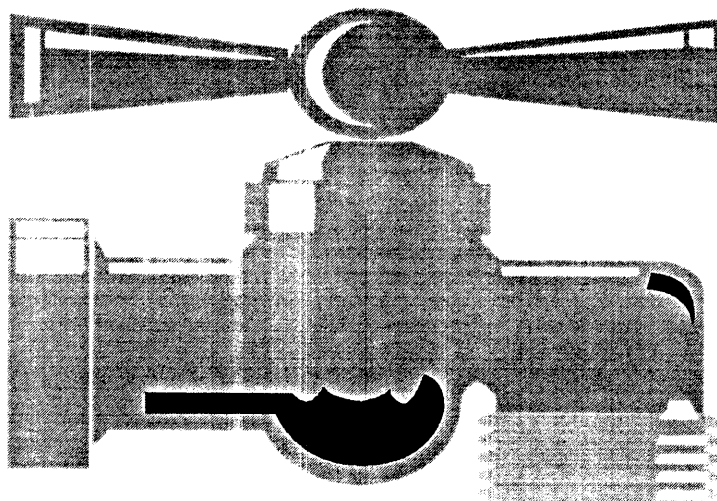


United States
Environmental Protection
Agency

Office of Water
4601

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EPA **IS YOUR DRINKING
WATER SAFE?**



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Is Your Drinking Water Safe?

Introduction

Most Americans believe their drinking water is the best in the world. Servicemen and their families, vacationers, tourists, and others who travel abroad know the familiar problems of unsafe drinking water. At home we scarcely give it a thought. We believe that the purity of our water can be depended upon. And usually we are right. But there are exceptions.

These cases are serious enough to have moved the Congress of the United States to enact, in 1974, a far-reaching program to ensure that our drinking water is as good as we think it is. In 1986, Congress updated this program to set mandatory guidelines for regulating key contaminants, require the monitoring of unregulated contaminants, establish benchmarks for treatment technologies, bolster enforcement, and promote protection of ground water sources. This comprehensive program—and what it means to your health—is the subject of this pamphlet.

The Problem

If our water is good, why do we need a special program to protect it? The reason is that the situation has been changing dramatically during recent decades. Our sources of water supply, both surface and ground water, are being endangered by new chemicals or microbiological contaminants.

During these same years, our ability to detect contaminants has been improving. Modern science can now identify specific chemicals in terms of one part contaminant in one billion parts of water. In some cases, scientists can measure them in *trillionths*. One part per billion is equivalent to one pound in 500,000 tons or the first 16 inches or so of a trip to the moon. In case you think such small amounts can't be very significant, keep in mind that you can get sick from a single microscopic virus.

With information so detailed, new questions arise. What is the effect of consuming these contaminants in such small amounts over long periods of time? Doctors say that an *acute*, i.e., immediate illness, comes from this or that virus or poison. But *chronic*, i.e. long-term problems that develop over many years, are not so quickly diagnosed. There is genuine concern in the scientific community that prolonged exposure to certain elements, even at levels as low as a few parts per billion or trillion, may be increasing the incidence of cancer and heart disease.

The Centers for Disease Control tell us there were an average of almost 7,400 cases of illness in the United States linked to drinking water each year from 1971 to 1985. Total reported cases in this period ranged from

1983's high of 21,000 to 1985's low of 1,600. These numbers are generally thought to be considerably lower than the actual figures because drinking water contaminants are not always considered suspect.

While we have almost eliminated typhoid and cholera as water problems, we must continue to address the threat of viruses and other disease-causing organisms, as well as chemical contamination.

Although we currently know a great deal about the health impacts of drinking water contamination, many questions remain. Ongoing research will no doubt provide new information which will answer some old questions and generate some new ones. Meanwhile, we can take the following steps to reduce the risks to our health:

- Ensure that our water is treated to remove harmful contaminants,
- Test or monitor the purity of our water regularly to ensure its quality, and
- Develop an informed citizenry.

The National Approach

The Safe Drinking Water Act directs the U.S. Environmental Protection Agency (EPA) to establish minimum national drinking water standards. These standards set limits on the amounts of various substances sometimes found in drinking water.

This means that every public water supply in the country serving at least 15 service connections or 25 or more people must ensure that its water meets these minimum standards. Even non-community supplies, such as campgrounds and roadside motels with their own water supplies, are covered by the regulations.

In 1986, Congress passed a set of amendments that expanded the protection to be provided by the Safe Drinking Water Act of 1974. These amendments accelerated EPA's regulation of contaminants, banned all future use of lead pipe and lead solder in public drinking water systems, mandated greater protection of ground water sources of drinking water, and streamlined enforcement procedures to ensure that suppliers comply with the Act.

The amendments gave EPA three years to set standards for 83 contaminants, including 26 for which the Agency had already set enforceable Maximum Contaminant Levels (MCLs). In addition, EPA must set MCLs for at least 25 more contaminants by 1991 and must regulate an additional 25 every three years thereafter. Enforcement of each new standard will begin 18 months after each new or revised standard is set.

