

Arsenic and Clarifications to Compliance and New Source Monitoring Rule: A Quick Reference Guide

Overview of the Rule

Title	Arsenic and Clarifications to Compliance and New Source Monitoring Rule 66 FR 6976 (January 22, 2001)
Purpose	To improve public health by reducing exposure to arsenic in drinking water.
General Description	Changes the arsenic MCL from 50 µg/L to 10 µg/L; Sets arsenic MCLG at 0; Requires new systems and new drinking water sources to demonstrate compliance as specified by the State; Clarifies the procedures for determining compliance with the MCLs for IOCs, SOCs, and VOCs.
Utilities Covered	All community water systems (CWSs) and nontransient, noncommunity water systems (NTNCWSs) must comply with the arsenic requirements. EPA estimates that 3,024 CWSs and 1,080 NTNCWSs will have to install treatment to comply with the revised MCL.

Public Health Benefits

Implementation of the Arsenic Rule will result in . . .	<ul style="list-style-type: none"> • Avoidance of 16 to 26 non-fatal bladder and lung cancers per year. • Avoidance of 21 to 30 fatal bladder and lung cancers per year. • Reduction in the frequency of non-carcinogenic diseases.
---	--

Critical Deadlines & Requirements

Consumer Confidence Report Requirements *

Report Due	Report Requirements
July 1, 2002 and beyond	For reports covering calendar years 2001 and beyond, systems that detect arsenic between 5 µg/L and 10 µg/L must include an educational statement in the CCRs.
July 1, 2002 - July 1, 2006	For reports covering calendar years 2001 to 2005, systems that detect arsenic between 10 µg/L and 50 µg/L must include a health effects statement in their CCRs.
July 1, 2007 and beyond	For reports covering calendar year 2006 and beyond, systems that are in violation of the arsenic MLC (10 µg/L) must include a health effects statement in their CCRs.

For Drinking Water Systems

Jan. 22, 2004	All NEW systems/sources must collect initial monitoring samples for all IOCs, SOCs, and VOCs within a period and frequency determined by the State.
Jan. 1, 2005	When allowed by the State, systems may grandfather data collected after this date.
Jan. 23, 2006	The new arsenic MCL of 10 µg/L becomes effective. All systems must begin monitoring or when allowed by the State, submit data that meets grandfathering requirements.
Dec. 31, 2006	Surface water systems must complete initial monitoring or have a State approved waiver.
Dec. 31, 2007	Ground water systems must complete initial monitoring or have a State approved waiver.

For States

Spring 2002	EPA meets and works with States to explain new rule and requirements and to support adoption and implementation activities.
Jan. 22, 2003	State primacy revision applications due.
Jan. 22, 2005	State primacy revision applications due from States that received 2-year extensions.

* For required educational and health effect statements, please see 40 CFR 141.154.



Compliance Determination (IOCs, VOCs, and SOCs)

1. Calculate compliance based on a running annual average at each sampling point.
2. Systems will not be in violation until 1 year of quarterly samples have been collected (unless fewer samples would cause the running annual average to be exceeded.)
3. If a system does not collect all required samples, compliance will be based on the running annual average of the samples collected.

Monitoring Requirements for Total Arsenic⁽¹⁾

Monitoring

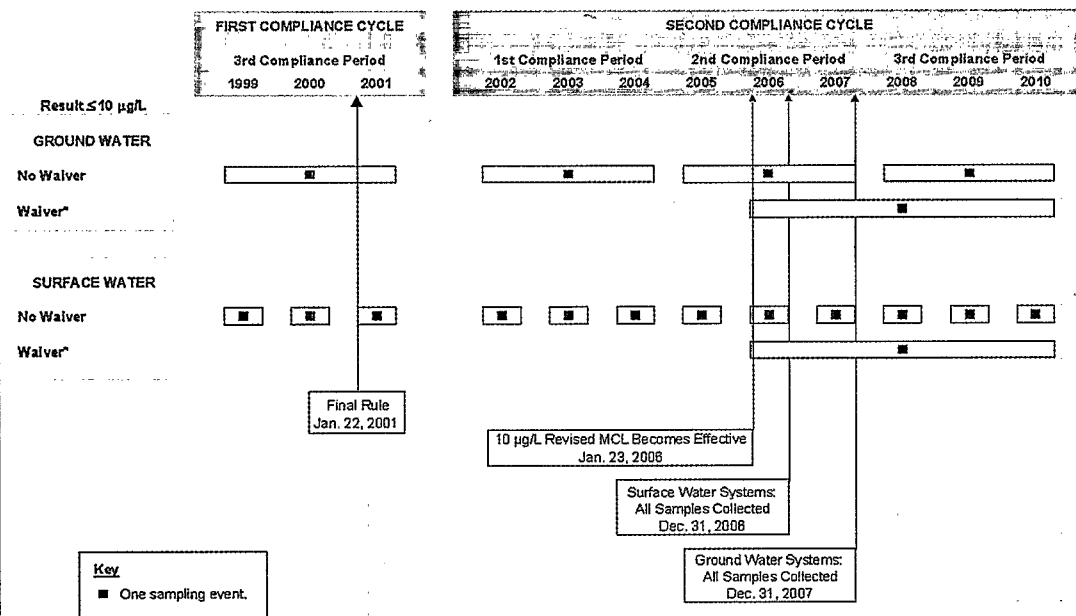
One sample after the effective date of the MCL (January 23, 2006). Surface water systems must take annual samples. Ground water systems must take one sample during the 2005-2007 compliance period. If the monitoring result is less than the MCL ground water systems must collect one sample every 3 years and surface water systems must continue to collect annual samples.

