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EPA CONSOLIDATED RULE SUMMARY FOR THE CHEMICAL PHASES

Table of Contents

Table of Contents (continued)

Table of Contents (continued)

Table of Contents (continued)

STANDARDIZED MONITORING FRAMEWORK

INTRODUCTION

This document summarizes the U.S. Environmental Protection Agency's (EPA) National Primary Drinking Water Regulations (NPDWRs) for chemical contaminants regulated under Phases I, II, IIB and V (see Table I). The Standardized Monitoring Framework was originally promulgated under the Phase II Rule and revised under Phases IIB and V.[1] The provisions that apply to all contaminants are summarized in *The Framework* section. Provisions that apply only to one contaminant group are explained in the section for that contaminant group. Monitoring under the framework began in 1993.

PURPOSE

The goal of the Standardized Monitoring Framework is to streamline the drinking water monitoring requirements. The main features of the framework are the standardization of monitoring requirements within contaminant groups and the synchronization of monitoring schedules across contaminant groups. Contaminant groups are inorganic chemicals (IOCs), volatile organic compounds (VOCs) and synthetic organic compounds (SOCs). There are also three contaminants treated separately because of their unusual characteristics - asbestos, nitrate and nitrite.

APPLICABILITY

The framework applies to the 8 contaminants in EPA's Phase I Rule, the 32 contaminants in the Phase II Rule, the 2 remaining contaminants in the Phase IIB Rule,[2] and the contaminants 23 in the Phase V Rule - or 65 in all. The categories of contaminants regulated under each rule and those that remain unregulated are listed in Table I on the next page. The Maximum Contaminant Level Goals (MCLGs), Maximum Contaminant Levels (MCLs) and health effects appear in Table II.

The framework is designed for source water related contaminants such as solvents, pesticides, metals and radionuclides. EPA intends that the monitoring requirements of future NPDWRs will fit within the framework. The Standardized Monitoring Framework applies to all community water systems (CWSs) and nontransient, noncommunity water systems (NTNCWSs). For nitrate and nitrite, the framework also applies to transient noncommunity water systems (TNCWSs).

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(1) Phase II Rule [56 FR 3578 (Definitions), 3579 (inorganic chemicals), 3583 (organic compounds) and 3593 (unregulated contaminants) as published on January 30, 1991], and revised under the Phase IIB Rule [56 FR 30274 (inorganic chemicals) and 30277 (volatile organic compounds) as published on July 1, 1991], and further revised under the Phase V Rule [57 FR 31838 (Definitions), p.31838 (inorganic chemicals), p.31841 (VOCs) and p.31842 (SOCs) as published in July 17, 1992].

(2) As a result of litigation, the three aldicarbs have been administratively stayed until further notice. Their former monitoring requirements as regulated SOCs have been replaced with the monitoring requirements for unregulated contaminants under §141.40(n). See 57 FR 22178, May 27, 1992.

TABLE I

CONTAMINANTS REGULATED UNDER PHASES I, II, IIB & V

[AND UNREGULATED CONTAMINANTS FOR WHICH THERE ARE MONITORING REQUIREMENTS]

PHASE OF REGULATION	INORGANIC CONTAMINANTS	SYNTHETIC ORGANIC COMPOUNDS	VOLATILE ORGANIC COMPOUNDS
PHASES I, II, & IIB **9 IOCs** **15 SOCs** **18 VOCs** Phase I - 8 Phase II - 32 Phase IIB - 2 Total - 42	ARSENIC (IPDWR) ASBESTOS (II) BARIUM (IIB) CADMIUM (II) CHROMIUM (II) FLUORIDE (II) MERCURY (II) NITRATE (II) NITRITE (II) SELENIUM (II)	ALACHLOR (II) ATRAZINE (II) CARBOFURAN (II) CHLORDANE (II) EDB (II) DBCP (II) HEPTACHLOR (II) HEPTACHLOR EPOXIDE (II) LINDANE (II) METHOXYCHLOR (II) TOXAPHENE (II) PCBs (II) PENTACHLOROPHENOL (IIB) 2,4-D (II) 2,4,5-TP (II)	BENZENE (I) CARBON TETRACHLORIDE (I) PARA-DICHLOROBENZENE (I) TRICHLOROETHYLENE (I) VINYL CHLORIDE (I) 1,1,1-TRICHLOROETHANE (I) 1,1-DICHLOROETHYLENE (I) 1,2-DICHLOROETHANE (I) CIS-1,2-DICHLOROETHYLENE (II) ETHYLBENZENE (II) MONOCHLOROBENZENE (II) O-DICHLOROBENZENE (II) STYRENE (II) TETRACHLOROETHYLENE (II) TOLUENE (II) TRANS-1,2-DICHLOROETHYLENE (II) XYLENES (II) 1,2-DICHLOROPROPANE (II)
Phase V **5 IOCs** **15 SOCs** **3 VOCs** Total - 23	ANTIMONY BERYLLIUM CYANIDE NICKEL THALLIUM	BENZO(A)PYRENE DALAPON DI(ETHYLHEXYL)-ADIPATE DI(ETHYLHEXYL)-PHTHALATE DINOSEB DIQUAT ENDOTHALL ENDRIN GLYPHOSATE HEXACHLOROBENZENE HEXACHLOROCYCLO-PENTADIENE OXYMAL PICLORAM SIMAZINE 2,3,7,8-TCDD (DIOXIN)	DICHLOROMETHANE 1,1,2-TRICHLOROETHANE 1,2,4-TRICHLOROBENZENE
UNREGULATED **1 IOC** **13 SOCs** **21 VOCs** Total - 35	SULFATE	ALDICARB ALDICARB SULFOXIDE ALDICARB SULFONE ALDRIN BUTACHLOR CARBARYL DICAMBA DIELDRIN METHOMYL METOLACHLOR METRIBUZIN PROPACHLOR 3-HYDROXYCARBOFURAN	BROMOBENZENE BROMODICHLOROMETHANE BROMOFORM BROMOMETHANE CHLOROBENZENE CHLORODIBROMETHANE CHLOROFORM CHLOROETHANE CHLOROMETHANE o-CHLOROTOLUENE p-CHLOROTOLUENE DICHLOROBENZENE m-DICHLOROBENZENE 1,1-DICHLOROETHANE 1,3-DICHLOROPROPANE 2,2-DICHLOROPROPANE 1,3-DICHLOROPROPENE 1,1-DICHLOROPROPENE 1,1,1,2-TETRACHLOROTHANE 1,1,2,2-TETRACHLOROTHANE 1,2,3-TRICHLOROPROPANE

Table II

MCLs, MCLGs & HEALTH EFFECTS

Contaminants	MCLG (mg/l)	MCL (mg/l)	Potential Health Effects
Phase I			
1,1-Dichloroethylene	0.007	0.007	Liver/Kidney Effects
1,1,1-Trichloroethane	0.2	0.2	Nervous System Effects
1,2-Dichloroethane	zero	0.005	Cancer
Benzene	zero	0.005	Cancer
Carbon Tetrachloride	zero	0.005	Cancer
p-Dichlorobenzene	0.075	0.075	Cancer
Trichloroethylene	zero	0.005	Cancer
Vinyl Chloride	zero	0.002	Cancer
Phase II			
1,2,4 Trichlorobenzene	0.07	0.07	Liver/Kidney Damage
1,1,2-Trichloroethane	0.003	0.005	Kidney/Liver Damage
1,2-Dichloropropane	zero	0.005	Liver/Kidney Effects, Cancer
2,3,7,8-TCDD (Dioxin)	zero	0.00000003	Cancer
2,4-D*	0.07	0.07	Liver/Kidney Damage
2,4,5-TP	0.05	0.05	Liver/Kidney Damage
Acrylamide	zero	TT	Cancer
Alachlor	zero	0.002	Cancer
Aldicarb Sulfone**	0.001	0.002	Nervous System Effects
Aldicarb Sulfoxide**	0.001	0.004	Nervous System Effects
Aldicarb**	0.001	0.003	Nervous System Effects
Asbestos (fiber > 10 um/l)	7 MFL	7 MFL	Cancer/Lung Tumors
Atrazine	0.003	0.003	Heart/Mammary Glands/ Reproductive Effects
Barium*	2	2	Circulatory System Effects
Cadmium*	0.005	0.005	Kidney Effects
Carbofuran	0.04	0.04	Nervous/Reproductive System Damage
Chlordane	zero	0.002	Cancer
Chlorobenzene	0.1	0.1	Nervous System & Liver
Chromium (total)*	0.1	0.1	Liver/Kidney/Circulatory Disorder
cis-1,2-Dichloroethylene	0.007	0.07	Liver/Kidney/Nervous/Circulatory
DBCP	zero	0.0002	Cancer
EDB	zero	0.0000	Cancer
Epichlorohydrin	zero	TT	Cancer
Ethylbenzene	0.7	0.7	Liver/Kidney/Nervous System Damage
Heptachlor Epoxide	zero	0.0002	Cancer
Heptachlor	zero	0.0004	Cancer

Contaminants	MCLG (mg/l)	MCL (mg/l)	Potential Health Effects
Lindane	0.0002	0.0002	Liver/Kidney/Nervous/Immune/Circulatory
Mercury (inorganic)*	0.002	0.002	Kidney/Central Nervous System Disorder
Methoxychlor	0.04	0.04	Liver/Kidney/Nervous/Reproductive
Nitrate*	10	10	Methemoglobinemia
Nitrite	1	1	Methemoglobinemia
o-Dichlorobenzene	0.6	0.6	Liver/Kidney/Blood Cell damage
PCBs	zero	0.0005	Cancer
Pentachlorophenol	zero	0.001	Liver/Kidney Effects
Selenium	0.05	0.05	Selonoala
Styrene	0.1	0.1	Liver Effects, Nervous System Damage
Tetrachloroethylene	zero	0.005	Cancer
Toluene	1	1	Liver/Kidney/Nervous/Circulatory
Toxaphene	zero	0.0003	Cancer
trans-1,2-Dichloroethylene	0.1	0.1	Liver/Kidney/Nervous/Circulatory
Xylenes (total)	10	10	Liver/Kidney/Nervous System Effects
Phase V			
Adipates	0.4	0.4	Liver/Testes Damage
Antimony	zero	0.006	Decrease Longevity, Altered Blood Levels
Beryllium	0.004	0.004	Bone/Lung Damage
Cyanide	0.2	0.2	Spleen/Brain/Liver Damage
Dalapon	0.2	0.2	Kidney/Liver Damage
Dichloromethane	zero	0.005	Cancer
Dinoseb	0.007	0.007	Thyroid/Reproductive Organ Damage
Diquat	0.1	0.1	Liver/Kidney/Gastrointestinal Tract Damage
Endothall	0.1	0.1	Liver/Kidney/Gastrointestinal/Reproductive Damage
Endrin	0.002	0.002	Liver/Kidney/Heart Damage
Glyphosate	0.7	0.7	Liver/Kidney Damage
Hexachlorobenzene	zero	0.001	Cancer
Hexachlorocyclopentadiene	0.05	0.05	Kidney/Stomach Damage
Nickel	0.1	0.1	Heart/Liver Damage
Oxamyl	0.2	0.2	Kidney Damage
PAHs (Benzo(a)pyrene)	zero	0.0002	Cancer
Phthalates	zero	0.006	Cancer
Picloram	0.5	0.5	Kidney/Liver Damage
Simazine	0.004	0.004	Cancer
Thallium	0.0005	0.002	Kidney/Liver/Brain/Intestine Damage

Notes:
* Indicates original contaminants with interim standards which have or will be revised.
** Regulation currently not in effect.
TT = Treatment Technique
MFL = Millions of Fibers per Liter

THE FRAMEWORK

To standardize monitoring requirements across rules and contaminant groups, EPA has established a ***nine-year "compliance cycle"***, with the first cycle beginning on January 1, 1993. The nine year cycle contains three ***three-year "compliance periods"***. The first period extends from 1993 to 1995, the second from 1996 to 1998, and the third from 1999 to 2001. The second compliance cycle begins in 2002 and extends through 2010. The Standardized Monitoring Framework encompasses both sampling and sampling waiver activities.

