Guidance Manual*
- ✓ *Guidance Manual for Conducting Sanitary Surveys of Public Water Systems*
- ✓ *Unfiltered Systems Guidance Manual*
- ✓ *Uncovered Finished Water Reservoirs Manual*
- ✓ *M-DBP Simultaneous Compliance Manual*
- ✓ *Guidance Manual for Enhanced Coagulation and Precipitative Softening*

EPA Fact Sheets

Highlights of these rules and the microbial-disinfectants/disinfection byproducts rulemaking process.

- ✓ *Drinking Water Priority Rulemaking: Microbial and Disinfection Byproduct Rules*
- ✓ *Interim Enhanced Surface Water Treatment Rule*
- ✓ *Stage 1 Disinfectants and Disinfection Byproducts Rule*
- ✓ *Disinfection Profiling and Benchmarking*

M/DBP Q&A

Answers to frequently asked questions about these rules. The EPA web page will continually update this section (see http://www.epa.gov/safewater/mdbp/implement/html).

Spreadsheets

An electronic spreadsheet to assist PWSs performing disinfection profiles will be available on the EPA web site (see http://www.epa.gov/safewater/mdbp/implement/html).

List of Labs Approved to Perform Analysis for the ICR

For an updated list, please refer to the Safe Drinking Water Hotline (1.800.426.4791) or the EPA web site (www.epa.gov/ogwdw/lablist/lname.html).

Rule Presentations

Presentations that can be used for workshops for both the IESWTR and the Stage 1 DBPR are available in Power Point format on the Drinking Water Academy web site (*See* http://www.epa.gov/safewater/dwa.html). Hard copies of these may be found in Appendix J of this Guidance.

A. Technical Information Available on the IESWTR and Stage 1 DBPR

A series of guidance manuals will support the IESWTR and Stage 1 DBPR. The manuals will aid EPA, State agencies, and affected PWSs in implementing the two inter-related rules and will help ensure that implementation among these groups is consistent. As these manuals become available, they may be found on the EPA web site at http://www.epa.gov/safewater/mdbp/implement/html.

EPA made these manuals available for public review in early 1999, and is revising them based on the comments received. Summaries of the information included in the manuals are provided below.

Disinfection Benchmarking Guidance Manual

Objective: Help determine if a disinfection profile (an evaluation of current disinfection practices) is required and how to do one; when a disinfection benchmark must be determined and how to extract it from the profile, and; how a PWS must use the benchmark, in consultation with the State, to assure protection from microbial risk is maintained when the system changes its disinfection practice.

Contents: The manual provides detailed information on the following subjects: applicability of the profiling and benchmarking requirements to public water systems; procedures for generating a disinfection profile, including example profiles; methods for calculating the disinfection benchmark, including example calculations; the use of the benchmark in modifying disinfection practices, communication with the State, and assessing significant changes to disinfection practices; the development of the profiling and benchmarking regulations; the significance of the log inactivation concept and CT values for inactivations achieved by various disinfectants; and the determination of contact time.

Turbidity Guidance Manual

Objective: The first section provides information regarding specific requirements of the IESWTR relating to turbidity and is intended for experienced operators and others in the regulated community. The second section of the document provides background on concepts surrounding turbidity and serves as a primer for less experienced operators and individuals.

Contents: The first section contains key regulatory requirements, including combined filter effluent monitoring and individual filter monitoring; recordkeeping and reporting requirements; additional compliance issues, such as compliance schedules, public notification, variances/exemptions, and follow-up action requirements; approved methods and additional methods and additional measurement and calibration issues; components and description of a filter self-assessment, and; components and description of a Comprehensive Performance Evaluation. The second section of the manual includes more basic information on turbidity; description of the particles (both natural and man-made) that typically contribute to turbidity; discussion of typical steps in a treatment process and how turbidity is removed or created in each step; discussion of turbidity in different source waters with an emphasis of how changes in source water affect turbidity, and; basic turbidimeter design.

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, 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.

Guidance Manual for Conducting Sanitary Surveys of Public Water Systems

Objective: Provides an overview of how to conduct a sanitary survey of all water systems using surface water and ground water under the direct influence of surface water. It is intended to help State agencies improve their sanitary survey programs where needed.

