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FACT SHEET

Safe Drinking Water Program Update

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The 1986 Amendments to the Safe Drinking Water Act directed EPA to increase the pace of regulating drinking water contaminants. This Fact Sheet provides an abbreviated status of the regulations that have recently been promulgated.

PUBLIC WATER SYSTEMS

Systems are now divided into three classifications according to the type of population served:

Community Water Systems serve a residential population, such as municipal water utilities, mobile home parks, and apartment buildings having their own water supply system.

Noncommunity water systems generally serve a transient population. Examples are restaurants, motels, parks and churches having their own individual water supply system.

Nontransient-noncommunity systems are a special type of noncommunity system in that they generally serve the same persons over an extended period of time. The principal types are schools, factories, and office buildings

PRIMARY STANDARDS

The Primary Standards set limits on contaminants that might be harmful to human health at levels that are considered achievable by water systems. They also specify the frequency at which systems of various types and sizes must test their water to ensure that it conforms with the standards.

The Primary Standards apply to all community public water systems. Eventually, within the next few years, they will all also apply to nontransient-noncommunity systems. Only the microbiological and nitrate standards apply to noncommunity systems at this time.

Within the next few years, there will be at least 83 Primary Standards.

SECONDARY STANDARDS

The Secondary Standards represent reasonable goals for drinking water aesthetic quality, but are not Federally enforceable. The only recent change is the establishment of a Fluoride secondary standard.

MCLGs AND MCLs

Maximum Contaminant Level Goals (MCLGs) are non-enforceable health goals. They are the numerical limits set for each contaminant at the level at which no adverse health effects on humans can be expected, with an adequate margin of safety.

Maximum Contaminant Levels (MCLs) are the enforceable standards for each contaminant, which is set as close to the MCLGs as economically and technically feasible.

SAFE DRINKING WATER ACT AMENDMENTS OF 1986

On June 19, 1986, the President signed the 1986 Amendments, which greatly increased EPA's responsibility for protecting the nation's drinking water. Some of the major new requirements are:

- EPA must regulate 9 contaminants within one year of enactment, another 40 within 2 years, and a total of 83 within 3 years,
- In addition to the above, at least 25 more regulated contaminants are required by 1991, and 25 more every 3 years thereafter,
- EPA must establish new regulations for surface water systems requiring them to provide filtration, or meet specific criteria to avoid filtration,

- EPA must require public water systems to provide disinfection, and provide criteria for systems to obtain a variance from the requirement,
- EPA is required to issue regulations requiring public water systems to test for unregulated drinking water contaminants, with the list to be re-issued at least every 5 years,
- EPA is provided with new enforcement authority, and directed to issue administrative orders or begin court action against public water systems in violation when States do not take appropriate action. Maximum civil penalty limits are increased to $25,000 per day,
- The "lead ban" requirements of the Amendments ban further use of lead in the installation and repair of potable water systems,
- The Amendments also provided for penalties of up to 5 years and $50,000 fine for tampering with a public water system, and 3 years and $20,000 for threatening to tamper,
- The "Wellhead Protection Program" included in the Act, requires States to develop programs for protecting areas around public water supply wells to prevent future contamination from land uses practices in the vicinity.

RECENT SIGNIFICANT DRINKING WATER REGULATION CHANGES

April 2, 1986 - Fluoride MCL Changes

- The primary MCL for fluoride is changed to 4.0 mg/l for all water systems.
- The secondary MCL for fluoride is set at 2.0 mg/l, with a requirement for systems over that level to provide annual notice to their

July 8, 1987 - New MCLs for 8 VOCs

- MCLs, MCLGs and monitoring requirements are established for 8 volatile organic chemicals (VOCs),
- The regulation establishes the first requirements applicable to the newly-created class of "nontransient-noncommunity" water systems,
- All community and nontransient systems are also required to analyze on a one-time basis, for 34 to 51 unregulated organic chemicals,
- The sampling point for VOCs and unregulated organic chemicals is to be the entry point to the system of each water source, or blended water sources,
- The basic sampling frequency for the VOCs is quarterly, but it can be extended to as long as every 5 years, depending on system size, water source, and determination by the State of the "vulnerability of" the water source.
- Phase-in of the required monitoring is:
  - Over 10,000 population systems - begin by January, 1988
  - 3,300 to 10,000 population - begin by January, 1989
  - Under 3,300 population systems - begin by January, 1991

October 28, 1987 - Revised Public Notification (PN) Requirements

The revised regulations divide violations into two classes:

- Tier 1 violations are for failure to comply with an MCL or treatment technique, or to comply with a variance or exemption schedule. The system owner/operator must:
  - Provide one-time PN in a daily or weekly newspaper within 14 days of the violation, AND,

- Provide direct mail PN with a water bill or by hand delivery, to all customers within 45 days of the violation, to be repeated quarterly as long as the violation exists, AND,
- If the violation is for the nitrate MCL, or the State determines an acute health risk may result, notice must be furnished within 72 hours to local radio and TV stations.