Increased Monitoring

A system with a sampling point result above the MCL must collect quarterly samples at that sampling point, until the system is reliably and consistently below the MCL.

⁽¹⁾ All samples must be collected at each entry point to the distribution system, unless otherwise specified by the State.

Applicability of Standardized Monitoring Framework to Arsenic



*States may issue 9 year monitoring waivers under the January 22, 2001 final arsenic rule. Waivers are not permitted under the current arsenic requirements. To be eligible for a waiver, surface water systems must have monitored annually for at least 3 years. Ground water systems must conduct a minimum of 3 rounds of monitoring with detections limits below 10 µg/L.

For additional information on the Arsenic Rule

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

EPA will provide arsenic training over the next year.

Filter Backwash Recycling Rule: A Quick Reference Guide

Overview of the Rule

Title	Filter Backwash Recycling Rule (FBRR) 66 FR 31086, June 8, 2001, Vol. 66, No. 111
Purpose	Improve public health protection by assessing and changing, where needed, recycle practices for improved contaminant control, particularly microbial contaminants.
General Description	The FBRR requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.
Utilities Covered	Applies to public water systems that use surface water or ground water under the direct influence of surface water, practice conventional or direct filtration, and recycle spent filter backwash, thickener supernatant, or liquids from dewatering processes.

Public Health Benefits

Implementation of FBRR will result in . . .	▶ Reduction in risk of illness from microbial pathogens in drinking water, particularly <i>Cryptosporidium</i> .
Estimated impacts of the FBRR include . . .	<ul style="list-style-type: none">▶ FBRR will apply to an estimated 4,650 systems serving 35 million Americans.▶ Fewer than 400 systems are expected to require capital improvements.▶ Annualized capital costs incurred by public water systems associated with recycle modifications are estimated to be \$5.8 million.▶ Mean annual cost per household is estimated to be less than \$1.70 for 99 percent of the affected households and between \$1.70 and \$100 for the remaining one percent of affected households.

Conventional and Direct Filtration

- ▶ Conventional filtration, as defined in 40 CFR 141.2, is a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal. Conventional filtration is the most common type of filtration.
- ▶ Direct filtration, as defined in 40 CFR 141.2, is a series of processes including coagulation and filtration, but excluding sedimentation, and resulting in substantial particulate removal. Typically, direct filtration can be used only with high-quality raw water that has low levels of turbidity and suspended solids.



Recycle Flows

- ▶ **Spent Filter Backwash Water** - A stream containing particles that are dislodged from filter media when water is forced back through a filter (backwashed) to clean the filter.
- ▶ **Thickener Supernatant** - A stream containing the decant from a sedimentation basin, clarifier or other unit that is used to treat water, solids, or semi-solids from the primary treatment processes.
- ▶ **Liquids From Dewatering Processes** - A stream containing liquids generated from a unit used to concentrate solids for disposal.

Critical Deadlines and Requirements

For Drinking Water Systems

December 8, 2003	Submit recycle notification to the state.
June 8, 2004	Return recycle flows through the processes of a system's existing conventional or direct filtration system or an alternate recycle location approved by the state (a 2-year extension is available for systems making capital improvements to modify recycle location). Collect recycle flow information and retain on file.
June 8, 2006	Complete all capital improvements associated with relocating recycle return location (if necessary).

For States

June 8, 2003	States submit FBRR primacy revision application to EPA (triggers interim primacy).
June 8, 2005	Primacy extension deadline - all states with an extension must submit primacy revision applications to EPA.

What does a recycle notification include?

- ▶ Plant schematic showing origin of recycle flows, how recycle flows are conveyed, and return location of recycle flows.
- ▶ Typical recycle flows (gpm), highest observed plant flow experienced in the previous year (gpm), and design flow for the treatment plant (gpm).
- ▶ State-approved plant operating capacity (if applicable).

What recycle flow information does a system need to collect and retain on file?