Contents: The manual provides information about the objective and regulatory context of sanitary surveys. It covers four principal stages of a sanitary survey: planning, including preparatory steps to be taken by inspectors before conducting the on-site portion; conducting the on-site survey; compiling a sanitary survey report, and; preforming follow-up activities.

Unfiltered Systems Guidance Manual

Objective: To supplement the existing IESWTR guidance for unfiltered surface water suppliers and to identify the issues and requirements associated with the new regulations.

Contents: The manual discusses provision of the IESWTR that will affect unfiltered surface water, and provides guidance on the development of watershed control programs or enhancements of existing watershed control programs to address *Cryptosporidium*. In addition, it provides information and guidance on monitoring for *Cryptosporidium*.

Uncovered Finished Water Reservoirs Manual

Contents: Provides detailed information on the following subjects: developing and implementing comprehensive open finished water reservoir management plans based on ste-specific conditions; identifying potential sources of contamination in open finished water reservoirs and potential mitigation measures; employing different methods to control the degradation of water quality while it resides in the reservoir; monitoring schemes that can be used to characterize water quality and identify water quality degradation before it becomes severe and difficult to correct.

M-DBP Simultaneous Compliance Manual

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.

Guidance Manual for Enhanced Coagulation and Precipitative Softening

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.

For more information on this series of guidance manuals, contact EPA's Safe Drinking Water Hotline: 1.800.426.4791, or see the Office of Ground Water and Drinking Water website at www.epa.gov/safewater/standards.html

B. 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 as States go through the adoption process.

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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. The new Stage 1 Disinfectants and Disinfection Byproduct Rule and Interim Enhanced Surface Water Treatment Rule are the first of a set of rules under the Amendments.

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 815-F-98-009) and the Stage 1 Disinfectants and Disinfection Byproducts Rule (EPA 815-F-98-010).

Schedule of M-DBP Rules

November 1998—Final Rule	Interim Enhanced Surface Water Treatment Rule and Stage 1 Disinfectants and Disinfection Byproducts Rule
August 2000—Final Rule	Filter Backwash Recycling Rule
November 2000—Final Rule	Long Term 1 Enhanced Surface Water Treatment Rule and 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.

EPA's Science Advisory Board concluded in 1990 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.

In addition, while disinfectants are effective in controlling many microorganisms, they react with natural organic and inorganic matter in source water and distribution systems to form potentially 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

- Microbial Contaminants: 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. The Total Coliform Rule, revised in 1989, applies to all PWSs and establishes a maximum contaminant level (MCL) for total coliforms.

- Disinfection Byproducts: 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

To support the M-DBP rulemaking process, the Information Collection Rule (61 FR 24354, May 14, 1996) establishes monitoring and data reporting requirements for large public water systems serving at least 100,000 people. This rule is intended to provide EPA with information on the occurrence in drinking water of microbial pathogens and DBPs. In addition, EPA is collecting engineering data on how PWSs currently control such contaminants as part of the Information Collection Rule.

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

EPA finalized the Interim Enhanced Surface Water Treatment Rule and Stage 1 Disinfectants and Disinfection Byproducts Rule in November 1998, as required by the 1996 Amendments to the Safe Drinking Water Act, Section 1412(b)(2)(C). 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 reservoirs; and,
- 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, 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 four trihalomethanes (chloroform (zero), 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 - a sum of the four listed above (0.080 mg/L). 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)); and,
- 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. A Long Term 1 Enhanced Surface Water Treatment Rule, due in the fall of 2000, 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. The Agency is considering what modifications of some large system requirements may be appropriate for small systems.

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 will begin discussions with stakeholders in December 1998 on the direction for these rules. EPA anticipates proposed rules in early 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 developing a 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. The Ground Water Rule will be promulgated November 2000.

Filter Backwash Recycling

The 1996 SDWA Amendments require that EPA set a standard on recycling filter backwash within the treatment process of public water systems by August 2000. The regulation will apply to all public water systems, regardless of size. EPA is currently gathering data, reviewing literature, and consulting with industry representatives, members of the environmental community, and consulting engineers to identify engineering and cost issues that are salient to regulatory development.