- Tier 2 violations are for failure to perform required monitoring, failure to comply with testing procedures, or if the system becomes subject to a variance or exemption. The system owner/ operator must:
  - Provide PN in a newspaper serving the area within 3 months of the violation or of being granted a variance or exemption, AND,
  - Provide direct mail PN, with a water bill or hand delivery, to all customers quarterly, as long as the violation exists,
  - The State may allow less frequent notice for small systems or for minor monitoring violations.
  - Each PN must contain specific information on the violation, mandatory health effects information and suggested consumer action.
  - The most recent copy of any outstanding PN must be furnished to all new customers.

June 29, 1989 - Surface Water Treatment Requirements

The new requirements apply only to public water systems using surface water as a source. The regulation changes are in response to the 1986 SDWA Amendment requirement that EPA require all surface water systems to provide filtration, except under very special conditions. Major new requirements are:

- All wells that are determined by the State to be "under the direct influence of surface water" must meet treatment requirements the same as surface water systems,
- All surface water systems must provide disinfection, and must maintain a residual concentration of at least 0.2 mg/l in the water entering the distribution system,
- Disinfectant residuals must be measured in the distribution system, at the same points and same time as coliforms are sampled. Residuals cannot be undetectable in more than 5% of the samples each month, for any two consecutive months that the system serves water to the public.
- All surface water treatment plants must be designed to achieve:
  - At least 99.9% (3-log) removal and /or inactivation of Giardia lamblia cysts, and
  - At least 99.99% (4-log) removal and/or inactivation of viruses.
- The major requirements for a surface water system to avoid filtration are:
  - Disinfection must at all times meet specified "CT" values (the disinfectant concentration, multiplied by the time of disinfectant contact), so as to ensure adequate inactivation of Giardia cysts and viruses,
  - Systems must maintain a watershed control program, and
  - The system must not have had any waterborne disease outbreaks, and must not exceed the monthly MCL for total coliforms for any two months in any consecutive 12 month period.

- New requirements for systems using filtration include:
  - States will be required to make a determination for all filtering systems as to whether the total treatment (filtration plus disinfection) acheives the required removal and/or inactivation of Giardia and viruses.
  - Effluent turbidity must be measured by continuous monitoring, or by grab samples every four hours,
  - Conventional or direct filtration systems must achieve a filtered water turbidity of not more than 0.5 NTU in more than 5% of the measurements taken each month, and at all times less than 5 NTU, (the State may increase the limit up to less than 1 NTU upon special determination),
- The new requirements are effective 18 months after promulgation, except that some additional time may be allowed to systems that must install filtration.

June 29, 1989 - Coliform Regulation Changes

All public water systems must meet the revised final coliform MCL and monitoring requirements 18 months after promulgation (December 29, 1990). The current rule remains in force until that date. Principal changes in the rule are:

- Compliance will be based on presence/absence of total coliforms in the sample, rather than the current estimate of coliform density,
- New MCL for systems analyzing at least 40 samples/month: no more than 5% of the monthly samples may be total coliform-positive.
- New MCL for systems analyzing less than 40 samples/month: no more than 1 sample/month may be total coliform-positive.
- Systems must sample according to a written sample siting plan that has been approved by the State,
- Monthly monitoring requirements are slightly changed (see new table in the regulations),
- A set of repeat samples must be collected for each total coliform-positive routine sample. And, in addition, smaller systems will have to collect additional routine samples during the next month, according to the following schedule:

Routine Samples per Month	Number of Routine Repeat Samples	Samples Next Month
1/mo. or fewer	4	5/mo.
2 to 4/mo.	3	5/mo.
5/mo. or greater	3	Standard Sched.

- At least one repeat sample must be from the same tap as the original sample. Other samples must be from within 5 service connections upstream or downstream of the original sample. All repeat samples must be collected within 24 hours of notice, unless the State waives this requirement on an individual case basis.
- If coliforms are detected in any repeat sample, another set of repeat samples must be collected, unless the MCL has been violated, and the system has notified the State.
- The requirement for small systems to collect additional samples the next month may be waived by the State under special protocol.