SAMPLING FREQUENCIES

All systems must comply with the sampling requirements, unless a waiver has been granted in writing by the State. There are no specific deadlines for the issuance of sampling waivers per se, but the sampling schedules for individual systems constitute de facto deadlines, in that the expectation of receiving a waiver will not suffice as a defense for failing to meet the sampling schedule.

INITIAL SAMPLING

The ***initial*** sampling requirements within each contaminant group are the same for all systems regardless of size, but vary by system size for Phase V (150 service connections) as to when sampling must begin. The initial sampling requirements are the same for all VOCs and for all SOCs regardless of water source. The requirements differ for IOCs based on surface water and ground water.

The framework provides States the flexibility to determine when a system must sample during the initial compliance period. EPA is requiring States to develop monitoring plans for the initial compliance period. These plans will typically schedule some water systems for initial monitoring in each of the three years.[3]

For contaminants regulated under ***Phases II and IIB***, all systems begin initial sampling in the compliance period starting January 1, 1993. Repeat sampling for these systems is scheduled for the subsequent compliance periods of 1996-1998 and beyond.

For contaminants regulated under Phases V, systems with ≥150 service connections also begin initial sampling in the compliance period starting January 1, 1993. ***But, for systems with less than 150 service connections, initial sampling for the contaminants regulated under Phase V begin in the second three-year compliance period starting January 1, 1996.*** Repeat sampling for these systems will occur during the subsequent compliance periods of 1999-2001 and beyond.

States may wish to schedule the initial sampling based on system size, geography, vulnerability or other criteria, but States must consider lab capacity in developing their monitoring plans.

REPEAT SAMPLING

Repeat sampling requirements vary by system size for SOCs and by the water source for VOCs and IOCs. All sampling points which exceed the MCL for an IOC must conduct quarterly sampling, until the State determines the system is reliably and consistently below the maximum contaminant level (MCL). All sampling points which detect a VOC or SOC must conduct quarterly sampling until the state determines that the analytical results are reliably and consistently below the MCL.

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(3) See §142.16(e)(2).

GRANDFATHERING DATA [4]

Sampling data collected before 1993 may be used to satisfy a sampling point's initial sampling requirements. These provisions are subject to some restrictions, which are unique to each contaminant group. Use of grandfathered data would move the sampling schedule forward by scheduling repeat sampling frequencies in 1993. Repeat frequencies are generally lower than initial sampling frequencies.[5]

SYSTEMS AFFECTED [6]

All CWSs and NTNCWSs must comply with monitoring requirements for all regulated contaminants. The requirements for nitrate and nitrite are also applicable to TNCWSs.

SAMPLING POINTS [7]

Sampling must be conducted at each entry point to the distribution system. Sampling points must be representative of the well(s) or source water after treatment. If any sampling point in a system violates an MCL, the entire system is in violation of the MCL.

COMPOSITE SAMPLING [8]

States may allow composite sampling from no more than five sampling points, provided that the MDL is less than one-fifth of the MCL. Samples must be composited by a certified laboratory.

(1) For systems serving ***more than 3,300*** people, compositing is allowed ***only*** among sampling points within a single system.

(2) For systems serving ≤ ***3,300 people*** compositing among different systems is permitted.

RELIABLY & CONSISTENTLY BELOW THE MCL [9]

"Reliably and consistently" below the MCL means that although contaminants have been detected in a water supply, the State has sufficient knowledge of the contamination source and extent of contamination to predict that the MCL will not be exceeded. States should consider the quality and amount of data, the length of time covered and the volatility/stability of monitoring during that time, and the proximity of the results to the MCL. Wide variations in the analytical results or analytical results close to the MCL are examples of situations where systems would not qualify as reliably and consistently below the MCL.

(1) With some exceptions,[10] ***ground water systems must take a minimum of two quarterly samples*** and ***surface water systems must take a minimum of four quarterly samples*** before the State may determine that the analytical results are reliably and consistently below the MCL.

(2) If a State cannot predict that the sampling point will remain below the MCL using this minimal data set, it should continue collecting quarterly data until it can make such a prediction.

(3) If a state determines that the baseline of data is reliably and consistently below the MCL, the sampling frequency may be reduced according to the provisions specific to that contaminant.

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(4) For Grandfathering Data, see §§141.23(c)(4) for IOCs, 141.24(f)(5) and 141.24(f)(18) for VOCs, and 141.24(h)(14) for SOCs.

(5) For IOCs, initial and repeat sampling frequencies are the same. For SOCs and VOCs, the repeat sampling frequencies are less than the initial frequencies.

(6) For Systems Affected, see §§ 141.23 for IOCs, 141.24(f) for VOCs and 141.24(h) for SOCs.

(7) For Sampling Points, see §§141.23(a) for IOCs, 141.24(f)(1)-(3) for VOCs and 141.24(h)(1)-(3) for SOCs.

(8) For Composite Sampling, see §§141.23(a)(4) for IOCs, 141.24(f)(14) for VOCs and 141.24(h)(10) for SOCs.

(9) For Reliably & Consistently Below the MCL, see §§141.23(c)(8) for IOCs, 141.24(f)(11)-(12) for VOCs and 141.24(h)(7)-(8) for SOCs.

(10) These exceptions are for cases of ***exceeding the MCL***, when the minimum baseline of data required becomes four quarterly samples for all systems.

CONFIRMATION SAMPLES [11]

States may require a confirmation sample for any sample exceeding the MCL, in order to more precisely determine actual concentrations. Confirmation samples must be taken from the same sampling point no later than two weeks after the initial sample. If a confirmation sample is taken, the average of results from the two samples is to be used for purposes of compliance determination.

INCREASED SAMPLING FREQUENCIES [12]

States may increase sampling frequencies to confirm positive or negative results, or to detect variations within a water system.

SAMPLING WAIVERS

All systems must comply with the sampling requirements, unless a waiver has been granted in writing by the State. Waivers of sampling requirements must be for specified contaminants and must be based on both a vulnerability assessment and the analytical results of previous sampling.[13] This means the State must consider ***all*** analytical results for the sampling points under review, whether the samples were taken by the State, by the water system or by other parties *e.g.*, U.S. Dept. of Agriculture, Soil Conservation Service (SCS).

The vulnerability assessment may be based on a determination that either the contaminant has not been ***used*** in the area or the source water is not ***susceptible*** to contamination.

(1) Waiver determinations are to be made for specified sampling points.

(2) States may issue a waiver for a specific contaminant to all of the sampling points within a water system or only to some of them.

(3) States may issue area wide waivers to all sampling points or just certain sampling points within the area. In the latter case, the State must clearly designate which sampling points are covered under the waiver. Designated waiver areas may be watersheds, recharge zones or political jurisdictions (*e.g.*, counties).

(4) Vulnerability assessments may be conducted by States, water systems, third-parties, or combinations thereof, but States must approve and ***sign all final waiver determinations.***

(5) ***Systems which have not received written waivers must sample according to the required frequencies.***

(6) There are two basic types of waivers for SOCs and VOCs:

(a) Use Waiver: A determination is made whether a contaminant was used, manufactured, or stored in the area of review for the sampling points in question. If the answer to any of the inquiries is yes or unknown, that sampling point may be "susceptible" to contamination, and a "use waiver" may not be granted.

(b) Susceptibility Waiver: If a use waiver is inapplicable, a system may conduct a thorough vulnerability assessment of the source water to determine its susceptibility to contamination. Consideration of prior sampling results is critical to this review, because the detection of any SOC or VOC rules out the use of geological protection as the basis of granting a waiver. In such cases, waivers might still be granted on the bases of a history of effective land use management combined with several continuous years of sampling results showing no detects.

Systems with no known susceptibility to contamination may be granted a "susceptibility waiver." If susceptibility cannot be determined, or the sampling point is susceptible to contamination, the sampling point is not eligible for a waiver and must sample at the regulatory minimum frequency [see §§141.24(f)(8) and 141.24(h)(6)].

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(11) For Confirmation Samples, see §§141.23(f) for IOCs, 141.24(f)(13) for VOCs and 141.24(h)(9) for SOCs.

(12) For Increased Sampling Frequencies, see §§ 141.23(g) for IOCs, 141.24(f)(19) for VOCs and 141.24(h)(15) for SOCs.

(13) Waivers for SOCs ***only*** may be based entirely on vulnerability of the source water, if no sampling data are available.

(7) Systems which maintain a free chlorine residual throughout the distribution system in compliance with the Total Coliform Rule (TCR) may be granted susceptibility waivers for glyphosate and cyanide, but not for nitrite.

(8) States are encouraged to use implementation of the Wellhead Protection Program (WHPP)[14] as a prerequisite or foundation for considering sampling point vulnerability.

(9) States' initial experience with waivers has yielded the following tentative conclusions.

(a) Contaminants measured using the most expensive analytical methods are the best candidates for cost effective vulnerability analysis *i.e.*, dioxin, asbestos, cyanide, glyphosate and endothal.

(b) The least expensive strategy to States for ***developing*** a waiver program is to develop waiver application forms for individual water utilities to complete. However, this is likely to:

⇒ Impose higher costs upon water systems in conducting thorough vulnerability assessments;

⇒ Create higher State program operational costs in reviewing individual waiver applications;

⇒ Result in a lower percentage of approvable waiver applications, where State decision criteria is more stringent in the interest of protecting public health; or

⇒ Result in less soundly based waiver approvals, where State decision criteria is not so stringent in protecting public health.

(c) The most cost effective strategy for States consistent with a higher level of public health protection seems to be a shared effort, where the State does some of the data gathering and analyses up front, and then requests additional information from individual water systems that is otherwise not readily available *e.g.*, the State conducts general hydrogeological analyses based on data from USGS, USDA or academic centers, then the water systems surviving the hydro-geological cut conduct contamination site inventories.

(d) Use waivers are problematical in many States because VOCs are ubiquitous and State Department of Agriculture pesticide registration programs cannot provide adequate documentation of use patterns for waiver approval.

(e) The so called pineapple pesticide (DBCP) was registered for 43 crops before it was banned and remains in ground water supplies at levels above the MCL where it was used.[15]

COMPLIANCE DETERMINATION [16]

If a system samples ***more frequently than annually*** (*e.g.*, quarterly), the system would be in violation if the running annual average at any sampling point exceeds the MCL. If a system conducts sampling on an ***annual or less frequent*** basis, the system would be in violation if one sample (or the average of the initial and confirmation samples) at any sampling point exceeds the MCL.

PUBLIC NOTICE [17]

Any system violating an NPDWR (*i.e.*...an MCL or its monitoring requirements) must issue a public notice. For an MCL violation, systems must issue a notice that includes the mandatory health effects language for that chemical in §141.32. Systems must publish the notice in a newspaper within 14 days and deliver the notice to consumers within 45 days. For monitoring violations, systems must notify consumers through major newspapers within three months. Follow-up notices must be issued every three months for the duration of any violation. NTNCWSs have options of hand delivering or continuously posting public notices instead of using the newspapers and mailings.

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(14) This may become known as part of the Source Water Protection Program (SWPP) under an SDWA reauthorization proposal before Congress.

(15) Because of DBCP contamination in the ground water, the 'valley town' of Lodi, California cannot find new water supplies that will not require GAC treatment.

(16) For Compliance Determinations, see §§141.23(i) for IOCs, 141.24(f)(15) for VOCs and 141.24(h)(11) for SOCs.

(17) See §141.32.

ASBESTOS MONITORING

This section summarizes the monitoring requirements for asbestos as described in §141.23(b). Monitoring for asbestos begins between January 1, 1993 and December 31, 1995.

SAMPLING POINTS [see §§ 141.23(b)(5)-(7)]

If asbestos occurs in the source water, sampling must be conducted at each entry point to the distribution system, which is representative of the well or source water after treatment. Systems vulnerable to asbestos contamination ***within the distribution system***, from a combination of asbestos-cement pipe and source water corrosivity, shall sample at a tap served by asbestos-cement pipe under conditions where such contamination is likely to occur.

INITIAL SAMPLING [see § 141.23(b)(1)]

Between 1993 and 1995, all systems must take one sample at each sampling point, unless a waiver has been granted in writing by the state. Each system must sample at the time in the first compliance period designated by the State.

GRANDFATHERING [see § 141.23(b)(10)]

States may allow previous sampling data to satisfy the initial sampling requirements, provided the data were collected after January 1, 1990.