- ▶ Copy of recycle notification and information submitted to the state.
- ▶ List of all recycle flows and frequency with which they are returned.
- ▶ Average and maximum backwash flow rates through filters, and average and maximum duration of filter backwash process (in minutes).
- ▶ Typical filter run length and written summary of how filter run length is determined.
- ▶ Type of treatment provided for recycle flows.
- ▶ Data on the physical dimension of the equalization and/or treatment units, typical and maximum hydraulic loading rates, types of treatment chemicals used, average dose, frequency of use, and frequency at which solids are removed, if applicable.

For additional information on the FBRR

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

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

Interim Enhanced Surface Water Treatment Rule: A Quick Reference Guide

Overview of the Rule

Title	Interim Enhanced Surface Water Treatment Rule (IESWTR) 63 FR 69478 - 69521, December 16, 1998, Vol. 63, No. 241
Purpose	Revisions to the Interim Enhanced Surface Water Treatment Rule (IESWTR), the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR), and Revisions to State Primacy Requirements to Implement the Safe Drinking Water Act (SDWA) Amendments 66 FR 3770, January 16, 2001, Vol 66, No. 29
General Description	Improve public health control of microbial contaminants, particularly <i>Cryptosporidium</i> . Prevent significant increases in microbial risk that might otherwise occur when systems implement the Stage 1 Disinfectants and Disinfection Byproducts Rule.
Utilities Covered	Builds upon treatment technique approach and requirements of the 1989 Surface Water Treatment Rule. Relies on existing technologies currently in use at water treatment plants.
	Sanitary survey requirements apply to all public water systems using surface water or ground water under the direct influence of surface water, regardless of size. All remaining requirements apply to public water systems that use surface water or ground water under the direct influence of surface water and serve 10,000 or more people.

Major Provisions

Regulated Contaminants

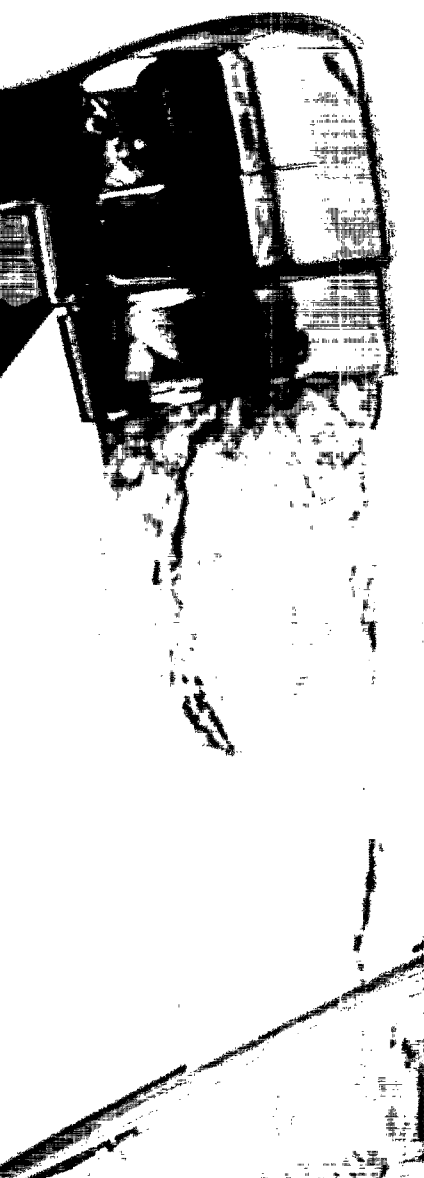
<i>Cryptosporidium</i>	<ul style="list-style-type: none"> Maximum contaminant level goal (MCLG) of zero. 99 percent (2-log) physical removal for systems that filter. Include in watershed control program for unfiltered systems.
Turbidity Performance Standards	<p>Conventional and direct filtration combined filter effluent:</p> <ul style="list-style-type: none"> ≤ 0.3 nephelometric turbidity units (NTU) in at least 95 percent of measurements taken each month. Maximum level of 1 NTU.

Turbidity Monitoring Requirements (Conventional and Direct Filtration)

Combined Filter Effluent	Performed every 4 hours to ensure compliance with turbidity performance standards.
Individual Filter Effluent	Performed continuously (every 15 minutes) to assist treatment plant operators in understanding and assessing filter performance.

Additional Requirements

Disinfection profiling and benchmarking.
Construction of new uncovered finished water storage facilities prohibited.
Sanitary surveys, conducted by the state, for all surface water and ground water under the direct influence of surface water systems regardless of size (every 3 years for community water systems and every 5 years for noncommunity water systems).



