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EPA

The Phase II Rule

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"Phase II roughly doubled the number of drinking water standards."

The Phase II Rule was published in the *Federal Register* on January 30, 1991 and July 1, 1991. It became effective in 1992 with monitoring requirements beginning on January 1, 1993. This rule set drinking water standards for 38 inorganic and organic chemicals. All community and Non-Transient, Non-Community water systems are required to monitor for and, if necessary, treat their supply for the regulated chemicals. Transient water systems are required to comply with the nitrate and nitrite regulations in Phase II.

Phase II roughly doubled the number of drinking water standards. While many of the Phase II chemicals occur in drinking water due to human activity, others are naturally occurring. Some chemicals are only rarely found in water supplies but are very widely used and were regulated because of the likelihood that they may contaminate supplies in the future.

Drinking Water Standards

Maximum Contaminant Levels (MCLs): Public Water Systems are required to make sure that the water they supply meets the MCL for each Phase II chemical. These are *enforceable* standards. MCLs for Phase II chemicals are listed in Table 1.

Table 1. Phase II MCLs

Contaminant	MCL (mg/L)
Inorganics	
Asbestos	7 MFL*
Barium	2
Cadmium	0.005
Chromium	0.1
Mercury	0.002
Nitrate as N	10
Nitrite as N	1
Total Nitrate/Nitrite	10
Selenium	0.05
Volatile Organics	
o-Dichlorobenzene	0.6
cis-1,2-Dichloroethylene	0.07
trans-1,2-Dichloroethylene	0.1
1,2-Dichloropropane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
Xylenes (total)	10

Contaminant	MCL (mg/L)
Pesticides and PCBs	
Alachlor (Lasso)	0.002
Aldicarb (Temik)**	0.003
Aldicarb sulfoxide**	0.004
Aldicarb sulfone**	0.002
Atrazine (Atranex, Crisazina)	0.003
Carbofuran (Furadan 4F)	0.04
Chlordane	0.002
Dibromochloropropane (DBCP, Nemafume)	0.0002
2,4-D (Formula 40, Weedar 64)	0.07
Ethylene dibromide (EDB, Bromofume)	0.00005
Heptachlor (H-34, Heptox)	0.0004
Heptachlor epoxide	0.0002
Lindane	0.0002
Methoxychlor (DMDT, Marlate)	0.04
Polychlorinated biphenyls (PCBs, Aroclor)	0.0005
Pentachlorophenol	0.001
Toxaphene	0.003
2,4,5-TP (Silvex)	0.05
Treatment Techniques	
Acrylamide	0.05% dosed at 1 mg/L
Epichlorohydrin	0.01% dosed at 20 mg/L

* Million fibers per liter

** Regulation currently not in effect

Treatment Techniques: When EPA determines that it is not economically or technologically feasible to ascertain the level of a contaminant, EPA may set an enforceable Treatment Technique in lieu of an MCL. Two Phase II chemicals are controlled in this way, simply by limiting their use in other treatment processes.

Maximum Contaminant Level Goals (MCLGs): For each chemical, EPA has set a *non-enforceable* health goal which water systems should try to achieve. Water containing a chemical in an amount equal to or below its MCLG is not expected to cause any health problems, even over a lifetime of drinking this water.

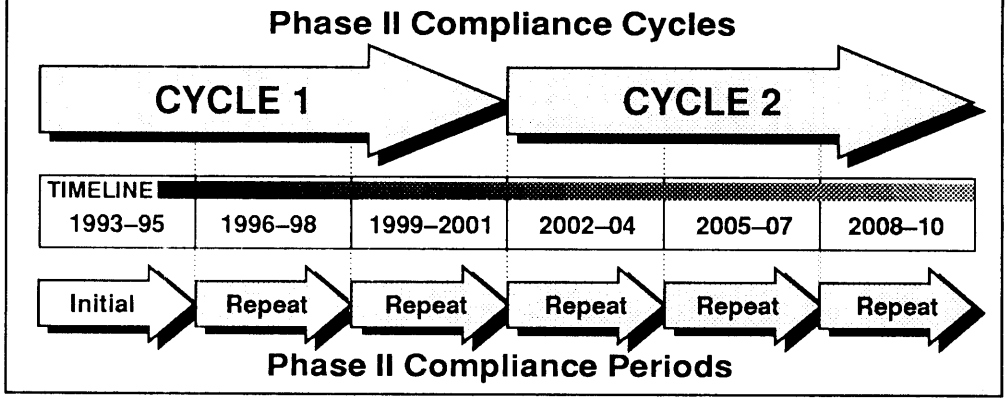
Monitoring Requirements

A major feature introduced in Phase II is its plan for synchronizing compliance monitoring across several existing and upcoming rules. Under this **Standardized Monitoring Framework**, the various monitoring frequencies for most source-related contaminants were coordinated within **compliance periods** of three years each. Some monitoring and related system activities, such as vulnerability assessments, will occur at intervals which may span across up to three of these three-year periods, forming a nine-year **compliance cycle**. The first compliance cycle and the initial compliance period both began on January 1, 1993. Table 2 gives dates for the Framework intervals over the next several decades. Monitoring requirements are given in Table 3.