The lead ban prohibits the use of lead solders, flux and pipes in the installation or repair of public water systems and drinking water plumbing connected to these systems. Public water systems must tell their users of the potential sources of lead contamination, its health effects, and the steps they can reasonably take to mitigate lead contamination. States are responsible for enforcing the lead ban, and EPA can withhold up to 5 percent of a State's Public Water System Supervision grant if the Agency determines the State is not enforcing the requirements.

Ground Water has been protected under the 1974 Safe Drinking Water Act and by State programs that pre-date the Federal effort. The 1986 amendments extend that protection by establishing programs to protect critical ground water sources of drinking water, to protect areas around wells that supply public drinking water systems, and by regulating the underground injection of wastes below drinking water sources.

Enforcement is vital to the success of the Safe Drinking Water Act. The amendments to the Act authorize EPA to file civil suits or issue administrative orders against public water systems in violation when States are slow to take appropriate enforcement action, or when the State asks EPA to act. Maximum civil penalties are now \$25,000 per day of violation.

Small water systems face numerous obstacles to meeting these new mandates. Lack of resources and expertise are foremost among their problems. To help small systems comply with the new rules, EPA has taken steps to mobilize all groups interested in drinking water quality to use creative approaches to build local and State capacity through outreach, education, technical assistance and other institutional support.

Large systems, most of which easily complied with the requirements of the 1974 Safe Drinking Water Act, are also challenged by the new requirements. For example, one amendment requires that granular activated carbon (GAC) filtration, an effective but expensive technology, be consid-

ered the “best available technology” for controlling synthetic organic chemicals. That means any other (cheaper) technology that a water system substitutes for GAC must control these contaminants at least as well.

A new rule will require most large and small systems to filter surface water supplies of drinking water that are not adequately protected against contamination. Congress intended this requirement to protect the public against *Giardia lamblia*, a virulent protozoan, and other contaminants. Systems must also disinfect their drinking water supplies, something which all but some of the smallest have been doing all along. The filtration and disinfection requirements mean many drinking water systems must invest in new equipment.

The State Role

In the 1974 Safe Drinking Water Act, Congress said it wanted to ensure safe drinking water for all Americans. Congress preferred that the States take on the responsibility for the new program, which would build on existing State programs. Since 1974, 54 States and territories have been granted primary enforcement authority for the program. EPA was responsible for protecting the quality of water on Indian lands. The 1986 amendments change that. Now, Indian tribes that meet the same criteria as States can assume primary enforcement authority over their drinking water. At publication, no Indian tribe has primacy for the drinking water program.

To be given primary enforcement authority for the program and to maintain it over time, a State or Indian tribe must adopt drinking water standards at least as stringent as the national ones. (They may set stricter standards if they wish.) Each State or tribe must also be able to carry out adequate monitoring and enforcement requirements. If a State or tribe cannot or does not do so, EPA will step in and conduct the program.

Public Notification

Since June 24, 1977, Federal law has required your water supplier to periodically sample and test the water supplied to your tap. Most of the larger suppliers were already doing that. If a water supplier has not tested the water or if tests reveal that a national drinking water standard has been violated--that is, if there is too much of any substance for which a national standard has been set--the supplier must move to correct the situation. The supplier must also notify the appropriate State agency of the violation.

And you, the customer, must be notified too. You may sometimes be notified by:

-
- A notice in the newspaper,
 - An announcement on the radio or television, or
 - A letter from the health department or your water system, telling you that a drinking water standards has been violated.

If you hear or read an announcement that a drinking water standard has been violated, don't panic. The announcement will explain the problem and its potential adverse health effects. It will also explain what precautions you should take and what the system is doing to correct the problem. You will also be told whether you should seek alternate supplies of drinking water until the violation is corrected.

Water systems must notify the principal radio and television stations serving their areas within 72 hours of discovering a violation that poses an acute risk to human health. Public notice of acute violations must appear in local newspapers within 14 days of their detection. Systems must report continuous violations every three months. Annual notification is required for less serious violations. This flexibility in public notification provided by the 1986 amendments means EPA and the States can devote more attention to keeping the public informed of truly serious risks.

Certain violations are cause for immediate action by consumers to ensure that public health is not endangered. Other MCL violations will not mean that your health is at risk immediately. The limit on the amount of each substance allowed in drinking water was based on what you can consume for a lifetime without adverse health effects. The limit was based on the consumption of two liters (a little more than two quarts) of water (or water-based fluids such as coffee, tea or soft drinks) every day for a lifetime. A large safety margin was built into most standards so that you will not be harmed even if the water you drink exceeds some of the maximum contaminant levels for short periods of time.

The fact that your State water agency or water supplier announces a violation of a drinking water standard is not by itself cause for alarm. It is a safety precaution required by Congress to call public attention to deficiencies in the drinking water supply. This procedure is intended to keep you informed so that you can make intelligent decisions about the problem.