Primary Drinking Water Standards

CONTAMINANTS	HEALTH EFFECTS	MCL *	SOURCES
MICROBIOLOGICAL			
Total Coliforms (Coliform bacteria, fecal coliforms, streptococcal and other bacteria)	Not necessarily disease producing themselves, but indicators of organisms that cause assorted gastro-enteric infections, dysentery, hepatitis, typhoid fever, cholera, and others; interferes with disinfection	1 per 100 ml	human & animal fecal matter; some free living in nature
Turbidity	Interferes with disinfection	1-5 tu	erosion; runoff and discharges
INORGANIC CHEMICALS			
Arsenic	Dermal and nervous system toxicity effects	.05	geological; pesticide residues; industrial and smelter operations
Barium	Circulatory system effects	1	geological; industrial processes; mining & mfgr. of barium chemicals
Cadmium	Kidney effects	.01	geological; mining and smelting
Chromium	Liver/kidney effects	.05	geological, indust.wastes from metal products & finishing industries; corrosion control
Lead	Central & peripheral nervous system damage; kidney effects; highly toxic to infants and pregnant women	.05 **	dissolves from pipes and lead based solder pipe joints
Mercury	Central nervous system disorders; kidney effects	.002	used in manufacture of paint, paper, vinyl chloride; used in fungicides; geological
Nitrate	Methemoglobinemia (Blue baby syndrome)	10	fertilizer; sewage; feed lots; geological
Selenium	Gastrointestinal effects	.01	geological; mining
Silver	Skin discoloration (Argyria)	.05	geological; mining
Fluoride	Skeletal damage	4	geological; additive to drinking water;
ORGANIC CHEMICALS			
Endrin	Nervous system/ kidney effects	.0002	insecticide used on cotton, small grains, orchards (cancelled)
Lindane	Nervous system/ kidney effects	.004	insecticide used on seed and soil treatments; foliage application; wood protection
Methoxychlor	Nervous system/ kidney effects	.1	insecticide used on fruit trees and vegetables
2,4-D	Liver/kidney effects	.1	herbicide used to control broad-leaf weeds in agriculture; used on forests, range pastures and for aquatic
2,4,5-TP Silvex	Liver/kidney effects	.01	herbicide (cancelled in 1984)
Toxaphene	Cancer risk	.005	insecticide used on cotton, corn, grain
Benzene	Cancer risk	.005	fuel (leaking tanks); solvent commonly used in manufacture of industrial chemicals, pharmaceuticals, paints, pesticides, & plastics
Carbon tetrachloride	Possible cancer	.005	cleaning agent; industrial wastes
p-Dichlorobenzene	Possible cancer	.075	used in insecticides, moth balls, & air deodorizers
1,2-Dichloroethane	Possible cancer	.005	used in manufacture of insecticides; in gasoline
1,1-Dichloroethylene	Liver/kidney effects	.007	used in manufacture of plastics, dyes, perfumes, paints & SOCs
1,1,1-Trichloroethane	Nervous system problems	.2	used in manufacture of food wrappings, synthetic fibers; solvent -degreaser
Trichloroethylene (TCE)	Possible cancer	.005	Metal degreaser waste dry cleaning materials; manufacture of pesticides, waxes, paints, & varnishes; paint stripper
Vinyl chloride	Cancer risk	.002	Breakdown of other VOCs; PVC pipe solvents; plastic & synth. rubber mfgr. wastes
Total trihalomethanes	Cancer risk	.1	Primarily formed when water containing organic matter is treated with chlorine
RADIONUCLIDES			
Gross alpha particle activity	Cancer	15 pC/l	Radium 226; radioactive waste; uranium deposits
Gross beta particle activity	Cancer	4 mrem/ year	Radium 228; radioactive waste; uranium deposits
Radium 226 and 228 (total).	Bone cancer	5 pC/l	Usually geological

* In milligrams per liter, unless otherwise noted.