REPEAT SAMPLING [see § 141.23(b)(1)]

If results of the initial sample do not exceed the MCL, the system is not be required to take repeat samples until the first three years of the next nine-year compliance cycle.

INCREASED SAMPLING [see §§ 141.23(b)(8)-(9)]

Any system exceeding the MCL must begin quarterly sampling in the next quarter. The system must continue quarterly sampling until the State determines that it is reliably and consistently below the MCL, when the sampling frequency may be reduced to one sample every nine years.

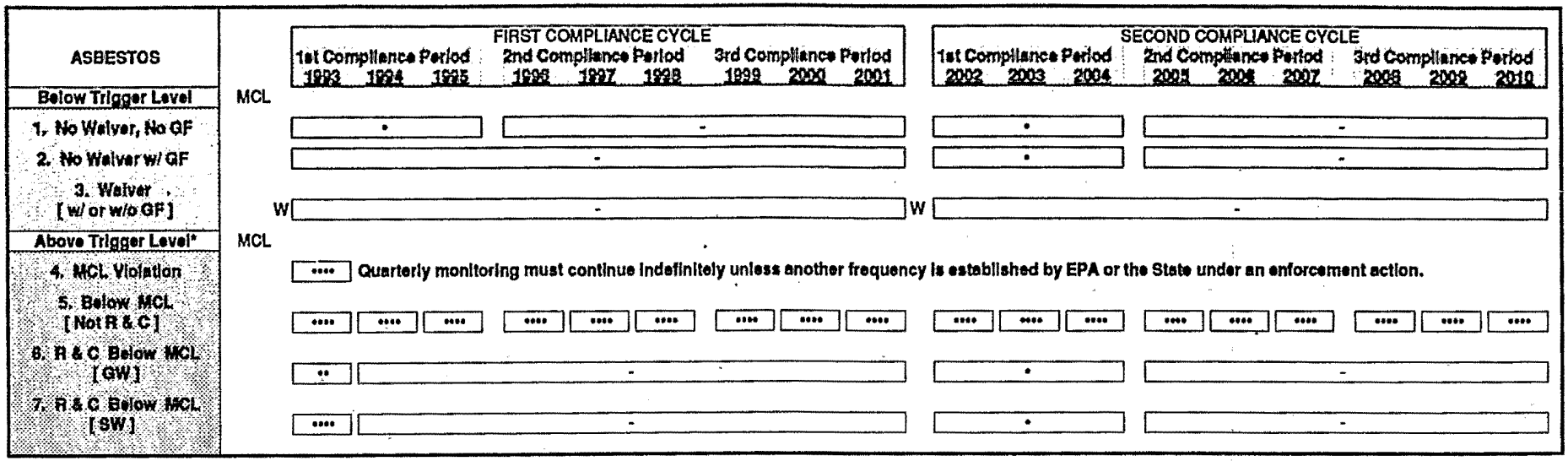
WAIVERS [see §§ 141.23(b)(2)-(4)]

States may issue ***waivers from source water sampling***, if they find the source water does not contain naturally occurring asbestos, and that it is unlikely to become contaminated with asbestos from human activity. States may also issue ***waivers from distribution system sampling***, if they find the water in the distribution system is not susceptible to asbestos contamination from the combination of asbestos-cement pipe and source water corrosivity *e.g.*, Langelier Index.

The sampling requirements are eliminated for each compliance cycle in which a State grants a waiver. Waivers are effective for one nine year compliance cycle. If a waiver is not renewed in the first compliance period of a nine-year compliance cycle, the system must sample before the end of that compliance period.

TABLE III

STANDARDIZED MONITORING FRAMEWOR K



Below Trigger Level	MCL
1. No Waiver, No GF	Sampling points in systems that do *NOT* "grandfather" prior sampling results and have never detected asbestos must take one sample during the first three-year compliance period of each nine-year compliance cycle.
2. No Waiver w/ GF	Sampling points in systems that do "grandfather" prior sampling results and have never detected asbestos may skip sampling in the first compliance cycle, but must take one sample during the first three-year compliance period of each nine-year compliance cycle.
3. Waiver [w/ or w/o GF]	Sampling points issued a waiver must sample at a frequency designated by the State in the waiver, which is valid for nine years.
Above Trigger Level*	MCL
4. MCL Violation	Sampling points in violation of the MCL must monitor every quarter unless and until the State or EPA allow reduced sampling under an enforcement action that establishes a revised and enforceable monitoring schedule.
5. Below MCL [No R & C]	Sampling points detecting asbestos, but which are *NOT* determined by the State to be "reliably and consistently" below the MCL, must continue monitoring quarterly as long as the sampling point is in use.
6. R & C Below MCL [GW]	Ground water sampling points detecting asbestos, but determined by the State to be "reliably and consistently" below the MCL, may reduce their monitoring frequency to one sample in the first compliance period of each compliance cycle. The State determination must be based on a minimum of two consecutive quarterly samples.
7. R & C Below MCL [SW]	Surface water sampling points detecting asbestos, but determined by the State to be "reliably and consistently" below the MCL, may reduce their monitoring frequency to one sample in the first compliance period of each compliance cycle. The State determination must be based on a minimum of four consecutive quarterly samples.

* A sampling point may exceed the trigger level at any time, so there is no practical place on the timeline to illustrate its effects on the sampling frequency. Therefore, this graphic assumes the trigger level is exceeded in the first quarter of 1993. The trigger level for asbestos is the MCL.

Key:
• = One Sample
R & C = Reliably and Consistently
W = Waiver
GW = Ground Water
SW = Surface Water
TNCWS = Transient Non-Community Water System
GF = Grandfathering of data. Depending on the availability of eligible data, systems can "grandfather" one or more of the samples required for base monitoring. The system's monitoring schedule is adjusted accordingly based on the number of samples that are "grandfathered."

NITRATE MONITORING

This section summarizes the revised monitoring requirements for nitrate as described in §141.23(d). The revised monitoring requirements for nitrate take effect on January 1, 1993.

INITIAL SAMPLING [see §§ 141.23(d)(1) and 141.23(d)(4)]

All water systems must begin complying with the revised sampling requirements for nitrate beginning January 1, 1993. For ***CWSs and NTNCWSs***, ground water sampling points must sample annually, and surface water sampling points must sample quarterly. All ***TNCWSs*** must sample annually.

GRANDFATHERING & WAIVERS - Not Allowed !!!

REPEAT SAMPLING [see §§ 141.23(d)(1) and 141.23(d)(3)-(5)]

These provisions apply to only water systems with nitrate concentrations less than ½ the MCL. For ***CWSs and NTNCWSs***, States may reduce the quarterly sampling of surface water points to an annual frequency, if the analytical results from four consecutive quarters are less than ½ the MCL (*i.e.*, 5 mg/l) - with the proviso that the samples must be taken during the calendar quarter yielding the highest analytical results. Ground water sampling points must continue sampling at an annual frequency. ***TNCWSs*** must continue annual sampling.

INCREASED SAMPLING [see §§ 141.23(d)(1)-(4)]

For ***CWSs and NTNCWSs***, any sampling point with analytical results ≥ ½ the MCL must begin quarterly sampling in the next calendar quarter. States may reduce the frequency to annual for ***ground water sampling points*** - if the results of four consecutive quarterly samples are reliably and consistently ***below the MCL***, and for ***surface water sampling points*** - if the analytical results of four consecutive quarters are ***less than ½ the MCL***. ***TNCWSs*** must continue annual sampling.

CONFIRMATION SAMPLES [see § 141.23(f)(2)]

If the analytical results from any sampling point are found to be ≥ the MCL, the water system must take a confirmation sample at the same point no later than 24 hours after receiving the results of the initial sample. Systems unable to meet the 24-hour requirement must issue a public notice to consumers of the system and complete the analysis of a confirmation sample within two weeks of receiving the results of the initial sample.

COMPLIANCE DETERMINATION [see § 141.23(i)(3)]

Compliance is determined by averaging the results of the initial and confirmation samples. Averaging the results of one quarter with those of prior or successive quarters is not permitted for nitrate.

PUBLIC NOTICE [see § 141.32]

Any water system violating the NPDWR (*i.e.*, MCL, monitoring and reporting requirements, etc.) for nitrate must give public notice.

For MCL violations, all ***CWSs*** must (1) give notice by electronic media (*e.g.*, TV, radio) within 72 hours, (2) publish a notice in the newspaper within 14 days, and (3) deliver a written notice to each consumer within 45 days. The notice must include the health effects language for nitrate in §141.32.

For monitoring violations, all ***CWSs*** must notify consumers by newspaper within three months. Follow-up notices must be issued every three months for the duration of any violation.

NTNCWSs and TNCWSs may post public notices, instead of using the delivery routes described above.

TABLE IV

STANDARDIZED MONITORING FRAMEWORK

NITRATE		FIRST COMPLIANCE CYCLE									SECOND COMPLIANCE CYCLE								
		1st Compliance Period			2nd Compliance Period			3rd Compliance Period			1st Compliance Period			2nd Compliance Period			3rd Compliance Period		
		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Below Trigger Level	1/2 MCL																		
1. Surface Water		••••	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2. GW & TNCSWs [No GF & No Waivers Allowed]		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Above Trigger Level*	1/2 MCL																		
3. MCL Violation		••••	Quarterly monitoring must continue indefinitely unless another frequency is established by EPA or the State under an enforcement action.																
4. Below MCL		••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••
5. R & C Below MCL [SW & GW]		••••	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Below Trigger Level	1/2 MCL	
1. Surface Water		Surface water sampling points must take a minimum of four consecutive quarterly samples in 1993. The State may reduce this to an annual frequency, if all analytical results are less than 1/2 of the MCL, provided that the annual sample is taken in the quarter yielding the highest analytical results.
2. GW & TNCWSs [No GF & No Waivers Allowed]		Ground water and transient PWS sampling points must take one sample during each compliance year as long as the analytical results are less than 1/2 of the MCL.
Above Trigger Level*	1/2 MCL	
3. MCL Violation		Sampling points in violation of the MCL must monitor every quarter unless and until the State or EPA allow reduced sampling under an enforcement action that establishes a revised and enforceable monitoring schedule.
4. Below MCL		Sampling points detecting nitrate at 1/2 the MCL or greater, but which are *NOT* determined by the State to be "reliably and consistently" below the MCL, must continue monitoring quarterly as long as the sampling point is in use.
5. R & C Below MCL [SW & GW]		Sampling points detecting nitrate at 1/2 the MCL or greater and determined by the State to be "reliably and consistently" below the MCL may reduce their monitoring frequency to one sample every year. The State determination must be based on a minimum of four consecutive quarterly samples.

* A sampling point may exceed the trigger level at any time, so there is no practical place on the timeline to illustrate its effects on the sampling frequency. Therefore, this graphic assumes the trigger level is exceeded in the first quarter of 1993. The trigger level for nitrate is half the MCL.

Key:
• = One Sample
R & C = Reliably and Consistently
W = Waiver
GW = Ground Water
SW = Surface Water
TNCWS = Transient Non-Community Water System
GF = Grandfathering of data: Depending on the availability of eligible data, systems can "grandfather" one or more of the samples required for base monitoring. The system's monitoring schedule is adjusted accordingly based on the number of samples that are "grandfathered."

NITRITE MONITORING

This section summarizes the monitoring requirements for nitrite as described in §141.23(e). Monitoring for nitrite begins on January 1, 1993.

SYSTEMS AFFECTED [see § 141.23(e)]

All CWSs, NTNCWSs and TNCWSs must comply with the monitoring requirements for nitrite.

INITIAL SAMPLING [see § 141.23(e)(1)]

Between 1993 and 1995, each system must take one sample at the time designated by the State.

GRANDFATHERING & WAIVERS - Not Allowed !!!

REPEAT SAMPLING [see § 141.23(e)(2)]

If the results of initial sampling are ***less than ½ the MCL***, repeat sampling requirements (if any) will be at state discretion.

INCREASED SAMPLING [see §§ 141.23(e)(3)-(4)]

If the analytical results from any sampling point are ≥ ***½ the MCL***, the water system must sample quarterly for at least one year. If the results of four consecutive quarterly samples are reliably and consistently below the MCL, the State may reduce the frequency to annual sampling - with the proviso that the samples must be taken during the calendar quarter yielding the highest analytical results.