Profiling and Benchmarking

Public water systems must evaluate impacts on microbial risk before changing disinfection practices to ensure adequate protection is maintained. The three major steps are:

- ▶ Determine if a public water system needs to profile based on TTHM and HAA5 levels (applicability monitoring)
- ▶ Develop a disinfection profile that reflects daily *Giardia lamblia* inactivation for at least a year (systems using ozone or chloramines must also calculate inactivation of viruses)
- ▶ Calculate a disinfection benchmark (lowest monthly inactivation) based on the profile and consult with the state prior to making a significant change to disinfection practices

Critical Deadlines and Requirements

For Drinking Water Systems

February 16, 1999	Construction of uncovered finished water reservoirs is prohibited.
March 1999	Public water systems lacking ICR or other occurrence data begin 4 quarters of applicability monitoring for TTHM and HAA5 to determine if disinfection profiling is necessary.
April 16, 1999	Systems that have 4 consecutive quarters of HAA5 occurrence data that meet the TTHM monitoring requirements must submit data to the state to determine if disinfection profiling is necessary.
December 31, 1999	Public water systems with ICR data must submit it to states to determine if disinfection profiling is necessary.
April 1, 2000	Public water systems must begin developing a disinfection profile if their annual average (based on 4 quarters of data) for TTHM is greater than or equal to 0.064 mg/L or HAA5 is greater than or equal to 0.048 mg/L.
March 31, 2001	Disinfection profile must be complete.
January 1, 2002	Surface water systems or ground water under the direct influence of surface water systems serving 10,000 or more people must comply with all IESWTR provisions (e.g., turbidity standards, individual filter monitoring).

For States

December 16, 2000	States submit IESWTR primacy revision applications to EPA (triggers interim primacy).
January 2002	States begin first round of sanitary surveys.
December 16, 2002	Primacy extension deadline - all states with an extension must submit primacy revision applications to EPA.
December 2004	States must complete first round of sanitary surveys for community water systems.
December 2006	States must complete first round of sanitary surveys for noncommunity water systems.

Public Health Benefits

Implementation of the IESWTR will result in . . .	<ul style="list-style-type: none">▶ Increased protection against gastrointestinal illnesses from <i>Cryptosporidium</i> and other pathogens through improvements in filtration.▶ Reduced likelihood of endemic illness from <i>Cryptosporidium</i> by 110,000 to 463,000 cases annually.▶ Reduced likelihood of outbreaks of cryptosporidiosis.
Estimated impacts of the IESWTR include . . .	<ul style="list-style-type: none">▶ National total annualized cost: \$307 million▶ 92 percent of households will incur an increase of less than \$1 per month.▶ Less than 1 percent of households will incur an increase of more than \$5 per month (about \$8 per month).

For additional information on the IESWTR

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

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

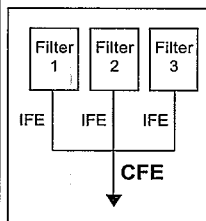
Long Term 1 Enhanced Surface Water Treatment Rule: A Quick Reference Guide

Overview of the Rule

Title	Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) 67 FR 1812, January 14, 2002, Vol. 67, No. 9
Purpose	Improve public health protection through the control of microbial contaminants, particularly <i>Cryptosporidium</i> . Prevent significant increases in microbial risk that might otherwise occur when systems implement the Stage 1 Disinfectants and Disinfection Byproducts Rule.
General Description	Builds upon the requirements of the 1989 Surface Water Treatment Rule (SWTR). Smaller system counterpart of the Interim Enhanced Surface Water Treatment Rule (IESWTR).
Utilities Covered	Public water systems that use surface water or ground water under the direct influence of surface water (GWUDI) and serve fewer than 10,000 people.

Major Provisions

Control of <i>Cryptosporidium</i>	<ul style="list-style-type: none"> ▶ The maximum contaminant level goal (MCLG) is set at zero. ▶ Filtered systems must physically remove 99% (2-log) of <i>Cryptosporidium</i>. ▶ Unfiltered systems must update their watershed control programs to minimize the potential for contamination by <i>Cryptosporidium</i> oocysts. ▶ <i>Cryptosporidium</i> is included as an indicator of GWUDI.
Combined Filter Effluent (CFE) Turbidity Performance Standards	<p>Specific CFE turbidity requirements depend on the type of filtration used by the system.</p> <p>Conventional and direct filtration:</p> <ul style="list-style-type: none"> ▶ ≤ 0.3 nephelometric turbidity units (NTU) in at least 95% of measurements taken each month. ▶ Maximum level of turbidity: 1 NTU. <p>Slow sand and diatomaceous earth (DE) filtration:</p> <ul style="list-style-type: none"> ▶ Continue to meet CFE turbidity limits specified in the SWTR: <ul style="list-style-type: none"> • 1 NTU in at least 95% of measurements taken each month. • Maximum level of turbidity: 5 NTU. <p>Alternative technologies (other than conventional, direct, slow sand, or DE):</p> <ul style="list-style-type: none"> ▶ Turbidity levels are established by the State based on filter demonstration data submitted by the system. <ul style="list-style-type: none"> • State-set limits must not exceed 1 NTU (in at least 95% of measurements) or 5 NTU (maximum).