Other features of Phase II monitoring requirements include the following:

- **Sampling location** - Ground water systems must sample at entry points to the distribution system which are representative of each well after any application of treatment. Surface water systems must sample at points within the distribution system which are representative of each source or at entry points to the distribution system after any application of treatment. Samples must be analyzed by a State-certified lab.
- **Initial sampling frequency** - All systems must sample at a base (or minimum) frequency which is specific for a contaminant or contaminant group. The State may grant monitoring waivers (as discussed below) and may allow a system to substitute suitable previous monitoring data ("grandfathered data") for this initial monitoring. In the initial compliance period, the actual year in which a system samples will be determined by the State.
- **Repeat sampling frequency** - In general, if a system does not detect contaminants in initial samples, then repeat sampling frequencies will be lower than initial frequencies. Repeat monitoring requirements are generally the same for all systems regardless of system size or water source.
- **Trigger to increase monitoring** - If contaminants are detected in any sample, the system must begin quarterly sampling until the State determines that subsequent results are "reliably and consistently" below the MCL. At least two to four consecutive samples must be taken before this determination may be made. Detection is defined separately for

Table 2. Standardized Monitoring Framework



various contaminants or contaminant groups at either the MCL (for IOCs), 50 percent of the MCL (for nitrate/nitrite), at 0.0005 mg/L (for VOCs) or at the analytical method detection limit (for SOCs).

- **Monitoring waivers** - Sampling frequencies may also be reduced or eliminated if the system obtains a waiver based on: 1) previous sampling results and/or 2) an assessment of the system's vulnerability to each specific contaminant. There are two types of waivers based on vulnerability assessments:

  Use waiver: A system may be eligible for a waiver if it can show that a contaminant has not been used, manufactured and/or stored within a certain area around the system's water source. If use cannot be determined, a use waiver cannot be granted.

  Susceptibility waiver: Even if a system is not eligible for a use waiver, it may be eligible for a waiver based on its susceptibility in terms of source protection, wellhead protection program reports, previous sample results, environmental transport and fate of the contaminant, and

Table 3. Compliance Monitoring Requirements

Contaminant	Base Requirement		Trigger that Increases Sampling	Waivers for Base Requirements
	Ground water	Surface water		
Asbestos	1 Sample every 9 years		≥ MCL	YES Based on VA[1]
Nitrate	Annual	Quarterly	≥ 50% MCL	NO
	After 1 year < 50% of MCL, SWS may reduce to an annual sample			
Nitrite	1 Sample: If < 50% of MCL, state discretion		≥ 50% MCL	NO
5 Inorganics	1 Sample every 3 years	Annual sample	≥ MCL	YES Based on analytical results of 3 rounds
18 VOCs	4 Quarterly samples every 3 years Annual after 1 year of no detects		> 0.0005 mg/L	YES Based on VA[1]
17 Pesticides and PCBs	4 Quarterly samples every 3 years After 1 round of no detects: systems >3300 reduce to 2 samples per year every 3 years; systems ≤ 3300 reduce to 1 sample every 3 years		Method Detection Limit (MDL)	YES Based on VA[1]
Unregulated - 1 IOC - 13 SOCs	1 Sample 4 Consecutive quarterly samples		N.A.	YES Based on VA[1]

[1] VA = Vulnerability Assessment

elevated nitrate levels. If susceptibility cannot be determined, this type of waiver cannot be granted.

- **Unregulated contaminant monitoring** - Phase II also contained one-time monitoring requirements for 30 other contaminants during the initial period which began on January 1, 1993. Systems must take one year of quarterly samples for organic contaminants, and one sample for inorganic contaminants. No MCLs have been set for these contaminants, and quarterly monitoring is not required if these chemicals are detected. However, systems do have to conduct repeat sampling for unregulated contaminants every 5 years, regardless of whether they detected these contaminants or not. Systems only need to report the results of this monitoring to the State. Systems with less than 150 service connections may request a waiver from the State. Several of these unregulated contaminants were regulated by the Phase V Rule. For a current list of unregulated contaminants, refer to 40 CFR 141.40.

Treatment Options

- **Permanent treatment options** - For each regulated contaminant, EPA has identified a treatment technology which is considered the best available for achieving the MCL called the **Best Available Technology or BAT**. Systems are not required to install BATs unless they are attempting to get a variance. BATs for Phase II chemicals are listed in Table 4.
- **Deferred treatment options** - Systems which cannot comply with an MCL have two options for deferring installation of treatment:
  - **Variances** allow systems to continue operating but only under and according to a compliance schedule which sets a timeframe for installing treatment to bring the supply into compliance. A system is eligible for a variance only if it is already using BAT. Other factors, including health concerns and the reasonable availability of other sources of water, must also be considered before the State may grant a variance.
  - **Exemptions** from MCLs are available under some conditions including economic difficulties, regardless of whether or not BAT is being used. As with variances though, a compliance schedule must be met, and other factors, including health concerns and the reasonable availability of other sources of water, must also be considered. For systems having no more than 500 service connections, exemptions may be extended for two-year periods if the system demonstrates an effort to take steps necessary for achieving compliance.
- **Short-Term Treatment Options** - As a condition of granting a variance or exemption, States may require a system to provide its consumers with either bottled water, point-of-use (POU) devices or point-of-entry (POE) devices as temporary means to avoid health problems related to exceedance of an MCL.
- **Non-treatment options** - include regionalization, or joining with another nearby system, development of a new source, or blending present supplies with water from other supplies.

Table 4. Phase II BATS

Organics

Volatile Organics; EDB; DBCP
Granular Activated Carbon
Packed Tower Aeration

Pesticides and PCBs
Granular Activated Carbon

Inorganics

Conventional Technologies
Coagulation/ Filtration[1]
Lime Softening[1]

Additional Technologies
Electrodialysis Reversal
Ion Exchange
Reverse Osmosis

Asbestos
Corrosion Control
Diatomite Filtration
Direct Filtration

Optional for Mercury
Granular Activated Carbon

Optional for Selenium
Activated Alumina

[1] Not BAT for variance purposes for systems with <500 service connections.

For More Information

Call the Safe Drinking Water Hotline at 1-800-426-4791