CONFIRMATION SAMPLES [see § 141.23(f)(2)]

Systems must take a confirmation sample no later than 24 hours after the results of a sample are found to be ≥ the MCL. Systems unable to meet the 24-hour requirement must issue a public notice to consumers of the system and complete the analysis of a confirmation sample within two weeks of receiving the results of the initial sample.

COMPLIANCE DETERMINATION [see § 141.23(i)(3)]

Compliance is determined by averaging the results of the initial and confirmation samples. Averaging the results of one quarter with those of prior or successive quarters is not permitted for nitrate.

PUBLIC NOTICE [see § 141.32]

Any water system violating the NPDWR (*i.e.*, MCL, monitoring and reporting requirements, etc.) for nitrite must give public notice.

For MCL violations, all ***CWSs*** must (1) give notice by electronic media (*e.g.*, TV, radio) within 72 hours, (2) publish a notice in the newspaper within 14 days, and (3) deliver a written notice to each consumer within 45 days. The notice must include the mandatory health effects language for nitrate in §141.32.

For monitoring violations, all ***CWSs*** must notify consumers by newspaper within three months. Follow-up notices must be issued every three months for the duration of any violation.

NTNCWSs and TNCWSs may post public notices, instead of using the delivery routes described above.

TABLE V

STANDARDIZED MONITORING FRAMEWOR K

NITRITE		FIRST COMPLIANCE CYCLE									SECOND COMPLIANCE CYCLE								
		1st Compliance Period			2nd Compliance Period			3rd Compliance Period			1st Compliance Period			2nd Compliance Period			3rd Compliance Period		
		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Below Trigger Level	1/2 MCL																		
1. All Systems [No GF & No Wavlers Allowed]		•			-						-								
Above Trigger Level*	1/2 MCL																		
2. MCL Violation		••••	Quarterly monitoring must continue indefinitely unless another frequency is established by EPA or the State under an enforcement action.																
3. Below MCL		••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••
4. R & C Below MCL [SW & GW]		••••	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Below Trigger Level	1/2 MCL	
1. All Systems [No GF & No Wavlers Allowed]		During the first compliance period, each sampling point in a system must take one sample at the time designated by the State. If the results of the initial sampling are less than 1/2 of the MCL, repeat sampling requirements (if any) will be at the discretion of the State. If the results of the initial sampling are equal to or greater than 1/2 of the MCL, the system must take quarterly samples for at least one year.
Above Trigger Level*	1/2 MCL	
2. MCL Violation		Sampling points in violation of the MCL must monitor every quarter unless and until the State or EPA allow reduced sampling under an enforcement action that establishes a revised and enforceable monitoring schedule.
3. Below MCL		Sampling points detecting nitrite at 1/2 the MCL or greater, but which are *NOT* determined by the State to be "reliably and consistently" below the MCL, must continue monitoring quarterly as long as the sampling point is in use.
4. R & C Below MCL [SW & GW]		Sampling points detecting nitrite at 1/2 the MCL or greater and determined by the State to be "reliably and consistently" below the MCL may reduce their monitoring frequency to one sample every year. The State determination must be based on a minimum of four consecutive quarterly samples.

* A sampling point may exceed the trigger level at any time, so there is no practical place on the timeline to illustrate its effects on the sampling frequency. Therefore, this graphic assumes the trigger level is exceeded in the first quarter of 1993. The trigger level for nitrite is half the MCL.

Key:
• = One Sample
R & C = Reliably and Consistently
W = Waiver
GW = Ground Water
SW = Surface Water
TNCWS = Transient Non-Community Water System
GF = Grandfathering of data. Depending on the availability of eligible data, systems can "grandfather" one or more of the samples required for base monitoring. The system's monitoring schedule is adjusted accordingly based on the number of samples that are "grandfathered."

INORGANIC COMPOUNDS (IOCs)

INTRODUCTION

This section summarizes the monitoring requirements for IOCs as described in §141.23(c). The IOCs regulated under Phases II and IIB for purposes of monitoring requirements are barium, cadmium, chromium, fluoride, mercury, and selenium. The IOCs regulated under Phase V are antimony, beryllium, cyanide, nickel and thallium.

INITIAL SAMPLING [see § 141.23(c)(1)]

For all CWSs and NTNCWSs, the initial monitoring for IOCs under Phases II and IIB begins in the compliance period of 1993-1995. For ***CWSs and NTNCWSs serving ≥ 150 service connections***, the initial monitoring for IOCs regulated under Phase V also begins in the compliance period of 1993-1995. For CWSs and NTNCWSs serving ***less than 150 service connections***, the initial monitoring for IOCs regulated under Phase V begins in the compliance period of 1996-1998.

Ground water systems must take one sample at each sampling point during the initial three year compliance period. ***Surface water systems*** must take one sample annually at each sampling point during the initial compliance period.

REPEAT SAMPLING [see § 141.23(c)(1)]

Repeat sampling requirements are the same as those for the initial sampling, *i.e.*..one sample per three-year compliance period for ground water and one sample each year for surface water systems.

INCREASED SAMPLING [see § 141.23(c)(7)]

If the analytical results from any sampling point are ≥ the MCL, the water system must begin sampling quarterly at that point in the next calendar quarter and continue sampling quarterly, until the State determines that it is reliably and consistently below the MCL.

WAIVERS [see §§ 141.23(c)(2)-(6)]

States may reduce the sampling frequency for any of these contaminants to one sample every nine years, by issuing a waiver that is effective for that period. In order to qualify for a waiver, a sampling point must have three previous samples including one taken after January 1, 1990 [see §141.23(c)(4)], and all previous analytical results must be below the MCL.

These waiver determinations must consider: (1) all previous monitoring data; (2) the variation in reported concentrations, and (3) other factors affecting concentrations (*e.g.*, changes in pumping rates, in system configuration or operating procedures, or in stream flows or characteristics). The State should also consider quality and amount of data available, the length of time covered and the volatility/stability of the sampling results, and the proximity of the results to the MCL.

An ***IOC*** waiver does not mean the water supply is uncontaminated with that chemical [see §141.23(c)(5)]. It means that whether or not the source water is contaminated, the water delivered to consumers is at a concentration sufficiently below the MCL, that it is expected to remain so.

If a State finds the sampling point is very unlikely to violate the MCLs of the IOCs under review during the term of the waiver, it may issue a waiver. If the State cannot make this finding, it should not issue a waiver. IOC waivers must be renewed every nine years.

TABLE VI

STANDARDIZED MONITORING FRAMEWORK

IOCs		FIRST COMPLIANCE CYCLE									SECOND COMPLIANCE CYCLE								
		1st Compliance Period			2nd Compliance Period			3rd Compliance Period			1st Compliance Period			2nd Compliance Period			3rd Compliance Period		
		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Below Trigger Level	MCL																		
Ground Water																			
1. No Waiver, No GF		•			•			•			•			•			•		
2. No Waiver, GF		-			•			•			•			•			•		
3. Waiver, No GF [3 Samples]		•			•			•		W	•								
4. Waiver, GF	W				•					W	•								
Surface Water																			
5. No Waiver, No GF		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
6. No Waiver, GF		-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
7. Waiver, No GF [3 Annual Samples]		•	•	•	W			•			W	9 Year Waiver					•		
8. Waiver, GF	W				•					W	•								
Above Trigger Level*	MCL																		
9. MCL Violation		••••	Quarterly monitoring must continue indefinitely unless another frequency is established by EPA or the State under an enforcement action.																
10. Below MCL		••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••
11. R & C Below MCL [GW]		••	-		•			•			•			•			•		
12. R & C Below MCL [SW]		••••	-		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

TABLE VI [continued]

IOCs	
Below Trigger Level	MCL
	Sampling points that detect an IOC during any of the following scenarios will fall under one of the scenarios at the bottom of the page (Above Trigger Level) in the next calendar quarter.
Ground Water	
1. No Waiver, No GF	Sampling points in systems that do *NOT* "grandfather" prior sampling results must take one sample during the initial compliance period and then one sample in each succeeding compliance period.
2. No Waiver, GF	Sampling points in systems that do "grandfather" prior sampling results and have never exceeded the MCL may skip sampling in the first compliance period, but must take one sample in each succeeding compliance period.
3. Waiver, No GF [3 Samples]	Sampling points in systems that are issued a waiver and that do *NOT* "grandfather" must sample once every three-year compliance period during the first nine-year compliance cycle. Once a waiver is issued, the system must take at least one sample during each nine-year waiver period.
4. Waiver, GF	Sampling points that use "grandfathered" data as a basis for a waiver must take at least one sample during each nine-year waiver period.
Surface Water	
5. No Waiver, No GF	Sampling points in systems that do *NOT* "grandfather" prior sampling results must take one sample each year.
6. No Waiver, GF	Sampling points in systems that do "grandfather" prior sampling results and have never exceeded the MCL may skip sampling in the first year, but must take one sample in each subsequent year.
7. Waiver, No GF [3 Annual Samples]	Sampling points in systems that do *NOT* "grandfather" must sample once every year during the first compliance period to qualify for a waiver. Once a waiver is issued, the system must take at least one sample during each nine-year waiver period.
8. Waiver, GF	Sampling points that use "grandfathered" data as the basis for a waiver must take at least one sample during each nine-year waiver period.
Above Trigger Level*	MCL
9. MCL Violation	Sampling points in violation of the MCL must monitor every quarter unless and until the State or EPA allow reduced sampling under an enforcement action that establishes a revised and enforceable monitoring schedule.
10. Below MCL [Not R & C]	Sampling points initially exceeding the MCL and subsequently detecting at less than the MCL, but which are *NOT* determined by the State to be "reliably and consistently" below the MCL, must continue monitoring quarterly as long as the sampling point is in use.
11. R & C Below MCL [GW]	Ground water sampling points initially exceeding the MCL and subsequently detecing at less than the MCL and determined by the State to be "reliably and consistently" below the MCL may reduce their monitoring frequency to one sample every three years. The State determination must be based on a minimum of two consecutive quarterly samples below the MCL. Sampling points with three consecutive rounds of monitoring with no detection may apply to the State for a waiver.
12. R & C Below MCL [SW]	Surface water sampling points initially exceeding the MCL and subsequently detecting at less than the MCL and determined by the State to be "reliably and consistently" below the MCL may reduce their monitoring frequency to annually. The State determination must be based on a minimum of four consecutive quarterly samples below the MCL. Sampling points with three consecutive years of no detection may apply to the State for a waiver.

* A sampling point may exceed the trigger level at any time, so there is no practical place on the timeline to illustrate its effects on the sampling frequency. Therefore, this graphic assumes the trigger level is exceeded in the first quarter of 1993. The trigger level for IOCs is the MCL.

Note: All Community and Non-Transient, Non-Community water systems serving less than 150 service connections will receive a three-year extension from the initial monitoring requirements of IOCs regulated under Phase V. The initial monitoring will begin in the compliance period of 1996-1998.

Key:
• = One Sample
R & C = Reliably and Consistently
W = Waiver
GW = Ground Water
SW = Surface Water
TNCWS = Transient Non-Community Water System
GF = Grandfathering of data. Depending on the availability of eligible data, systems can "grandfather" one or more of the samples required for base monitoring. The system's monitoring schedule is adjusted accordingly based on the number of samples that are "grandfathered."

VOLATILE ORGANIC COMPOUNDS (VOCs)

INTRODUCTION

This section summarizes the monitoring requirements for VOCs as described in §141.24(f). The VOCs regulated under Phases II and IIB for purposes of monitoring requirements, as well as those regulated under Phase V, are listed in Table I.

INITIAL SAMPLING [see § 141.24(f)(4)]

For all CWSs and NTNCWSs, the initial monitoring for VOCs under Phases II and IIB begins in the compliance period of 1993-1995. For ***CWSs and NTNCWSs serving ≥ 150 service connections***, the initial monitoring for VOCs regulated under Phase V also begins in the compliance period of 1993-1995. For CWSs and NTNCWSs serving ***less than 150 service connections***, the initial monitoring for VOCs regulated under Phase V begins in the compliance period of 1996-1998.

All systems must take four consecutive quarterly samples in the initial compliance period, unless there are prior sampling results that may be 'grandfathered' for this requirement. Under §142.16(e)(2), States must designate the year in which each system will complete its initial sampling. Water systems are required under §141.24(f)(21) to sample "...at the time designated by the State...".