In essence, Congress said in the Safe Drinking Water Act that you have a right to expect water that meets minimum national standards for protection of public health. You have a right to be told—and your water supplier *must* tell you—if your water does not meet these standards. Your supplier is also obliged to inform you if the water is not being monitored as required. With such information from the supplier or State, you will know what precautions to take. And you will be able to seek the attention of the water supplier through public opinion to do whatever is necessary to bring you safe water.

That might require major or minor improvements in your public water supply system. It might require a new source of water. Most large systems will probably be able to remedy any problems that may be discovered. Some smaller systems may not. In some cases, the best alternative might be to tie into a nearby system.

Whatever the alternative, the public has a right to know about the quality of its drinking water, and the supplier has the clear responsibility to correct violations promptly or provide alternative, safe sources. With that information, the public can then weigh all possible alternatives and help make the decisions needed to ensure safe drinking water.

If adequate steps are not taken to correct violations of safe drinking water standards, you have additional rights.

You—or any individual or organization—have the right to bring suit against anyone you believe is violating the law: the water supply system, the State, or EPA.

The Primary Standards

The drinking water standards established by EPA reflect the best available scientific and technical judgement. They were refined by the suggestions and advice of a 15-member National Drinking Water Advisory Council, made up of representatives of the general public, State and local agencies, and experts in the field of public water supply. Also, EPA's Science Advisory Board, made up of scientists, reviews the regulations to be sure they are based on sound science. In addition, the regulations are reviewed in draft by other Federal agencies, environmental groups, and State and industry associations, and the public.

All EPA regulations are published for review and are subject to public hearings before they go into effect. The National Primary Drinking Water Regulations are no exception. Many witnesses testify at the public hearings and EPA receives thousands of statements after the regulations were proposed. EPA considers these comments when preparing the final version of the regulations.

The regulations set achievable levels of drinking water quality to protect your health. They were originally called "interim" regulations because the 1974 Act stipulated that EPA was to issue MCLs on an interim basis and then to revise them periodically. The final MCL for only one chemical, fluoride, had been issued when Congress dropped "interim" from the regulations' status. When that happened, interim MCLs for 25 contaminants and the final MCL for fluoride became National Primary Drinking Water Regulations.

The 1986 amendments require EPA to issue a Maximum Contaminant Level Goal (MCLG) along with an MCL. (MCLGs were known as Recommended Maximum Contaminant Levels before the amendments.) An MCLG is an unenforceable health goal equal to the maximum level of a contaminant which is not expected to cause any adverse health effects over a lifetime of exposure and includes a margin of safety. EPA must, by law, set MCLs as close to MCLGs as technology and economics allow.

Not every contaminant must have an MCLG and an MCL. EPA can, instead, adopt a National Primary Drinking Water Regulation that requires the use of a specific treatment method be used to control a contaminant. The Agency has this option when it is not technically or economically feasible to determine how much of a contaminant is present in drinking water.

Most substances currently regulated under the Safe Drinking Water Act occur naturally in our environment and in the foods we eat. The national drinking water standards set by EPA reflect the levels we can safely consume in our water, taking into account the amounts we are exposed to from other sources.

Only two substances for which standards have been set pose an immediate threat to health whenever they are exceeded:

Bacteria—Coliform bacteria from human and animal wastes may be found in drinking water if the water is not properly treated. These bacteria may cause disease themselves or indicate that other harmful organisms may be present in the water. Waterborne diseases such as typhoid, cholera, infectious hepatitis and dysentery have been traced to improperly disinfected drinking water. If you should receive notice that the bacteria level in your water exceeds the minimum standard, follow the directions given in the notice.

Nitrate—Nitrate in drinking water above the national standard poses an immediate threat to children six months to one year old. In some infants, excessive levels of nitrate have been known to react with the hemoglobin in the blood to produce an anemic condition commonly known as “blue baby.” If you receive notice that your drinking water contains an excessive amount of nitrate, do not give the water to infants under three months of age and do not use it to prepare a formula. Do not boil the water for extensive periods with the intention of reducing the nitrate, because such boiling will only increase the nitrate concentration. Simply read the notice you receive and follow its instructions carefully.

The table on the following pages presents the National Primary Drinking Water Standards for 30 contaminants. In addition to MCLs, the health effects and sources of each contaminant are listed. Other than for bacteria and nitrate, as discussed above, water that exceeds the MCLs for the elements on the table will pose no immediate threat to public health. However, these substances must be controlled because drinking water that exceeds these standards over long periods of time may prove harmful.

The Secondary Standards

Unlike primary drinking water regulations, secondary drinking water regulations are not designed to protect the public health. Instead, they are intended to protect “public welfare” by providing guidelines regarding the taste, odor, color and other aesthetic aspects of drinking water which do not present a health risk. The effects of 13 contaminants for which EPA has developed Secondary Drinking Water Standards for the States are presented in the table following the National Primary Drinking Water Standards.