Opportunities for Public Involvement

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 rule 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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EPA Interim Enhanced Surface Water Treatment Rule

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 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.

In the past ten years, however, we have learned that there are specific microbial pathogens, such as *Cryptosporidium*, that are 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.

Amendments to SDWA in 1996 require EPA to develop rules to balance the risks. It is important to strengthen protection against microbial contaminants, especially *Cryptosporidium*, and at the same time, reduce potential health risks from disinfection byproducts. The new Interim Enhanced Surface Water Treatment Rule and Stage 1 Disinfectants and Disinfection Byproducts Rule are the first of a set of rules under the Amendments. This fact sheet focuses on the Interim Enhanced Surface Water Treatment Rule. A separate fact sheet focuses on the Stage 1 Disinfectants and Disinfection Byproducts Rule (EPA 815-F-98-010).

PUBLIC HEALTH CONCERNS FROM MICROBIAL CONTAMINANTS IN DRINKING WATER

EPA's Science Advisory Board concluded in 1990 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.

WHO MUST COMPLY WITH THE RULE?

The Interim Enhanced Surface Water Treatment Rule applies to public water systems that use surface water or ground water under the direct influence of surface water (GWUDI) and serve at

least 10,000 people. In addition, States are required to conduct sanitary surveys for all surface water and GWUDI systems, including those that serve fewer than 10,000 people.

WHAT DOES THE RULE REQUIRE?

The Interim Enhanced Surface Water Treatment Rule amends the existing Surface Water Treatment Rule to strengthen microbial protection, including provisions specifically to address *Cryptosporidium*, and to address risk trade-offs with disinfection byproducts. The final rule includes treatment requirements for waterborne pathogens, e.g., *Cryptosporidium*. In addition, systems must continue to meet existing requirements for *Giardia lamblia* and viruses. Specifically, the rule includes:

- 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 reservoirs; and,
- Sanitary surveys, conducted by States, for all surface water systems regardless of size.

The rule, with tightened turbidity performance criteria and individual filter monitoring requirements, is designed to optimize treatment reliability and to enhance physical removal efficiencies to minimize the *Cryptosporidium* levels in finished water. Turbidity requirements for combined filter effluent will remain at least every four hours, but continuous monitoring will be required for individual filters. In addition, the rule includes disinfection profiling and benchmarking provisions to assure continued levels of microbial protection while facilities take the necessary steps to comply with new DBP standards.

WHAT ARE THE COMPLIANCE DEADLINES?

States have 2 years from publication to adopt and implement the requirements of this regulation. Simultaneous compliance with the Stage 1 Disinfectants and Disinfection Byproduct Rule, promulgated at the same time, will be achieved as follows:

Public water systems that use surface water or ground water under the direct influence of surface water, either in whole or in part, and serve a population of 10,000 or more generally have 3 years from Federal promulgation to comply with requirements of this rule, *except for disinfection profiling and benchmarking, which require systems to begin sampling after 3 months*. In cases

where capital improvements are needed to comply with the rule, States may grant systems up to an additional 2 years to comply.

WHAT ARE THE COSTS AND BENEFITS OF THE RULE?

EPA estimates that implementation of the Interim Enhanced Surface Water Treatment Rule will:

- Improve public health by increasing the level of protection from exposure to *Cryptosporidium* and other pathogens (i.e., *Giardia*, or other waterborne bacterial or viral pathogens) in drinking water supplies through improvements in filtration at water systems;
- Significantly reduce the level of *Cryptosporidium* in finished drinking water supplies through improvements in filtration at water systems (i.e., revised turbidity requirements);
- Decrease the likelihood of endemic (constant low-level presence of a disease or infection) illness from *Cryptosporidium* by 110,000 to 463,000 cases annually and related health costs, as well as incidences of illness from *Giardia* and other waterborne pathogens; and,
- Reduce the likelihood of the occurrence of outbreaks of cryptosporidiosis (illness from *Cryptosporidium)* and their associated economic costs by providing a larger margin of safety against such outbreaks for some systems.