Turbidity Monitoring Requirements

Combined Filter Effluent	<ul style="list-style-type: none"> ▶ Performed at least every 4 hours to ensure compliance with CFE turbidity performance standards.¹
Individual Filter Effluent (IFE) (for systems using conventional and direct filtration only)	<p>Since the CFE may meet regulatory requirements even though one filter is producing high turbidity water, the IFE is measured to assist conventional and direct filtration treatment plant operators in understanding and assessing individual filter performance.</p> <ul style="list-style-type: none"> ▶ Performed continuously (recorded at least every 15 minutes). ▶ Systems with two or fewer filters may conduct continuous monitoring of CFE turbidity in place of individual filter effluent turbidity monitoring. ▶ Certain follow-up actions are required if the IFE turbidity (or CFE for systems with two filters) exceeds 1.0 NTU in 2 consecutive readings or more (i.e., additional reporting, filter self-assessments, and/or comprehensive performance evaluations (CPEs)).

For additional information on the LT1ESWTR

Call the Safe Drinking Water Hotline at 1-800-426-4791; visit the EPA web site at www.epa.gov/safewater/mdbp/Lt1eswtr.html; or contact your State drinking water representative.

¹ This frequency may be reduced by the State to once per day for systems using slow sand/alternative filtration or for systems serving 500 persons or fewer regardless of the type of filtration used.

Disinfection Profiling and Benchmarking Requirements

Community and non-transient non-community public water systems must evaluate impacts on microbial risk before changing disinfection practices to ensure adequate microbial protection is maintained. This is accomplished through a process called disinfection profiling and benchmarking.

What are the disinfection profiling and benchmarking requirements?

- ▶ Systems must develop a disinfection profile, which is a graphical compilation of weekly inactivation of *Giardia lamblia*, taken on the same calendar day each week over 12 consecutive months. (Systems using chloramines, ozone, or chlorine dioxide for primary disinfection must also calculate inactivation of viruses). Results must be available for review by the State during sanitary surveys.
- ▶ A State may deem a profile unnecessary if the system has sample data collected after January 1, 1998—during the month of warmest water temperature and at maximum residence time in the distribution system—indicating TTHM levels are below 0.064 mg/L and HAA5 levels are below 0.048 mg/L.
- ▶ Prior to making a significant change to disinfection practices, systems required to develop a profile must calculate a disinfection benchmark and consult with the State. The benchmark is the calculation of the lowest monthly average of inactivation based on the disinfection profile.

Additional Requirements

- ▶ Construction of new uncovered finished water reservoirs is prohibited.

Critical Deadlines and Requirements

For Drinking Water Systems

March 15, 2002	Construction of uncovered finished reservoirs is prohibited.
July 1, 2003	No later than this date, systems serving between 500-9,999 persons must report to the State: <ul style="list-style-type: none"> ▶ Results of optional monitoring which show levels of TTHM < 0.064 mg/L <u>and</u> HAA5 < 0.048 mg/L, OR ▶ System has started profiling.
January 1, 2004	No later than this date, systems serving fewer than 500 persons must report to the State: <ul style="list-style-type: none"> ▶ Results of optional monitoring which show levels of TTHM < 0.064 mg/L <u>and</u> HAA5 < 0.048 mg/L, OR ▶ System has started profiling.
June 30, 2004	Systems serving between 500 and 9,999 persons must complete their disinfection profile unless the State has determined it is unnecessary.
December 31, 2004	Systems serving fewer than 500 persons must complete their disinfection profile unless the State has determined it is unnecessary.
January 14, 2005	Surface water systems or GWUDI systems serving fewer than 10,000 people must comply with the applicable LT1ESWTR provisions (e.g., turbidity standards, individual filter monitoring, <i>Cryptosporidium</i> removal requirements, updated watershed control requirements for unfiltered systems).

For States

January 2002	As per the IESWTR, States begin first round of sanitary surveys (at least every 3 years for community water systems and every 5 years for non-community water systems).
October 14, 2003	States are encouraged to submit final primacy applications to EPA.
January 14, 2004	Final primacy applications must be submitted to EPA unless granted an extension.
December 2004	States must complete first round of sanitary surveys for community water systems (as per the IESWTR).
January 14, 2006	Final primacy revision applications from States with approved 2-year extension agreements must be submitted to EPA.
December 2006	States must complete first round of sanitary surveys for non-community water systems (as per the IESWTR).

Public Health Benefits

Implementation of the LT1ESWTR will result in ...	<ul style="list-style-type: none"> ▶ Increased protection against gastrointestinal illnesses from <i>Cryptosporidium</i> and other pathogens through improvements in filtration. ▶ Reduced likelihood of endemic illness from <i>Cryptosporidium</i> by an estimated 12,000 to 41,000 cases annually. ▶ Reduced likelihood of outbreaks of cryptosporidiosis.
Estimated impacts of the LT1ESWTR include ...	<ul style="list-style-type: none"> ▶ National total annualized cost: \$39.5 million. ▶ 90% of affected households will incur an increase of less than \$1.25 per month. ▶ One percent of affected households are likely to incur an increase of more than \$10 per month.