National Primary Drinking Water Standards

United States Environmental Protection Agency
Office of Water
4601
Washington DC 20460
EPA 810-F-94-001A
February 1994

Contaminants	MCLG (mg/L)	MCL (mg/L)	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Fluoride	4.0	4.0	Skeletal and dental fluorosis	Natural deposits; fertilizer, aluminum industries; water additive
Volatile Organics				
Benzene	zero	0.005	Cancer	Some foods; gas, drugs, pesticide, paint, plastic industries
Carbon Tetrachloride	zero	0.005	Cancer	Solvents and their degradation products
p-Dichlorobenzene	0.075	0.075	Cancer	Room and water deodorants, and "mothballs"
1,2-Dichloroethane	zero	0.005	Cancer	Leaded gas, fumigants, paints
1,1-Dichloroethylene	0.007	0.007	Cancer, liver and kidney effects	Plastics, dyes, perfumes, paints
Trichloroethylene	zero	0.005	Cancer	Textiles, adhesives and metal degreasers
1,1,1-Trichloroethane	0.2	0.2	Liver, nervous system effects	Adhesives, aerosols, textiles, paints, inks, metal degreasers
Vinyl Chloride	zero	0.002	Cancer	May leach from PVC pipe; formed by solvent breakdown
Coliform and Surface Water Treatment				
<i>Giardia lamblia</i>	zero	TT	Gastroenteric disease	Human and animal fecal waste
<i>Legionella</i>	zero	TT	Legionnaire's disease	Indigenous to natural waters; can grow in water heating systems
Standard Plate Count	N/A	TT	Indicates water quality, effectiveness of treatment	
Total Coliform*	zero	<5%+	Indicates gastroenteric pathogens	Human and animal fecal waste
Turbidity*	N/A	TT	Interferes with disinfection, filtration	Soil runoff
Viruses	zero	TT	Gastroenteric disease	Human and animal fecal waste
Phase II - Inorganics				
Asbestos (>10um)	7MFL	7MFL	Cancer	Natural deposits; asbestos cement in water systems
Barium*	2	2	Circulatory system effects	Natural deposits; pigments, epoxy sealants, spent coal
Cadmium*	0.005	0.005	Kidney effects	Galvanized pipe corrosion; natural deposits; batteries, paints
Chromium* (total)	0.1	0.1	Liver, kidney, circulatory disorders	Natural deposits; mining, electroplating, pigments

NOTES: * Indicates original contaminants with interim standards which have been revised.

TT=Treatment Technique requirement

MFL=Million Fibers per Liter

Contaminants	MCLG (mg/L)	MCL (mg/L)	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Phase II - Organics (continued)				
Lindane	0.0002	0.0002	Liver, kidney, nerve, immune, circulatory	Insecticide on cattle, lumber, gardens; restricted 1983
Methoxychlor	0.04	0.04	Growth, liver, kidney, nerve effects	Insecticide for fruits, vegetables, alfalfa, livestock, pets
Pentachlorophenol	zero	0.001	Cancer; liver and kidney effects	Wood preservatives, herbicide, cooling tower wastes
PCBs	zero	0.0005	Cancer	Coolant oils from electrical transformers; plasticizers
Styrene	0.1	0.1	Liver, nervous system damage	Plastics, rubber, resin, drug industries; leachate from city landfills
Tetrachloroethylene	zero	0.005	Cancer	Improper disposal of dry cleaning and other solvents
Toluene	1	1	Liver, kidney, nervous, circulatory	Gasoline additive; manufacturing and solvent operations
Toxaphene	zero	0.003	Cancer	Insecticide on cattle, cotton, soybeans; cancelled 1982
2,4,5-TP	0.05	0.05	Liver and kidney damage	Herbicide on crops, right-of-way, golf courses; cancelled 1983
Xylenes (total)	10	10	Liver, kidney; nervous system	By-product of gasoline refining; paints, inks, detergents
Lead and Copper				
Lead*	zero	TT†	Kidney, nervous system damage	Natural/industrial deposits; plumbing, solder, brass alloy faucets
Copper	1.3	TT‡	Gastrointestinal irritation	Natural/industrial deposits; wood preservatives, plumbing
Phase V - Inorganics				
Antimony	0.006	0.006	Cancer	Fire retardants, ceramics, electronics, fireworks, solder
Beryllium	0.004	0.004	Bone, lung damage	Electrical, aerospace, defense industries
Cyanide	0.2	0.2	Thyroid, nervous system damage	Electroplating, steel, plastics, mining, fertilizer
Nickel	0.1	0.1	Heart, liver damage	Metal alloys, electroplating, batteries, chemical production
Thallium	0.0005	0.002	Kidney, liver, brain, intestinal	Electronics, drugs, alloys, glass
Organics				
Adipate, (di(2-ethylhexyl))	0.4	0.4	Decreased body weight; liver and testes damage	Synthetic rubber, food packaging, cosmetics
Dalapon	0.2	0.2	Liver, kidney	Herbicide on orchards, beans, coffee, lawns, road/railways
Dichloromethane	zero	0.005	Cancer	Paint stripper, metal degreaser, propellant, extraction
Dinoseb	0.007	0.007	Thyroid, reproductive organ damage	Runoff of herbicide from crop and non-crop applications
Diquat	0.02	0.02	Liver, kidney, eye effects	Runoff of herbicide onland & aquatic weeds