The same general provisions apply to contaminants regulated under Phase V and systems serving less than 150 service connections, ***except that there are no provisions for grandfathering data into that compliance period.***

GRANDFATHERING [see §§ 141.24(f)(5) and 141.24(f)(18)]

States may allow previous sampling data collected between January 1, 1988 and December 31, 1992 to satisfy the initial quarterly sampling requirements scheduled for the 1993-1995 compliance period. If the system did not detect any VOCs, the system shall begin annual sampling in 1993. States should accept only 'worst case' data from surface water sampling points as a substitute for the initial sampling requirements.[18]

REPEAT SAMPLING [see § 141.24(f)(5)]

If no VOCs are detected during the initial round of sampling, States may allow systems to decrease their sampling frequency beginning in the second compliance period.

(1) ***Ground water systems*** must take at least one sample each year at each sampling point. After three years of annual sampling with no detection, sampling at that point may be further reduced to one sample every three years [see §141.24(f)(6)]. States may count the initial year of quarterly sampling as one of the three years of no detection.

(2) ***Surface water systems*** must sample annually [see §141.24(f)(5)].

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(18) If one surface water sample was taken in the middle of February at 28° F, it may not be very representative of spring time runoff.

INCREASED SAMPLING [see §§ 141.24(f)(11) and 141.24(f)(19)]

If a sampling point exceeds the method detection limit (MDL) of .0005 mg/l for any VOC, the water system must begin quarterly sampling at that point in the next calendar quarter and must continue sampling quarterly, until the State determines the sampling point is reliably and consistently below the MCL.

RELIABLY & CONSISTENTLY BELOW THE MCL [see §§ 141.24(f)(11)-(12)]

A State may determine that a sampling point is reliably and consistently below the MCL, after analyzing a sufficient amount of information to establish a meaningful trend. This means a minimum of two quarters of data for groundwater systems and four quarters for surface water systems.

However, if the detection triggering increased sampling ***exceeds the MCL***, the sampling point must take a ***minimum of four consecutive quarterly samples*** to establish a meaningful trend, regardless of whether it's served by ***groundwater*** or ***surface water*** [see §141.24(f)(12)].

If a State cannot predict that the sampling point will remain below the MCL using this minimal data set, it should continue collecting quarterly data until it can make such a prediction.

After a State determines the sampling point is reliably and consistently below the MCL, it may reduce the sampling frequency to one sample every year - with the proviso that the repeat sampling must be conducted during the calendar quarter which previously yielded the highest analytical result [see §141.24(f)(11)(iii)].

WAIVERS [see §§ 141.24(f)(7)-(10)]

Systems may not receive a waiver from the initial sampling requirements but may apply for a waiver from the repeat sampling requirements, if (a) the contaminant was not detected during the initial sampling period, or in the 'grandfathered' sampling results, or (b) the contaminant has not been detected for three consecutive years of annual sampling.

(1) A state may grant a use waiver after determining the contaminant has not been used in the water supply area (*i.e.*, the contaminant was not used, manufactured, stored or disposed). Systems ineligible for a use waiver may apply for a waiver based on susceptibility.

(2) A state may grant a susceptibility waiver after reviewing the results of a thorough vulnerability assessment, which includes all prior sampling results and an evaluation of the source water susceptibility to contamination. This evaluation must include the environmental persistence and transport of the contaminant(s) under review, how well the sourcewater is protected by geology and well design, and proximity of potential contamination sites. The evaluation should also include the sampling results of neighboring systems, any Wellhead Protection Assessments that have been completed, and any contamination controls that have been implemented.

(3) The maximum waiver period for ***ground water*** sampling points is six years. The initial waiver ***must be renewed*** within the first three years of issuance, but subsequent waivers may be renewed at the end of the six year period. At least one sample must be taken during each six year waiver period [see §141.24(f)(10)].

(4) The maximum waiver period for ***surface water*** sampling points is only three years, but there is no minimum Federal sampling frequency.

TABLE VII

STANDARDIZED MONITORING FRAMEWORK

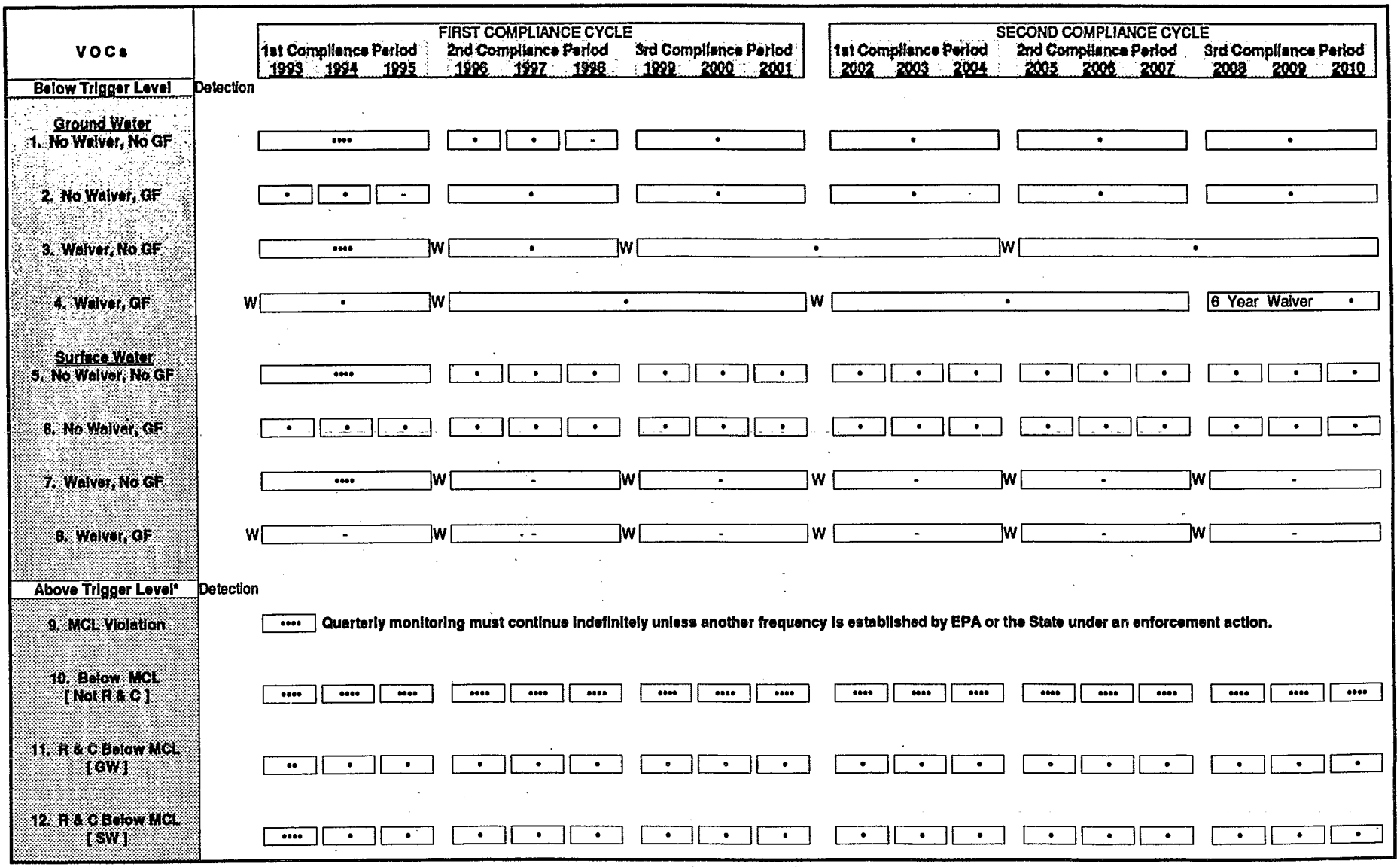

TABLE VII [continued]

VOCs	
Below Trigger Level	Detection
	Sampling points that detect a VOC during any of the following scenarios will fall under one of the scenarios at the bottom of the page (Above Trigger Level) in the next calendar quarter.
Ground Water	
1. No Waiver, No GF	Sampling points in systems that do *NOT* "grandfather" prior sampling results must take four consecutive quarterly samples during the initial compliance period as scheduled by the State. In the second compliance period, the system must take one sample in each of the first two years. The State may count the initial year of quarterly sampling as one of the three years of no detection. So, no annual sample is required in the third year. The system must then take one sample in each succeeding compliance period.
2. No Waiver, GF	Sampling points in systems that do "grandfather" prior sampling results and have never detected a VOC must take one sample in each of the first two years during the initial compliance period. If the State counts the grandfathered data as one of the years of no detection, no sample is required in the third year. The system must then take one sample in each succeeding compliance period.
3. Waiver, No GF	Sampling points in systems that do *NOT* "grandfather" must take four consecutive quarterly samples during the initial compliance period as scheduled by the State before the State can issue a waiver. Once a waiver is issued, the system must take one sample in the following compliance period and at least one sample during each six-year waiver period.
4. Waiver, GF	Sampling points that do grandfather prior sampling results and are issued a waiver must sample once in the first compliance period and then at least once during each six-year waiver period.
Surface Water	
5. No Waiver, No GF	Sampling points in systems that do *NOT* "grandfather" prior sampling results must take four consecutive quarterly samples during the initial compliance period as scheduled by the State and then one sample each year.
6. No Waiver, GF	Sampling points in systems that do "grandfather" prior sampling results and have never detected a VOC must take one sample each year.
7. Waiver, No GF	Sampling points in systems that do *NOT* "grandfather" must take four consecutive quarterly samples during the first compliance period as scheduled by the State before the State can issue a waiver. Once a waiver is issued, the system must sample at a frequency specified by the State in each three-year waiver.
8. Waiver, GF	Sampling points that do grandfather prior sampling results and are issued a waiver must sample at a frequency designated by the State, in the waiver.
Above Trigger Level	Detection
9. MCL Violation	Sampling points in violation of the MCL must monitor every quarter unless and until the State or EPA allow reduced sampling under an enforcement action that establishes a revised and enforceable monitoring schedule.
10. Below MCL [Not R & C]	Sampling points detecting a VOC, but which are *NOT* determined by the State to be "reliably and consistently" below the MCL, must continue monitoring quarterly as long as the sampling point is in use.
11. R & C Below MCL [GW]	Ground water sampling points detecting a VOC, but determined by the State to be "reliably and consistently" below the MCL, may reduce their monitoring frequency to one sample every year. The State determination must be based on a minimum of two consecutive quarterly samples below the MCL. Sampling points with three consecutive years of no detection may apply to the State for a waiver.
12. R & C Below MCL [SW]	Surface water sampling points detecting a VOC, but determined by the State to be "reliably and consistently" below the MCL, may reduce their monitoring frequency to one sample every year. The State determination must be based on a minimum of four consecutive quarterly samples below the MCL. Sampling points with three consecutive years of no detection may apply to the State for a waiver.

* A sampling point may exceed the trigger level at any time, so there is no practical place on the timeline to illustrate its effects on the sampling frequency. Therefore, this graphic assumes the trigger level is exceeded in the first quarter of 1993. The trigger level for VOCs is the detection level.

Note: All Community and Non-Transient, Non-Community water systems serving less than 150 service connections will receive a three-year extension from the initial monitoring requirements of VOCs regulated under Phase V. The initial monitoring will begin in the compliance period of 1996-1998.

Key:
• = One Sample
R & C = Reliably and Consistently
W = Waiver
GW = Ground Water
SW = Surface Water
TNCWS = Transient Non-Community Water System
GF = Grandfathering of data. Depending on the availability of eligible data, systems can "grandfather" one or more of the samples required for base monitoring. The system's monitoring schedule is adjusted accordingly based on the number of samples that are "grandfathered."

SYNTHETIC ORGANIC COMPOUNDS (SOCs)

INTRODUCTION

This section summarizes the monitoring requirements for SOCs as described in §141.24(h). The SOCs regulated under Phases II and IIB for purposes of monitoring requirements, as well as the contaminants regulated under Phase V, are listed in Table I.