Radionuclides Rule: A Quick Reference Guide

Overview of the Rule

Title	Radionuclides Rule 66 FR 76708 December 7, 2000 Vol. 65, No. 236
Purpose	Reducing the exposure to radionuclides in drinking water will reduce the risk of cancer. This rule will also improve public health protection by reducing exposure to all radionuclides.
General Description	The rule retains the existing MCLs for combined radium-226 and radium-228, gross alpha particle radioactivity, and beta particle and photon activity. The rule regulates uranium for the first time.
Utilities Covered	Community water systems, all size categories.

Public Health Benefits

Implementation of the Radionuclides Rule will result in . . .	Reduced uranium exposure for 620,000 persons, protection from toxic kidney effects of uranium, and a reduced risk of cancer.
Estimated impacts of the Radionuclides Rule include . . .	Annual compliance costs of \$81 million. Only 795 systems will have to install treatment.

Regulated Contaminants

Regulated Radionuclide	MCL	MCLG
Beta/photon emitters*	4mrem/yr	0
Gross alpha particle	15 pCi/L	0
Combined radium-226/228	5 pCi/L	0
Uranium	30µg/L	0

*A total of 168 individual beta particle and photon emitters may be used to calculate compliance with the MCL.

Critical Deadlines & Requirements

For Drinking Water Systems

June 2000 - December 8, 2003	When allowed by the State, data collected between these dates may be eligible for use as grandfathered data (excluding beta particle and photon emitters).
December 8, 2003	Systems begin initial monitoring under State-specified monitoring plan unless the State permits use of grandfathered data.
December 31, 2007	All systems must complete initial monitoring.

For States

December 2000 - December 2003	States work with systems to establish monitoring schedules.
December 8, 2000	States should begin to update vulnerability assessments for beta photon and particle emitters and notify systems of monitoring requirements.
Spring 2001	EPA meets and works with States to explain new rules and requirements and to initiate adoption and implementation activities.
December 8, 2002	State submits primacy revision application to EPA. (EPA approves within 90 days.)

Monitoring Requirements

Gross Alpha, Combined Radium-226/228, and Uranium (1)

Beta Particle and Photon Radioactivity (1)

Initial Monitoring

Four consecutive quarters of monitoring.

No monitoring required for most CWSs. Vulnerable CWSs (2) must sample for:

- Gross beta: quarterly samples.
- Tritium and Strontium-90: annual samples.

Reduced Monitoring

If the average of the initial monitoring results for each contaminant is below the detection limit: One sample every 9 years.

If the average of the initial monitoring results for each contaminant is greater than or equal to the detection limit, but less than or equal to one-half the MCL: One sample every 6 years.

If the average of the initial monitoring results for each contaminant is greater than one-half the MCL, but less than or equal to the MCL: One sample every 3 years.

If the running annual average of the gross beta particle activity minus the naturally occurring potassium-40 activity is less than or equal to 50 pCi/L: One sample every 3 years.

Increased Monitoring

A system with an entry point result above the MCL must return to quarterly sampling until 4 consecutive quarterly samples are below the MCL.

If gross beta particle activity minus the naturally occurring potassium-40 activity exceeds 50 pCi/L, the system must:

- Speciate as required by the State.
- Sample at the initial monitoring frequency.

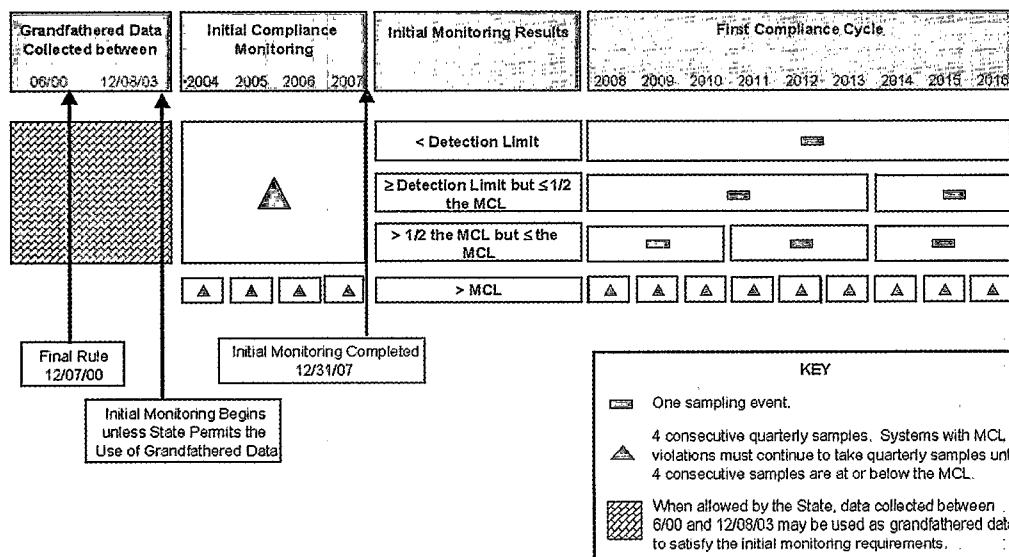
- (1) All samples must be collected at each entry point to the distribution system.
(2) The rule also contains requirements for CWSs using waters contaminated by effluents from nuclear facilities.