NOTES:

† Action Level = 0.015 mg/L

‡ Action Level = 1.3mg/L

TT = Treatment Technique requirement

* Indicates original contaminants with interim standards which have been revised.

Contaminants	MCLG (mg/L)	MCL (mg/L)	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Phase II - Inorganics (continued)				
Mercury* (inorganic)	0.002	0.002	Kidney, nervous system disorders	Crop runoff; natural deposits; batteries, electrical switches
Nitrate*	10	10	Methemoglobinemia	Animal waste, fertilizer, natural deposits, septic tanks, sewage
Nitrite	1	1	Methemoglobinemia	Same as nitrate; rapidly converted to nitrate
Selenium*	0.05	0.05	Liver damage	Natural deposits; mining, smelting, coal/oil combustion
Phase II - Organics				
Acrylamide	zero	TT	Cancer, nervous system effects	Polymers used in sewage/wastewater treatment
Alachlor	zero	0.002	Cancer	Runoff from herbicide on corn, soybeans, other crops
Aldicarb*	0.001	0.003	Nervous system effects	Insecticide on cotton, potatoes, others; widely restricted
Aldicarb sulfone*	0.001	0.002	Nervous system effects	Biodegradation of aldicarb
Aldicarb sulfoxide*	0.001	0.004	Nervous system effects	Biodegradation of aldicarb
Atrazine	0.003	0.003	Mammary gland tumors	Runoff from use as herbicide on corn and non-cropland
Carbofuran	0.04	0.04	Nervous, reproductive system effects	Soil fumigant on corn and cotton; restricted in some areas
Chlordane*	zero	0.002	Cancer	Leaching from soil treatment for termites
Chlorobenzene	0.1	0.1	Nervous system and liver effects	Waste solvent from metal degreasing processes
2,4-D*	0.07	0.07	Liver and kidney damage	Runoff from herbicide on wheat, corn, rangelands, lawns
o-Dichlorobenzene	0.6	0.6	Liver, kidney, blood cell damage	Paints, engine cleaning compounds, dyes, chemical wastes
cis-1,2-Dichloroethylene	0.07	0.07	Liver, kidney, nervous, circulatory	Waste industrial extraction solvents
trans-1,2-Dichloroethylene	0.1	0.1	Liver, kidney, nervous, circulatory	Waste industrial extraction solvents
Dibromochloropropane	zero	0.0002	Cancer	Soil fumigant on soybeans, cotton, pineapple, orchards
1,2-Dichloropropane	zero	0.005	Liver, kidney effects; cancer	Soil fumigant; waste industrial solvents
Epichlorohydrin	zero	TT	Cancer	Water treatment chemicals; waste epoxy resins, coatings
Ethylbenzene	0.7	0.7	Liver, kidney, nervous system	Gasoline; insecticides; chemical manufacturing wastes
Ethylene dibromide	zero	0.00005	Cancer	Leaded gas additives; leaching of soil fumigant
Heptachlor	zero	0.0004	Cancer	Leaching of insecticide for termites, very few crops
Heptachlor epoxide	zero	0.0002	Cancer	Biodegradation of heptachlor

NOTES: * Indicates original contaminants with interim standards which have been revised.