INITIAL SAMPLING [see § 141.24(h)(4)(i)]

For all CWSs and NTNCWSs, the initial monitoring for SOCs regulated under Phases II and IIB begin in the compliance period of 1993-1995. For ***CWSs and NTNCWSs serving ≥ 150 service connections***, the initial monitoring for SOCs regulated under Phase V also begins in the compliance period of 1993-1995. For CWSs and NTNCWSs serving ***less than 150 service connections***, the initial monitoring for SOCs regulated under Phase V begins in the compliance period of 1996-1998.

All systems must take an initial round of four consecutive quarterly samples during the initial compliance period, unless a waiver has been granted in writing by the state. The State will designate the year in which each water system is scheduled to sample.

GRANDFATHERING [see § 141.24(h)(14)]

States may allow sampling data collected after January 1, 1990 to satisfy the initial base sampling requirements, if the data "are generally consistent with the requirements of §141.24(h)". States should accept only 'worst case' data from surface water sampling points in substitution for the initial sampling requirements.

REPEAT SAMPLING [see § 141.24(h)(4)]

States may allow systems to decrease their sampling frequency in the second and subsequent compliance periods for contaminants undetected during the initial compliance period.

(1) Systems serving ***more than 3,300 people*** may reduce their sampling frequency to two samples every 3 years.

(2) Systems serving ***≤ 3,300 people*** may reduce their sampling to one sample every three years.

INCREASED SAMPLING [see §§ 141.24(h)(7)-(8) and 141.24(h)(15)]

If a contaminant is detected at any sampling point, the water system must begin sampling quarterly at that sampling point in the next quarter and continue sampling quarterly, until the State determines that the sampling point is reliably and consistently below the MCL.

RELIABLY & CONSISTENTLY BELOW THE MCL [see §§ 141.24(h)(7)-(8)]

A State may determine that a sampling point is reliably and consistently below the MCL, after analyzing a sufficient amount of information to establish a meaningful trend. This means a minimum of two quarters of data for groundwater systems and four quarters of data for surface water systems.

However, if the detection triggering increased sampling ***exceeds the MCL***, the sampling point must take a ***minimum of four consecutive quarterly samples*** to establish a meaningful trend, regardless of whether it's served by ***groundwater*** or ***surface water*** [see §141.24(h)(8)].

If a State cannot predict that the sampling point will remain below the MCL using this minimal data base, it should continue collecting quarterly data until it can make such a prediction.

After a State determines the sampling point is reliably and consistently below the MCL, it may reduce the sampling frequency to one sample every year - with the proviso that the repeat sampling must be conducted during the calendar quarter which previously yielded the highest analytical result [see §141.24(h)(7)(iii)].

WAIVERS [see §§ 141.24(h)(5)-(6) and 141.24(h)(7)(iv)]:

Systems may be eligible for waivers from the sampling requirements based entirely on the vulnerability of their source water to contamination, ***even if no sampling has ever been conducted.*** If sampling has been conducted, systems may apply for a waiver from the repeat sampling requirements, (a) if the contaminant was not detected at all, or (b) if the contaminant was detected at one time, but has not been detected for three consecutive years of annual sampling.

(1) Waivers are effective for one compliance period (3 years) and must be renewed in each subsequent compliance period, or the system must return to the repeat sampling frequency based on its size and circumstances.

(2) Systems receiving a waiver are not required to sample under Federal regulations.

(3) When a system demonstrates that a contaminant has not been used in the water supply area (*i.e.*, the contaminant was not used, manufactured, stored or disposed in the area), the system may apply to the state for a use waiver. Systems not eligible for use waivers may still qualify for a waiver by evaluating susceptibility of their source water to contamination.

(4) A state may grant a susceptibility waiver after reviewing the results of a thorough vulnerability assessment, which includes all prior sampling results and an evaluation of the source water susceptibility to contamination. This evaluation must include the environmental persistence and transport of the contaminant(s) under review, how well the source water is protected by geology and well design, and proximity of potential contamination sites and activities. The evaluation should also include the sampling results of neighboring systems and any Wellhead Protection Assessments that have been completed.

(5) States should design their waiver strategies ***in part*** around the analytical methods matrix in Table X (p.19). For multi-analyte methods like 515, 525 and 531, it may not pay to conduct vulnerability assessments for some of the contaminants unless there is a reasonable probability that a waiver can be granted for all of them.

(6) In States with few facilities that use dioxin, it may be practical to grant state-wide waivers excepting those water systems within a specified proximity to such facilities. The excepted systems should be identified by name and notified in writing that they are required to monitor.

TABLE VIII

STANDARDIZED MONITORING FRAMEWOR K

SOCs		FIRST COMPLIANCE CYCLE									SECOND COMPLIANCE CYCLE								
		1st Compliance Period			2nd Compliance Period			3rd Compliance Period			1st Compliance Period			2nd Compliance Period			3rd Compliance Period		
		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Below Trigger Level	Detection																		
Population >3,300																			
1. No Waiver, No GF		••••			••			••			••			••			••		
2. No Waiver, GF		-			••			••			••			••			••		
Population <3,300																			
3. No Waiver, No GF		••••			•			•			•			•			•		
4. No Waiver, GF		-			•			•			•			•			•		
All Systems																			
5. Waiver w/ OR w/o GF	W	-			W -			W -			W -			W -			W -		
Above Trigger Level*	Detection																		
6. MCL Violation	••••	Quarterly monitoring must continue indefinitely unless another frequency is established by EPA or the State under an enforcement action.																	
7. Below MCL [Not R & C]		••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••
8. R & C Below MCL [GW]		••	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
9. R & C Below MCL [SW]		••••	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

TABLE VIII [continued]

SOCs	
Below Trigger Level	Detection
	Sampling points that detect an SOC during any of the following scenarios will fall under one of the scenarios at the bottom of the page (Above Trigger Level) in the next calendar quarter.
Population >3,300	
1. No Waiver, No GF	Sampling points in systems serving more than 3,300 people that do *NOT* "grandfather" prior sampling results must take four consecutive quarterly samples during the initial compliance period as scheduled by the State and then two samples in each succeeding compliance period.
2. No Waiver, GF	Sampling points in systems serving more than 3,300 people that do "grandfather" prior sampling results and have never detected an SOC must take two samples in each compliance period.
Population <3,300	
3. No Waiver, No GF	Sampling points in systems serving 3,300 people or less that do *NOT* "grandfather" prior sampling results must take four consecutive quarterly samples during the initial compliance period and then one sample during each succeeding compliance period.
4. No Waiver, GF	Sampling points in systems serving 3,300 people or less that do "grandfather" prior sampling results and have never detected an SOC must take one sample in each compliance period.
All Systems	
5. Waiver w/ OR w/o GF	Sampling points issued a waiver must sample at a frequency designated by the State in the waiver, which is valid for three years.
Above Trigger Level*	Detection
6. MCL Violation	Sampling points in violation of the MCL must monitor every quarter unless and until the State or EPA allow reduced sampling under an enforcement action that establishes a revised and enforceable monitoring schedule.
7. Below MCL [Not R & C]	Sampling points detecting an SOC, but which are *NOT* determined by the State to be "reliably and consistently" below the MCL, must continue monitoring quarterly as long as the sampling point is in use.
8. R & C Below MCL [GW]	Ground water sampling points detecting an SOC, but determined by the State to be "reliably and consistently" below the MCL, may reduce their monitoring frequency to one sample every year. The State determination must be based on a minimum of two consecutive quarterly samples below the MCL. Sampling points with three consecutive years of no detection may apply to the State for a waiver.
9. R & C Below MCL [SW]	Surface water sampling points detecting an SOC, but determined by the State to be "reliably and consistently" below the MCL, may reduce their monitoring frequency to one sample every year. The State determination must be based on a minimum of four consecutive quarterly samples below the MCL. Sampling points with three consecutive years of no detection may apply to the State for a waiver.

* A sampling point may exceed the trigger level at any time, so there is no practical place on the timeline to illustrate its effects on the sampling frequency. Therefore, this graphic assumes the trigger level is exceeded in the first quarter of 1993. The trigger level for SOCs is the detection level.

Note: All Community and Non-Transient, Non-Community water systems serving less than 150 service connections will receive a three-year extension from the initial monitoring requirements of SOCs regulated under Phase V. The initial monitoring will begin in the compliance period of 1996-1998.

Key:
• = One Sample
R & C = Reliably and Consistently
W = Waiver
GW = Ground Water
SW = Surface Water
TNCWS = Transient Non-Community Water System
GF = Grandfathering of data. Depending on the availability of eligible data, systems can "grandfather" one or more of the samples required for base monitoring. The system's monitoring schedule is adjusted accordingly based on the number of samples that are "grandfathered."

UNREGULATED CONTAMINANT MONITORING

INTRODUCTION

This section summarizes the monitoring requirements as described in §141.40. There are 33 unregulated contaminants which can be divided into two groups. The VOCs are listed in §141.40(e). The group of SOCs include three aldicarbs that were administratively stayed under 57 FR 22178, May 27, 1992. One inorganic contaminant is listed in §141.40(n). The contaminants originally listed in §§141.40(e) and 141.40(n), which are now regulated, have been deleted from these subsections. These changes in the lists of unregulated contaminants were promulgated under the Phase V Rule [57 FR 31845, July 17, 1992].

UNREGULATED CONTAMINANT MONITORING UNDER PHASE I [§§141.40(a)-(e)]

SYSTEMS AFFECTED

All CWSs and NTNCWSs serving 150 service connections or more were required to have completed monitoring for the original list of 36 unregulated contaminants in subsection (e) by December 31, 1991. The remaining unregulated VOCs for which monitoring must still be conducted are listed below.

Unregulated Contaminants (VOCs) in 40 CFR § 141.40(e)	
Chloroform	Chloromethane
Bromodichloromethane	Bromomethane
Chlorodibromomethane	1,2,3-Trichloropropane
Bromoform	1,1,1,2-Tetrachlorethane
Dibromomethane	Chloroethane
m-Dichlorobenzene	2,2-Dichloropropane
1,1-Dichloropropene	o-Chlorotoluene
1,1-Dichloroethane	p-Chlorotoluene
1,1,2,2-Tetrachloroethane	1,3-Dichloropropene
1,3-Dichloropropane	Bromobenzene

INITIAL SAMPLING [see §§ 141.40(a)-(c)]

Surface water systems were required to take four quarterly samples, and ground water systems one sample, in 1988, 1989 or 1991, depending on the size of the populations served.

REPEAT SAMPLING [see §141.40(l)]

All CWSs and NTNCWSs must repeat the sampling required under §§141.40(b)-(c) every five years from the year the system had to begin monitoring under §141.40(a).

UNREGULATED CONTAMINANT MONITORING UNDER PHASE II
[§ 141.40(n)]

SYSTEMS AFFECTED

All CWSs and NTNCWSs serving ≥ 150 service connections must complete monitoring for the remaining unregulated contaminants by December 31, 1995.

Unregulated Contaminants in 40 CFR § 141.40(n)		
Organic	Aldicarb	Dicamba
	Aldicarb Sulfoxide	Dieldrin
	Aldicarb Sulfone	3-Hydroxycarbofuran
	Aldrin	Methomyl
	Butachlor	Metolachlor
	Carbaryl	Metribuzin
		Propachlor
Inorganic	Sulfate	

SAMPLING REQUIREMENTS

All systems serving ≥ 150 service connections are required to sample, unless a waiver has been granted by the State. Systems serving less than 150 service connections may satisfy their obligation for unregulated contaminant monitoring by sending the State a letter indicating the system is available for sampling. This letter must be sent to the state by January 1, 1994.

(1) Systems must take four consecutive quarterly samples for the 10 organic compounds.

(2) For sulfate, systems must take one sample.

REPEAT SAMPLING

All systems must repeat the sampling required in §141.40(n) no less frequently than every five years from the year the system began monitoring.

WAIVERS

Sampling for unregulated contaminants is not required for systems that have received a written waiver from the State.

(1) **Waiver for Organics:** When a system can demonstrate that a contaminant has not been used in the water supply area, *i.e.*...the contaminant was not used, manufactured, stored or disposed in the area), the system may apply to the state for a use waiver. Systems not eligible for use waivers may still qualify for a waiver by evaluating susceptibility of their source water to contamination. A state may grant a susceptibility waiver after reviewing the results of a thorough vulnerability assessment, which includes all prior sampling results and an evaluation of the source water susceptibility to contamination. This evaluation must include the sampling results of neighboring systems, the environmental persistence and transport of the contaminant(s) under review, how well the source is protected by geology and well design, Wellhead Protection Assessments, and proximity of potential contamination sites and activities.