Grandfathering of Data

When allowed by the State, data collected between June, 2000 and December 8, 2003 may be used to satisfy the initial monitoring requirements if samples have been collected from:

- Each entry point to the distribution system (EPTDS).
- The distribution system, provided the system has a single EPTDS.
- The distribution system, provided the State makes a written justification explaining why the sample is representative of all EPTDS.

Applicability of the Standardized Monitoring Framework to Radionuclides (Excluding the Beta Particle and Photon Emitters)



For additional information on the Radionuclides Rule

Call the Safe Drinking Water Hotline at 1-800-426-4791; visit the EPA Web site at www.epa.gov/safewater; or contact your State drinking water representative. EPA will provide radionuclide training over the next year.

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

Overview of the Rule

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

Public Health Benefits

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

Critical Deadlines and Requirements

For Drinking Water Systems

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

For States

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



Regulated Contaminants/Disinfectants

Regulated Contaminants	MCL (mg/L)	MCLG (mg/L)	Regulated Disinfectants	MRDL* (mg/L)	MRDLG* (mg/L)
Total Trihalomethanes (TTHM)	0.080				
Chloroform Bromodichloromethane Dibromochloromethane Bromoform		- zero 0.06 zero	Chlorine	4.0 as Cl ₂	4
Five Haloacetic Acids (HAA5)	0.060		Chloramines	4.0 as Cl ₂	4
Monochloroacetic acid Dichloroacetic acid Trichloroacetic acid Bromoacetic acid Dibromoacetic acid		- zero 0.3 - -	Chlorine dioxide	0.8	0.8
Bromate (plants that use ozone)	0.010	zero	*Stage 1 DBPR includes maximum residual disinfectant levels (MRDLs) and maximum residual disinfectant level goals (MRDLGs) which are similar to MCLs and MCLGs, but for disinfectants.		
Chlorite (plants that use chlorine dioxide)	1.0	0.8			

Treatment Technique

Enhanced coagulation/enhanced softening to improve removal of DBP precursors (See Step 1 TOC Table) for systems using conventional filtration treatment.

Step 1 TOC Table - Required % Removal of TOC

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

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

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

Routine Monitoring Requirements

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

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

For additional information on the Stage 1 DBPR

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

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

Total Coliform Rule: A Quick Reference Guide

Overview of the Rule

Title	Total Coliform Rule (TCR) 54 FR 27544-27568, June 29, 1989, Vol. 54, No. 124 ¹
Purpose	Improve public health protection by reducing fecal pathogens to minimal levels through control of total coliform bacteria, including fecal coliforms and <i>Escherichia coli</i> (<i>E. coli</i>).
General Description	Establishes a maximum contaminant level (MCL) based on the presence or absence of total coliforms, modifies monitoring requirements including testing for fecal coliforms or <i>E. coli</i> , requires use of a sample siting plan, and also requires sanitary surveys for systems collecting fewer than five samples per month.
Utilities Covered	The TCR applies to all public water systems.

Public Health Benefits

Implementation of the TCR has resulted in . . .	<ul style="list-style-type: none"> Reduction in risk of illness from disease causing organisms associated with sewage or animal wastes. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and associated headaches and fatigue.
---	--

What are the Major Provisions?

ROUTINE Sampling Requirements

- ▶ Total coliform samples must be collected at sites which are representative of water quality throughout the distribution system according to a written sample siting plan subject to state review and revision.
- ▶ Samples must be collected at regular time intervals throughout the month except groundwater systems serving 4,900 persons or fewer may collect them on the same day.
- ▶ Monthly sampling requirements are based on population served (see table on next page for the minimum sampling frequency).
- ▶ A reduced monitoring frequency may be available for systems serving 1,000 persons or fewer and using only ground water if a sanitary survey within the past 5 years shows the system is free of sanitary defects (the frequency may be no less than 1 sample/quarter for community and 1 sample/year for non-community systems).
- ▶ Each total coliform-positive routine sample must be tested for the presence of fecal coliforms or *E. coli*.
- ▶ If any routine sample is total coliform-positive, repeat samples are required.