TT=Treatment Technique requirement MFL=Million Fibers per Liter

Contaminants		MCLG (mg/L)	MCL (mg/L)	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Phase V - Organics (continued)					
Dioxin	zero	0.00000003	Cancer		Chemical production by-product; impurity in herbicides
Endothall	0.1	0.1	Liver, kidney, gastrointestinal		Herbicide on crops, land/aquatic weeds; rapidly degraded
Endrin	0.002	0.002	Liver, kidney, heart damage		Pesticide on insects, rodents, birds; restricted since 1980
Glyphosate	0.7	0.7	Liver, kidney damage		Herbicide on grasses, weeds, brush
Hexachlorobenzene	zero	0.001	Cancer		Pesticide production waste by-product
Hexachlorocyclopentadiene	0.05	0.05	Kidney, stomach damage		Pesticide production intermediate
Oxamyl (Vydate)	0.2	0.2	Kidney damage		Insecticide on apples, potatoes, tomatoes
PAHs (benzo(a)pyrene)	zero	0.0002	Cancer		Coal tar coatings; burning organic matter; volcanoes, fossil fuels
Phthalate, (di(2-ethylhexyl))	zero	0.006	Cancer		PVC and other plastics
Picloram	0.5	0.5	Kidney, liver damage		Herbicide on broadleaf and woody plants
Simazine	0.004	0.004	Cancer		Herbicide on grass sod, some crops, aquatic algae
1,2,4-Trichlorobenzene	0.07	0.07	Liver, kidney damage		Herbicide production; dye carrier
1,1,2-Trichloroethane	0.003	0.005	Kidney, liver, nervous system		Solvent in rubber, other organic products; chemical production wastes
Other Proposed (P) and Interim (I) Standards					
Beta/photon emitters (I) and (P) zero	4 mrem/yr	Cancer			Decay of radionuclides in natural and man-made deposits
Alpha emitters (I) and (P)	15 pCi/L	Cancer			Decay of radionuclides in natural deposits
Combined Radium 226/228 (I) zero	5 pCi/L	Bone cancer			Natural deposits
Radium 226*(P)	zero	20 pCi/L	Bone cancer		Natural deposits
Radium 228*(P)	zero	20 pCi/L	Bone cancer		Natural deposits
Radon (P)	zero	300 pCi/L	Cancer		Decay of radionuclides in natural deposits
Uranium (P)	zero	0.02	Cancer		Natural deposits
Sulfate (P)	400/500	400/500	Diarrhea		Natural deposits
Arsenic*(I)	0.05	0.05	Skin, nervous system toxicity		Natural deposits; smelters, glass, electronics wastes; orchards
Total Trihalomethanes (I)	zero	0.10	Cancer		Drinking water chlorination by-products

NOTES:

* Indicates original contaminants with interim standards which have been revised.

pCi = picocurie - a measure of radioactivity

mrem = millirems - a measure of radiation absorbed by the body

NATIONAL SECONDARY DRINKING WATER STANDARDS*

CONTAMINANTS	SUGGESTED LEVELS	CONTAMINANT EFFECTS
Aluminum	0.05 - 0.2 mg/L	Discoloration of water
Chloride	250 mg/L	Salty taste; corrosion of pipes
Color	15 color units	Visible tint
Copper	1.0 mg/L	Metallic Taste; blue/green staining of porcelain
Corrosivity	non-corrosive	Metallic taste; fixture staining, corroded pipes (Corrosive water can leach pipe materials, such as lead, into drinking water)
Fluoride	2.0 mg/L	Dental Fluorosis (a brownish discoloration of the teeth)
Foaming Agents	0.5 mg/L	Aesthetic - Frothy, cloudy, bitter taste, odor
Iron	0.3 mg/L	Bitter metallic taste; staining of laundry, rusty color, sediment
Manganese	0.05 mg/L	Taste; staining of laundry, black to brown color, black staining
Odor	3 threshold odor	"Rotten egg," musty or chemical smell
pH	6.5 - 8.5	Low pH - Bitter metallic taste, corrosion High pH - Slippery feel, soda taste, deposits
Silver	0.1 mg/L	Argyria (discoloration of skin), greying of eyes
Sulfate	250 mg/L	Salty taste; laxative effects
Total Dissolved Solids (TDS)	500 mg/L	Taste and possible relation between low hardness and cardiovascular disease; also an indicator of corrosivity (related to lead levels in water); can damage plumbing and limit effectiveness of soaps and detergents
Zinc	5 mg/L	Metallic taste

*Secondary Drinking Water Standards are unenforceable federal guidelines regarding the taste, odor, color-and certain other non-aesthetic effects-of drinking water. EPA recommends them to the States as reasonable goals, but federal law does not require water systems to comply with them. States may, however, adopt their own enforceable regulations governing these concerns. To be safe, check your State's drinking water rules.

Summary

The Safe Drinking Water Act gave the country its first comprehensive national program to safeguard public drinking water. It established the national drinking water standards, which protect the health of everyone who receives their drinking water from systems serving at least 25 people or having at least 15 service connections. More than 80 percent of the U.S. population and a quarter million drinking water systems, including non-community water systems, are affected by the Act.

In 1986, Congress amended the Safe Drinking Water Act in response to various concerns raised by the public, EPA, State governments and the water supply industry. The pace of regulating drinking water contaminants was increased. EPA was given a schedule for regulating contaminants that threaten public health and deadlines for specifying criteria for the filtration of surface water supplies and the disinfection of drinking water from surface and ground water sources. The use of lead-containing plumbing materials in public water systems and private drinking water systems that connect to public supplies was outlawed.

The amendments also increased protection of ground water, a crucial source of drinking water. And they gave Indian tribes the same status as States in seeking primary responsibility for drinking water and underground injection control programs.

Many water supply systems will be able to meet the new national requirements with a minimum of effort. However, some water systems, especially the small ones, may have a hard time affording the investment in technology and technical expertise that these new regulations will require. EPA is providing them with technical assistance.