(2) **Waiver for Inorganics:** The state may grant a waiver if previous analytical results indicate contamination would not occur, provided these data were collected after January 1, 1990.

ANALYTICAL METHODS & LABORATORY CERTIFICATION

ANALYTICAL METHODS

This section summarizes the analytical requirements for IOCs, VOCs and SOCs. The analytical requirements are listed in §§ 141.23 and 141.24. Matrices of the approved analytical methods for IOCs, SOCs and VOCs appear on the following three pages.

IOCs

Analyses of monitoring samples for compliance purposes may only be conducted by laboratories which have been certified by the state or EPA. To receive approval for IOC analyses, a lab must:

(1) Analyze a set of performance evaluation (PE) samples supplied by EPA or the State using the methods listed in Table IX;
(2) Achieve acceptance limits (ALs) established for each IOC as listed in Table IX; and
(3) Pass an on-site inspection, as described in the certification manual.

SOCs

To receive certification for SOC analyses, a laboratory must:

(1) Analyze SOC performance samples supplied by EPA or the State using the methods listed in Table X;
(2) Achieve ALs as listed in Table X for each substance;
(3) Achieve MDLs for each substance as listed in Table X; and
(4) Pass an on-site inspection.

VOCs

To receive certification for VOC analyses, a laboratory must:

(1) Analyze a set of PE samples supplied by EPA or the State using the methods listed in Table XI;
(2) Achieve a ±20 percent AL on 80 percent of all VOCs[19], except vinyl chloride, when the ***actual amount*** is ≥0.010 mg/L;
(3) Achieve a ±40 percent AL on 80 percent of all VOCs, except vinyl chloride, when the ***actual amount*** is <0.010 mg/L;
(4) Achieve a ±40 percent AL on ***vinyl chloride***;
(5) Achieve a method detection limit (MDL) of 0.0005 mg/L; and
(6) Pass an on-site inspection, as described in the certification manual.

STATE LABORATORY CERTIFICATION REQUIREMENTS

As part of their primary enforcement responsibilities, states must assure the availability of sufficient qualified lab facilities to meet the state's analytical needs, establish and maintain a certification program for laboratories, except where all analyses are conducted by state laboratories, and designate official(s) to be responsible for this program.

COST-EFFECTIVE ANALYTICAL STRATEGIES

To minimize analytical costs, labs may select an approved analytical method which measures the greatest number of contaminants for which a system is vulnerable. For example, EPA Method 505 can be used to measure endrin, hexachlorobenzene, hexachlorocyclopentadiene, and simazine.[20]

SAMPLE PRESERVATION

Preservation procedures for inorganic and organic samples are summarized in Tables XII and XIII, respectively. For the exact preservation procedure, consult the methods given in Tables IX, X, and XI.

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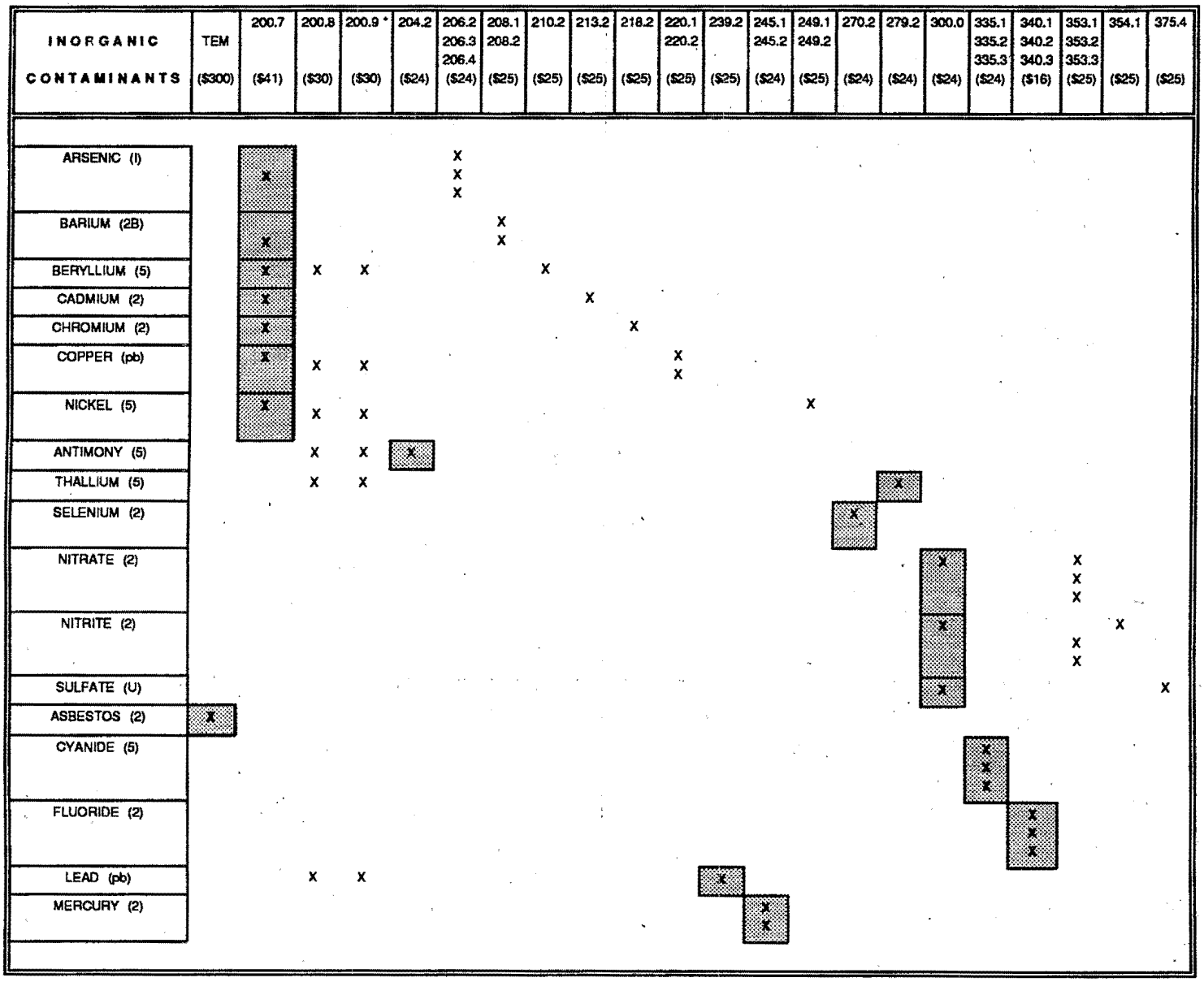
(19) All VOCs for which monitoring is required under Phases I, II, IIB and V. These include the 'unregulated' VOCs listed under §141.40(e).

(20) (Note: Additional information on VOC analysis is available in *How to Convert From THM to VOC Purge and Trap Gas Chromatographic Analysis*. EPA 570/9-88-011. Available from the Safe Drinking Water Hotline, 1-800-426-4791.)

TABLE IX

INORGANIC CHEMICALS

ANALYTICAL METHODS MATRIX



Method #200.9 is not a multi-analyte method, and must be separately for each contaminant.

References for methods:

Phase I	CFR 141.24 (g)(10)
Phase II	CFR 141.23 (k)(1) [56 FR 3569,3581-3582]
Phase II-B	CFR 141.23 (a)(4)(i) [50 FR 30275]
Phase V	CFR 141.23 (k)(1)
Lead/Copper	CFR 141.89 (a) [56 FR 26560]

TABLE X

SYNTHETIC ORGANIC COMPOUNDS

SYNTHETIC ORGANIC COMPOUNDS	504 ($150)	505 ($125)	506 ($125)	507 ($150)	508 ($130)	508A ($225)	1613 ($1500)	515.1 ($250)	525.1 ($400)	531.1 ($190)	547 ($250)	548 ($250)	549 ($125)	550.0 550.1 ($200)
ALACHLOR (2)		X		X					X					
ALDRIN (U)		X			X				X					
ATRAZINE (2)		X		X					X					
BENZO(A)PYRENE (5)									X					X X
BUTACHLOR (U)				X										
CHLORDANE (2)		X			X				X					
DIELDRIN (U)		X			X									
DI(ETHYLHEXYL)-ADIPATE (5)			X						X					
DI(ETHYLHEXYL)-PHTHALATE (5)			X						X					
ENDRIN (5)		X			X				X					
HEPTACHLOR (2)		X			X				X					
HEPTACHLOR EPOXIDE (2)		X			X				X					
HEXACHLOROBENZENE (5)		X			X				X					
HEXACHLOROCYCLO-PENTADIENE (5)		X							X					
LINDANE (2)		X			X				X					
METHOXYCHLOR (2)		X			X				X					
METOLACHLOR (U)				X										
METRIBUZIN (U)				X										
PROPACHLOR (U)					X									
SIMAZINE (5)		X		X					X					
TOXAPHENE (2)		X			X				X					
PENTACHLOROPHENOL (2B)								X	X					
2,4-D (2)								X						
2,4-DB (U)								X						
2,4,5-T (U)								X						
2,4,5-TP (2)								X						
DALAPON (5)								X						
DICAMBA (U)								X						
DINOSEB (5)								X						
PICLORAM (5)								X						
3-HYDROXYCAR-BOFURAN (U)										X				
ALDICARB (AS)										X				
ALDICARB SULFONE (AS)										X				
ALDICARB SULFOXIDE (AS)										X				
CARBARYL (U)										X				
CARBOFURAN (2)										X				
METHOMYL (U)										X				
OXAMYL (5)										X				
DBCP (2)	X													
EDB (2)	X													
2,3,7,8-TCDD (DIOXIN) (5)							X							
DIQUAT (5)													X	
ENDOTHALL (5)												X		
GLYPHOSATE (5)											X			
PCBs (2)		X[21]				X								

(21) Screen for PCBs, but quantitation is by Method # 508A.

TABLE XI

VOLATILE ORGANIC COMPOUNDS

ANALYTICAL METHODS MATRIX

VOLATILE ORGANIC COMPOUNDS	502.1 ($200)	502.2 ($200)	503.1 ($100)	524.1 ($275)	524.2 ($275)
1,1-DICHLOROETHANE (U)	X	X		X	X
1,1-DICHLOROPROPENE (U)	X	X		X	X
1,1,1-TRICHLOROETHANE (1)	X	X		X	X
1,1,1,2-TETRACHLOROTHANE (U)	X	X		X	X
1,1,2-TRICHLOROETHANE (5)	X	X		X	X
1,1,2,2-TETRACHLOROTHANE (U)	X	X		X	X
1,2,3-TRICHLOROPROPANE (U)	X	X		X	X
1,2,4-TRICHLOROBENZENE (5)		X	X		X
1,1-DICHLOROETHYLENE (1)	X	X		X	X
1,2-DICHLOROETHANE (1)	X	X		X	X
1,3-DICHLOROPROPANE (U)	X	X		X	X
1,3-DICHLOROPROPENE (U) [22]	X	X		X	X
2,2-DICHLOROPROPANE (U)	X	X		X	X
BENZENE (1)		X	X	X	X
BROMOBENZENE (U)	X	X	X	X	X
BROMODICHLOROMETHANE (U)	X	X		X	X
BROMOFORM (U)	X	X		X	X
BROMOMETHANE (U)	X	X		X	X
CARBON TETRACHLORIDE (1)	X	X		X	X
CHLORODIBROMOMETHANE (U)	X	X		X	X
CHLOROFORM (U)	X	X		X	X
CHLOROETHANE (U)	X	X		X	X
CHLOROMETHANE (U)	X	X		X	X
o-CHLOROTOLUENE (U)	X	X	X	X	X
p-CHLOROTOLUENE (U)	X	X	X	X	X
o-DICHLOROBENZENE (U)	X	X	X	X	X
m-DICHLOROBENZENE (U)	X	X	X	X	X
p-DICHLOROBENZENE (1)	X	X	X	X	X
ETHYLBENZENE (2)		X	X	X	X
MONOCHLOROBENZENE (2)	X	X	X	X	X
STYRENE (2)		X	X	X	X
TETRACHLOROETHYLENE (2)	X	X	X	X	X
TOULENE (2)		X	X	X	X
TRICHLOROETHYLENE (1)	X	X	X	X	X
VINYL CHLORIDE (1)	X	X		X	X
XYLENES (2)		X	X	X	X
CIS-1,2-DICHLOROETHYLENE (2)	X	X		X	X
DICHLOROMETHANE (5)	X	X		X	X
O-DICHLOROBENZENE (2)	X	X	X	X	X
1,2-DICHLOROPROPANE (2)	X	X		X	X
TRANS-1,2-DICHLOROETHYLENE (2)	X	X		X	X

(22) *i.e.*, cis & trans 1,3 Dichloropropene.