REPEAT Sampling Requirements

- ▶ Within 24 hours of learning of a total coliform-positive ROUTINE sample result, at least 3 REPEAT samples must be collected and analyzed for total coliforms:
 - ▶ One REPEAT sample must be collected from the same tap as the original sample.
 - ▶ One REPEAT sample must be collected within five service connections upstream.
 - ▶ One REPEAT sample must be collected within five service connections downstream.
 - ▶ Systems that collect 1 ROUTINE sample per month or fewer must collect a 4th REPEAT sample.
- ▶ If any REPEAT sample is total coliform-positive:
 - ▶ The system must analyze that total coliform-positive culture for fecal coliforms or *E. coli*.
 - ▶ The system must collect another set of REPEAT samples, as before, unless the MCL has been violated and the system has notified the state.

Additional ROUTINE Sample Requirements

- ▶ A positive ROUTINE or REPEAT total coliform result requires a minimum of five ROUTINE samples be collected the following month the system provides water to the public unless waived by the state.

¹ The June 1989 Rule was revised as follows: Corrections and Technical Amendments, 6/19/90 and Partial Stay of Certain Provisions (Variance Criteria) 56 FR 1556-1557, Vol 56, No 10.

Note: The TCR is currently undergoing the 6 year review process and may be subject to change.



Public Water System ROUTINE Monitoring Frequencies

Population	Minimum Samples/ Month	Population	Minimum Samples/ Month	Population	Minimum Samples/ Month
25-1,000*	1	21,501-25,000	25	450,001-600,000	210
1,001-2,500	2	25,001-33,000	30	600,001-780,000	240
2,501-3,300	3	33,001-41,000	40	780,001-970,000	270
3,301-4,100	4	41,001-50,000	50	970,001-1,230,000	300
4,101-4,900	5	50,001-59,000	60	1,230,001-1,520,000	330
4,901-5,800	6	59,001-70,000	70	1,520,001-1,850,000	360
5,801-6,700	7	70,001-83,000	80	1,850,001-2,270,000	390
6,701-7,600	8	83,001-96,000	90	2,270,001-3,020,000	420
7,601-8,500	9	96,001-130,000	100	3,020,001-3,960,000	450
8,501-12,900	10	130,001-220,000	120	≥ 3,960,001	480
12,901-17,200	15	220,001-320,000	150		
17,201-21,500	20	320,001-450,000	180		

*Includes PWSs which have at least 15 service connections, but serve <25 people.

What are the Other Provisions?

Systems collecting fewer than 5 ROUTINE samples per month . . .	Must have a sanitary survey every 5 years (or every 10 years if it is a non-community water system using protected and disinfected ground water).**
Systems using surface water or ground water under the direct influence of surface water (GWUDI) and meeting filtration avoidance criteria . . .	Must collect and have analyzed one coliform sample each day the turbidity of the source water exceeds 1 NTU. This sample must be collected from a tap near the first service connection.

** As per the IESWTR, states must conduct sanitary surveys for community surface water and GWUDI systems in this category every 3 years (unless reduced by the state based on outstanding performance).

How is Compliance Determined?

- ▶ Compliance is based on the presence or absence of total coliforms.
- ▶ Compliance is determined each calendar month the system serves water to the public (or each calendar month that sampling occurs for systems on reduced monitoring).
- ▶ The results of ROUTINE and REPEAT samples are used to calculate compliance.

A Monthly MCL Violation is Triggered if:

A system collecting fewer than 40 samples per month . . .	Has greater than 1 ROUTINE/REPEAT sample per month which is total coliform-positive.
A system collecting at least 40 samples per month . . .	Has greater than 5.0 percent of the ROUTINE/REPEAT samples in a month total coliform-positive.

An Acute MCL Violation is Triggered if:

Any public water system . . .	Has any fecal coliform- or <i>E. coli</i> -positive REPEAT sample <u>or</u> has a fecal coliform- or <i>E. coli</i> -positive ROUTINE sample followed by a total coliform-positive REPEAT sample.
-------------------------------	---

What are the Public Notification and Reporting Requirements?

For a Monthly MCL Violation	<ul style="list-style-type: none"> ▶ The violation must be reported to the state no later than the end of the next business day after the system learns of the violation. ▶ The public must be notified within 14 days.²
For an Acute MCL Violation	<ul style="list-style-type: none"> ▶ The violation must be reported to the state no later than the end of the next business day after the system learns of the violation. ▶ The public must be notified within 72 hours.²
Systems with ROUTINE or REPEAT samples that are fecal coliform- or <i>E. coli</i> -positive . . .	Must notify the state by the end of the day they are notified of the result or by the end of the next business day if the state office is already closed.

For additional information on the TCR

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

² The revised Public Notification Rule will extend the period allowed for public notice of monthly violations to 30 days and shorten the period for acute violations to 24 hours. These revisions are effective for all systems by May 6, 2002 and are detailed in 40 CFR Subpart Q.