EPA is also aiding States that need help with technical assistance and grants for program administration. EPA is carrying on research to learn more about the health effects of other potential water contaminants, how to detect them in water, and how to get rid of them.

But the major responsibility for bringing you safe drinking water rests with your water supplier, your State, and ultimately with you as a concerned citizen.

This pamphlet has attempted to describe the drinking water program in simple, non-technical language. But the job of implementing the Safe Drinking Water Act and amendments is no simple matter. It is complex. It requires your cooperation and support.

And it requires your understanding that you may have to pay more for safe drinking water--especially if you are served by a small water supply system that has not kept up with modern technology.

It is expected that the cost of safe drinking water for some consumers will increase substantially as systems improve their disinfection or filtration practices. For consumers served by systems that have heavy metal or inorganic contaminant problems, the cost may be even greater.

Whatever the added cost might be, keep the alternatives in mind: water that's safe to drink, or the risk of disease or other harmful effects. It's a small price to pay for assuring yourself, your family, your community, and all Americans that our water is truly safe to drink.

Need More Information?

Additional information about safe drinking water, the 1986 amendments to the Safe Drinking Water Act, and other related issues is available from EPA's Safe Drinking Water Hotline: 1-800-426-4791. The following Regional Offices and State agencies can also provide you with information.

Regional Offices

EPA Region 1
JFK Federal Building
1 Congress Street
Boston, MA 02203

EPA Region 2
26 Federal Plaza
New York, NY 10278

EPA Region 3
841 Chestnut Street
Philadelphia, PA 19107

EPA Region 4
345 Courtland St. NE
Atlanta, GA 30365

EPA Region 5
77 West Jackson Blvd.
Chicago, IL 60604

EPA Region 6
1445 Ross Avenue
12th Floor
Dallas, TX 75202

EPA Region 7
726 Minnesota Avenue
Kansas City, KS 66101

EPA Region 8
999 18th Street
Denver, CO 80202

EPA Region 9
75 Hawthorne Street
San Francisco, CA 94105

EPA Region 10
1200 Sixth Avenue
Seattle, WA 98101

States Covered

Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

New Jersey, New York, Puerto Rico, Virgin Islands

Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia

Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee

Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin

Arkansas, Louisiana, New Mexico, Oklahoma, Texas

Iowa, Kansas, Missouri, Nebraska

Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming

Arizona, California, Hawaii, Nevada, American Samoa, Trust Territories of the Pacific, Guam, Northern Marianas

Alaska, Idaho, Oregon, Washington

State Water Supply Agencies

Water Supplies Section
Connecticut Department of
Health Services
150 Washington Street
Hartford, CT 06106
(203) 566-1253

Division of Water Supply
Dept. of Environmental
Protection
One Winter Street
Boston, MA 02108
(617) 292-5529

Division of Health
Engineering, Maine Dept. of
Human Services
State House (STA 10)
Augusta, ME 04333
(207) 287-2070

Water Supply Engineering
Bureau, Department of
Environmental Services
6 Hazen Drive, P.O. Box 95
Concord, NH 03302
(603) 271-3503

Division of Drinking Water
Quality, Rhode Island Dept.
of Health
75 Davis St., Cannon Bldg.
Providence, RI 02908
(401) 277-6867

Water Supply Program
Vermont Department of
Environmental Conservation
103 South Main Street
Waterbury, VT 05671
(802) 241-3400

Bureau of Safe Drinking
Water, NJ Dept. of
Environmental Protection
P.O. Box CN-426
Trenton, NJ 06825
(609) 292-5550

Bureau of Public Water Supply
Protection
New York Department of Health
2 University Place, Room 406
Albany, NY 12203-3313
(518) 458-6731

Water Supply Supervision
Program
Puerto Rico Dept. of Health
P.O. Box 70184
San Juan, PR 00936
(809) 754-6010

Planning & Natural Resources
Government of Virgin Islands
Nifky Center
Room 231
St. Thomas, VI 00802
(809) 774-3320

Public Water Systems Supervision
Program, Division of Public Health
Cooper Building, P.O. Box 637,
Federal & Water Streets
Dover, DE 19903
(302) 739-5410

Water Hygiene Branch
Department of Consumer and
Regulatory Affairs
2100 Martin Luther King Ave.
Washington, DC 20020
(202) 404-1120

Water Supply Program
Maryland Department of
Environment
2500 Broening Highway
Dunkalk, MD 21224
(410) 631-3702

Division of Drinking Water
Management, Dept of Environmental
Resources
P.O. Box 8467
Harrisburg, PA 17107
(717) 787-9035

Division of Water Supply
Engineering
Virginia Dept. of Health
1500 East Main Street
Richmond, VA 23219
(804) 786-1766

Office of Environmental
Health Services
815 Quarrier Street
Suite 418
Charleston, WV 25301
(304) 558-2981

Water Supply Branch
Dept. of Environmental
Management
1751 W.L. Dickinson Drive
Montgomery, AL 36130
(205) 271-7773