STATE PRIMACY REQUIREMENTS
[40 CFR 142]

IMPLEMENTATION SCHEDULE [see § 142.12(b)]

States are required to submit complete and final primacy revision applications for each rule no later than the date it becomes effective, "unless the State requests an extension and the Administrator has approved the request". In this case, States must submit complete and final applications by the end of the extension period. EPA Regional Administrators may grant primacy extensions for no more than two years beyond the effective date of the regulation.

REGULATION	PUBLICATION DATE	EFFECTIVE DATE	END OF EXTENSIONS
PHASE I :	July 8, 1987	January 8, 1989	Not Applicable
PHASE II :	January 31, 1991	July 30, 1992	July 30, 1994
PHASE IIB :	July 1, 1991	January 1, 1993	January 1, 1994
PHASE V :	July 17, 1992	January 17, 1993	December 17, 1995

BASIC REGULATORY REQUIREMENTS

States must adopt and have authority to enforce provisions at least as stringent as those described in the following sections.

141.23—Inorganic Monitoring
141.24—Organic Monitoring
141.32—Public Notification
141.40—Unregulated Monitoring
141.61—Organic Maximum Contaminant Levels
141.62—Inorganic Maximum Contaminant Levels

NEW OR AMENDED RECORDKEEPING REQUIREMENTS [§142.14]

For each public water system, the state must maintain the following records for 12 years.

(1) The analytical results of monitoring for all contaminants regulated under Phases I, II, IIB and V.
(2) The record of decision of the most recent vulnerability determination.
(3) The current monitoring requirements and most recent sampling frequency decision for each contaminant.

NEW OR AMENDED REPORTING REQUIREMENTS [§142.15]

For each public water system, the state must make quarterly reports of analytical results of monitoring for unregulated contaminants.

NEW SPECIAL PRIMACY REQUIREMENTS [§142.16(e)(2)]

A plan for the initial monitoring period which schedules systems for monitoring according to the availability of certified laboratories in each of the three years. This plan must be enforceable under state law. States may update their monitoring plan submitted under the Phase II Rule or simply note in their application that they will use the same monitoring plan for the Phase V Rule.

STATE WAIVER PROGRAMS [§142.16(e)(1)]

States must receive EPA approval of their monitoring waiver program, before they may use waivers to reduce the Federal sampling requirements for any sampling points under §§ 141.23, 141.24 or 141.40. State program descriptions must include waiver application requirements, the State review process for evaluating sampling point vulnerability and State decision criteria for granting or denying sampling waivers. For additional guidance, see *Guidance to Regions for Review of State Waiver Programs under Phase II & V Primacy Revision Applications*, September 11, 1992, and Region V's *Monitoring Waiver Guidance.*

PUBLIC NOTIFICATION

INTRODUCTION

This section summarizes the public notice requirements for NPDWR violations as described under §141.32.

SYSTEMS AFFECTED

All CWSs, NTNCWSs and TNCWSs are responsible for notifying the public of violations of the NPDWRs. The methods for providing public notice vary depending on the type of system and the type of violation.

VIOLATIONS REQUIRING PUBLIC NOTIFICATION [see §§141.32(a)-(b)]

There are two classes of violations: those which might be characterized as directly affecting public health (Tier 1 Violations) and those involving administrative requirements, such as sampling protocols (Tier 2 Violations).

(1) **Tier 1 Violations** may involve either acute or non-acute health risk. An ***acute violation*** involves an MCL violation by a contaminant listed under § 141.32(a)(ii). These are acute contaminants, meaning that they are capable of causing harmful effects after brief exposure. A ***non-acute violation*** involves contamination that causes harmful effects only after long-term exposure of repeated dosage. Acute and non-acute violations include:
   - ⇒ Failure to comply with an applicable MCL.
   - ⇒ Failure to comply with a prescribed treatment technique.
   - ⇒ Failure to meet any schedule established under a variance or exemption. Typically, this would be a compliance schedule to install treatment or to otherwise comply with the MCL of the contaminant for which the variance or exemption was issued.

(2) **Tier 2 Violations** include:
   - ⇒ Failure to perform water quality monitoring as required by a NPDWR.
   - ⇒ Failure to comply with testing procedures as prescribed by a NPDWR.
   - ⇒ Operating under a variance or an exemption.[23]

CONTENT OF NOTICE [see §§141.32(d)-(e)]

Public notices must include a discussion of the violation, its potential adverse health effects and the population at risk, steps being taken to correct the problem, and recommended precautions.[24] The format, order, and emphasis of notice information varies depending on the circumstances of the violation for which the notice is issued. The circumstances of a violation may vary depending on the *following* factors:

(1) Tier 1 Acute Violation
(2) Tier 1 Non-Acute Violation
(3) Tier 2 Violation
(4) Type of Public Water System: Community, Transient Noncommunity or Nontransient Noncommunity

CONTENT OF NOTIFICATION

Public notices for Tier 1 acute and non-acute violations and Tier 2 notices for variances or exemptions must include health effects language. Mandatory language for contaminants regulated under Phases I, II, IIB and V are described under §141.32(e). However, water systems may include additional information, particularly if the violation has been corrected by the time the notice is issued. Following is an example of mandatory health effects language for beryllium.

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(23) Operating under a variance or an exemption is not a violation in itself. It is referred to as a violation for simplicity, since public notification of failure to comply with an MCL is required.

(24) For a review of the content requirement for public notices, consult EPA's publication, *General Public Notification for Public Water Systems*, (EPA 570/9-89-002, September 1989). This publication is available through EPA's Safe Drinking Water Hotline, 1-800-426-4791.

Mandatory Health Effects Language for Beryllium

The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that beryllium is a health concern at certain levels of exposure. This inorganic metal occurs naturally in soils, ground water and surface waters and is often used in electrical equipment and electrical components. It generally gets into water from runoff from mining operations, discharge from processing plants and improper waste disposal. Beryllium compounds have been associated with damage to the bones and lungs and induction of cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. There is limited evidence to suggest that beryllium may pose a cancer risk via drinking water exposure. Therefore, EPA based the health assessment on noncancer effects with an extra uncertainty factor to account for possible carcinogenicity. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for beryllium at 0.004 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to beryllium.

METHODS OF NOTIFICATION

(1) Local Radio and TV
(2) Local Newspaper
(3) Direct Mail
(4) Water Bills
(5) Hand Delivery
(6) Continuous Posting in Conspicuous Places

TIMING OF NOTIFICATION

The type and nature of the violation determines the time frame under which public notification must occur.

Within 72 hours: **Tier 1 Acute Violations**: All systems must notify the public by radio or television of the presence of a contaminant. TWS and NTWS may instead notify via hand delivery or continuous posting at conspicuous places within the service area.

Within 14 days: **Tier 1 Acute and Non-acute Violations**: All systems must publish initial notification of Tier 1 non-acute violations and follow-up notices of Tier 1 acute violations in local newspapers. TWS and NTWS may instead notify via hand delivery or continuous posting at conspicuous places within the service area.

Within 45 days: **Tier 1 Acute and Non-acute Violations**: CWS must issue follow-up notices via direct mail, in customer water bills, or by hand delivery. TWS and NTWS may make follow-up notice via hand delivery or continuous posting at conspicuous places within the service area. A copy of the most recent public notice must be given to all new billing units or hookups prior to or at the time service begins for existing Tier 1 acute and non-acute violations.

Within 3 months: **Tier 2 Violations**: CWS must issue notices via newspaper. TWS and NTWS may issue notices via hand delivery or by continuous posting at conspicuous places within the service area for the duration of the violation.

Repeated every three months: **All Violations**: All systems must repeat the public notice every three months by direct mail, hand delivery, or continuous posting for as long as the violation, variance or exemption exists. **Note:** For Tier 1 Acute Violations, electronic media and newspaper notices do not need to be repeated and for Tier 1 Non-acute Violations, newspaper notices do not need to be repeated.

TREATMENT OPTIONS

INTRODUCTION

This discussion identifies the Best Available Technology (BAT) and summarizes the conditions for variances and exemptions to be issued. These provisions are listed in §§ 141.61(b) and 142.62. There are three groups of treatment options: (a) permanent treatment options, (b) non-treatment options and (c) short term treatment options.

Table XII

Best Available Technologies and Removal Efficiencies

BAT	% Efficiency
Organics	
Volatile Organics	
Granular Activated Carbon	—
Packed Tower Aeration	—
Oxidation	—
Synthetic Organics	
Granular Activated Carbon	—
Inorganics	
Conventional Technologies	
Coagulation/Filtration	80% - 99%
Lime Softening	45% - 99%
Additional Technologies	
Electrodialysis Reversal	51% - 94%
Ion Exchange	75% - 99%
Reverse Osmosis	67% - 99%

PERMANENT TREATMENT OPTIONS

These are the Best Available Treatment technologies for organic compounds and inorganic chemicals.

(1) Organic Compounds
- (a) Packed Tower Aeration
- (b) Granular Activated Carbon (GAC)
- (c) Oxidation

(2) Inorganic Chemicals
- (a) Coagulation & Filtration
- (b) Lime Softening
- (c) Electrodialysis Reversal
- (d) Ion Exchange
- (e) Reverse Osmosis

(3) **POE Devices** may be permanently installed to meet the NPDWRs, if the requirements for POEs as short term devices are continuously met.

DELAYED TREATMENT OPTIONS

These options involve substituting alternative treatment technologies where the BAT is shown to be infeasible (Variances), or the delay of installing BATs where economics or other factors make more timely installation infeasible.

(1) **Variances**: States may issue variances for any system unable to fully comply with all applicable drinking water regulations *after installation of BAT*. Variances may only be granted if the system cannot meet the requirements by joining another water system or by developing another water source. If a system demonstrates through comprehensive engineering assessments that BAT would achieve only a *de minimis* reduction in contaminant levels, the state may issue a variance without requiring installation. The State must determine that the variance will not pose an unreasonable risk to human health (URTH).

(2) **Exemptions**: States may issue exemptions of up to three years, if the violation does not represent an URTH. States may grant exemptions based economic factors or no reasonable alternative water source is available for those systems brought into operation after the effective date of the NPDWRs.

(a) Exemptions may be extended for two-year periods for systems with less than 500 service connections, if financial assistance is necessary for installation of the treatment.

(b) For systems with more than 500 service connections, exemptions may be extended for a period of not more than the initial three years, if compliance has not been achieved within 12 months after the date of issuance.

SHORT-TERM TREATMENT OPTIONS

States may require systems to provide bottled water, point-of-use devices (POUs) or point-of-entry devices (POEs) as interim control measures to avoid an URTH during a variance or exemption period.

(1) If bottled water is used as a condition for receiving a variance or exemption, the system must put in place a monitoring program that ensures that the bottled water meets all MCLs.

(2) If POU and/or POE devices are used as a condition for obtaining a variance or exemption, the public water system is responsible for:

(a) The operation and maintenance of any device used,

(b) Following a State approved monitoring plan that ensures health protection equivalent to central treatment, and

(c) Following a State approved plan to ensure that the technology in use maintains the microbiological safety of the water at all times.

(3) The State is responsible for:

(a) Requiring performance certification and field testing of each device along with a rigorous engineering design review, if it's not included in the product's certification process;

(b) Reviewing the design and application of each device considering the potential for increasing heterotrophic bacteria concentrations as a result of treatment with activated carbon; and

(c) Ensuring that buildings connected to the system have sufficient POU or POE devices that are properly installed, maintained and monitored for consumer protection.