** Substantial lowering of the number under consideration.

Secondary Drinking Water Standards

CONTAMINANTS	SUGGESTED LEVELS	CONTAMINANT EFFECTS
pH	6.5 to 8.5	Water is too corrosive
Chloride	250 mg/l	Taste & corrosion of pipes
Copper	1 mg/l	Taste and staining of porcelain
Foaming agents	0.5 mg/l	Aesthetic
Sulfate	250 mg/l	Taste and laxative effects
Total dissolved solids (hardness)	500 mg/l	Taste; possible relation between hardness and cardiovascular disease; indicator of corrosivity; damage to plumbing; limit effectiveness of detergents
Zinc	5 mg/l	Taste
Fluoride	2.0 mg/l	Dental fluorosis (brown discoloration of teeth)
Color	15 color units	Aesthetic
Corrosivity	non-corrosive	Aesthetic; health (corrosive water can dissolve pipe materials such as lead)
Iron	0.3 mg/l	Taste; staining of fixtures and laundry
Manganese	0.05 mg/l	Taste; staining of fixtures and laundry
Odor	3 threshold odor number	Aesthetic

Monitoring Required for Unregulated Synthetic Organic Chemicals

LIST 1 - Monitoring Required for all Systems

Bromobenzene	1,1 Dichloroethane
Bromodichloromethane	1,1 Dichloropropene
Bromoform	1,3 Dichloropropene
Bromomethane	1,2 Dichloropropane
Chlorobenzene	1,3 Dichloropropane
Chlorodibromomethane	2,2 Dichloropropane
Chloroethane	Ethylbenzene
Chloroform	Styrene
Chloromethane	1,1,2 Trichloroethane
o-Chlorotoluene	1,1,1,2 Tetrachloroethane
p-Chlorotoluene	1,1,2,2 Tetrachloroethane
Dibromomethane	Tetrachloroethylene
m-Dichlorobenzene	1,2,3 Trichloropropane
o-Dichlorobenzene	Toluene
trans-1,2 Dichloroethylene	p-Xylene
cis-1,2 Dichloroethylene	o-Xylene
Dichloromethane	m-Xylene

List 2 - Required for "vulnerable" Systems

Ethylene Dibromide (EDB)
1,2 Dibromo-3-chloropropane (DBCP)

List 3 - Monitoring Required at State Discretion

Bromochloromethane	n-Propylbenzene
n-Butylbenzene	sec-Butylbenzene
Dichlorodifluoromethane	tert-Butylbenzene
Fluorotrichloromethane	1,2,3 Trichlorobenzene
Hexachlorobutadiene	1,2,4 Trichlorobenzene
Isopropylbenzene	1,2,4 Trimethylbenzene
p-Isopropyltoluene	1,3,5 Trimethylbenzene
Napthalene	

Monitoring Requirements for Noncommunity Supplies

CONTAMINANT	SYSTEM TYPE	TEST INTERVALS
Coliform bacteria	Ground & surface	quarterly *
Nitrate level	Ground & surface	State option
Turbidity	Suface	daily **
Eight VOCs	Nontransient-noncommunity	quarterly ***
Unregulated organics	Nontransient-noncommunity	one-time

* The State may modify the frequency based on a sanitary survey of the system, and history of lab. analyses.

** The State may modify the frequency if an active disinfectant residual is maintained in the system.

*** Repeat sampling may be extended to up to 5 years, depending on system size, detection of VOCs, and determination by the State of "vulnerability".

Monitoring Requirements for Community Supplies

CONTAMINANT	SYSTEM TYPE	INITIAL SAMPLING TO BE COMPLETED	SUBSEQUENT TEST INTERVAL
Coliform bacteria	surface & ground	July, 1977	monthly *
(Revised coliform requirements)	all	EFFECTIVE Dec. 1990	--
Inorganic chemicals	surface	June, 1978	yearly
" "	ground	June, 1978	every 3 yrs.
Organics-pesticides	surface	June, 1978	every 3 yrs.
" "	ground	State option	State option
Eight new VOCs	surface & ground		
	over 10,000 pop.	Dec., 1988	continued
	3,300-10,000 pop.	Dec., 1989	quarterly/up
	under 3,300 pop.	Dec., 1991	to 5 years *
51 unregulated	surface & ground	same as VOCs	one-time
Alpha radiation	surface & ground	June, 1980	every 4 yrs.
Beta radiation	surface <10,000	June, 1979	every 4 yrs.
Trihalomethanes	over 75,000 pop.	Jan., 1981	quarterly *
"	10,000-75,000 pop.	Jan., 1983	quarterly *
Turbidity	surface	June, 1977	daily
(Revised turbidity requirements)	surface	EFFECTIVE Dec. 1990	Continuous or every 4 hour
Sodium	surface	Feb. 1983	yearly
"	ground	Feb. 1983	every 3 yrs.
Corrosivity	surface & ground	Feb., 1983	one-time
Disinfectant residual	surface	EFFECTIVE Dec. 1990	
- Entering dist. syst.			continuous
- In distribution syst.			Same as colif.

* See regulations for exceptions and details.