The total annualized national cost for implementing the Interim Enhanced Surface Water Treatment Rule is $307 million. EPA believes that the benefits exceed the costs. The rule will result in increased costs to public water systems for improved turbidity treatment, monitoring, disinfection benchmarking and covering new finished water reservoirs, as well as State implementation costs.

EPA estimates that 92 percent of households will incur an increase in their water bill of less than $1 per month; 7 percent of households will incur an increase in their water bills of between $1 - $5 per month; and less than 1 percent will incur an increase of between $5-8 per month.

WHAT TECHNICAL INFORMATION WILL BE AVAILABLE ON THE RULE?

A series of guidance manuals is planned to support the Interim Enhanced Surface Water Treatment Rule and the Stage 1 Disinfectants/Disinfection Byproducts Rule. The manuals will aid EPA, State agencies and affected public water systems in implementing the two interrelated rules, and will help to ensure that implementation among these groups is consistent. EPA anticipates that the manuals will be available for review in early 1999.

The manuals will include:

Disinfection Benchmarking Guidance Manual

Objective: To help determine if a disinfection profile (an evaluation of current disinfection practice) is required and how to do one; when a disinfection benchmark must be determined and how to extract it from the profile; and how a public water system must use the benchmark, in

consultation with the State, to assure protection from microbial risk is maintained when the system changes disinfection practice.

Contents: The manual provides detailed information on the following subjects: applicability of the profiling and benchmarking requirements to public water systems; procedures for generating a disinfection profile, including example profiles; methods for calculating the disinfection benchmark, including example calculations; the use of the benchmark in modifying disinfection practices, communicating with the state, and assessing significant changes to disinfection practices; the development of the profiling and benchmarking regulations; the significance of the log inactivation concept and CT values for inactivations achieved by various disinfectants; and the determination of contact time.

Turbidity Guidance Manual

Objective: The first section provides technical information regarding specific requirements of the Interim Enhanced Surface Water Treatment Rule relating to turbidity and is intended for experienced operators and others in the regulated community. The second section of the document provides background on concepts surrounding turbidity and serves as a primer for less experienced operators and individuals.

Contents: The first section contains key regulatory requirements including combined filter effluent monitoring and individual filter monitoring; recordkeeping and reporting requirements; additional compliance issues such as compliance schedule, public notification, variances/exemptions, and follow-up action requirements; approved methods and additional measurement and calibration issues; components and description of an filter self-assessment; and components and description of a Comprehensive Performance Evaluation. The second section of the manual includes more basic information on turbidity; description of the particles (both natural and man-made) which typically contribute to turbidity; discussion of typical steps in a treatment process and how turbidity is removed or created in each step; discussion of turbidity in different source waters with an emphasis of how changes in source water effect turbidity; and basic turbidimeter design.

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.

Guidance Manual for Conducting Sanitary Surveys of Public Water Systems

Objective: The guidance manual provides an overview of how to conduct a sanitary survey of all water systems using surface water and ground water under the direct influence of surface water. It is intended to help state agencies improve their sanitary survey programs where needed.

Contents: The manual provides information about the objective and regulatory context of sanitary surveys. It covers four principal stages of a sanitary survey: planning, including preparatory steps to be taken by inspectors before conducting the onsite portion; conducting the onsite survey; compiling a sanitary survey report; and performing follow-up activities.

Unfiltered Water Supply Guidance Manual

Objective: To supplement the existing Interim Surface Water Treatment Rule guidance for unfiltered surface water supplies and to identify the issues and requirements associated with the new regulations.

Contents: This manual discusses provisions of the Interim Enhanced Surface Water Treatment Rule that will impact unfiltered surface water and; provides guidance on the development of watershed control programs or enhancements of existing watershed control programs to address *Cryptosporidium.* In addition, it provides information and guidance on monitoring for *Cryptosporidium.*

Uncovered Finished Water Reservoirs

Contents: The manual provides detailed information on the following subjects: developing and implementing comprehensive open finished water reservoir management plans based on site-specific conditions; identifying potential sources of contamination in open finished water reservoirs and potential mitigation measures; employing different methods to control the degradation of water quality while it resides in the reservoir; monitoring schemes that can be used to characterize water quality and identify water quality degradation before it becomes severe and is difficult to correct.

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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