Drinking Water Section
Department of Environmental
Protection, Twin Towers
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(904) 487-1762

Drinking Water Program
Environmental Protection
Division
205 Butler Street SE
Atlanta, GA 30334
(404) 651-5154

Division of Water
Drinking Water Branch
Frankfort Office Park
14 Reilly Road
Frankfort, KY 40601
(502) 564-3410

Division of Water Supply
MS Department of Health
Office U-232, P.O. Box 1700
2423 N. State Street
Jackson, MS 39215-1700
(601) 960-7518

Public Water Supply Sec.
Div. of Environmental Health
Dept. of Environment,
Health & Natural Resources
P.O. Box 27687
Raleigh, NC 27611-7687
(919) 733-2321

Bureau of Drinking Water
Protection, Dept. of Health
and Environmental Control
2600 Bull Street
Columbia, SC 29201
(803) 734-5310

Division of Water Supply
Tennessee Department of
Environment & Conservation
401 Church Street
Nashville, TN 37243-1549
(615) 532-0191

Division of Public Water
Supplies
Illinois EPA
2200 Churchill Road
Springfield, IL 62794-9276
(217) 785-8653

Drinking Water Branch
Office of Water Management
IN Dept. of Envir. Mgmt.
100 North Senate Avenue
Indianapolis, IN 46206-6015
(317) 233-4222

Division of Water Supply
Michigan Department of
Public Health
P.O. Box 30195
Lansing, MI 48909
(517) 335-8326

Drinking Water Protection
Minnesota Department of
Health
925 Delaware ST. SE
Minneapolis, MN 55459
(612) 627-5133

Division of Ground & Drinking
Waters, Ohio Environmental
Protection Agency
P.O. Box 1049
1800 WaterMark Drive
Columbus, OH 43266-1049
(614) 644-2752

Bureau of Water Supply
Department of Natural
Resources
P.O. Box 7921
Madison, WI 53707
(608) 267-7651

Division of Engineering
Arkansas Dept. of Health
Mail Slot 37
4815 West Markham Street
Little Rock, AR 72205-3867
(501) 661-2623

Office of Public Health
Louisiana Dept. of Health
and Hospitals
P.O. Box 60630
New Orleans, LA 70160
(504) 568-5105

Drinking Water Section
New Mexico Health and
Environment Department
1190 St. Francis Drive
Santa Fe, NM 87503
(505) 827-2778

Water Quality Programs
Department of Environmental
Quality
1000 NE Tenth Street
Oklahoma City, OK 73117
(405) 271-5205

Water Utilities Division
Natural Resource Conservation
Commission
P.O. Box 13087
Austin, TX 78711
(512) 908-6930

Environmental Protection Div.
Dept. of Natural Resources
Water Quality Bureau
Wallace State Office Building
900 East Grand Avenue
Des Moines, IA 50319
(515) 281-8869

Public Water Supply Section
Kansas Dept. of Health and
the Environment
Forbes Field, Building 740
Topeka, KS 66620
(913) 296-5503

Public Drinking Water Program
Division of Environmental
Quality
P.O. Box 176
Jefferson City, MO 65102
(314) 751-5331

Division of Drinking Water
and Environmental Sanitation
NE Department of Health
301 Centennial Mall South
Lincoln, NE 68509
(402) 471-2541 or 0510

Drinking Water Program
WQCD-DW-B2
CO Department of Health
4300 Cherry Creek Drive So.
Denver, CO 80222
(303) 692-3546

Water Quality Bureau
Department of Health and
Environmental Sciences
Cogswell Bldg, Room A206
Helena, MT 59620
(406) 444-2406

Division of Water Supply
and Pollution Control
State Dept. of Health
1200 Missouri Avenue
Bismarck, ND 58502
(701) 221-5225

Office of Drinking Water
Department of Water and
Natural Resources
523 Capital Ave./Foss Bldg.
Pierre, SD 57501
(605) 773-3754

Division of Drinking Water
Utah Department of Envir-
onmental Quality
288 North 1460 West
Salt Lake City, UT 84114
(801) 538-6159

Water Quality Division
Dept. of Environmental
Quality
Herschler Bldg., 4thFloor
Cheyenne, WY 82002
(307) 777-7781

Compliance Section
Office of Water Quality
Room 200
3033 North Central
Phoenix, AZ 85001
(602) 207-4617

Division of Drinking Water
and Environmental Mgmt.
CA Department of Health
Services, Room 692
714 P Street
Sacramento, CA 95814
(916) 323-6111

Environmental Management
Division
Department of Health
P.O. Box 3378
Honolulu, HI 96801
(808) 586-4304

Public Health Engineering
NV Department of Human
Resources, Consumer Health
505 East King Street, Rm 103
Carson City, NV 89710
(702) 687-6615

Guam Environmental Protection
Agency
Government of Guam
130 Rojas Street/Harmon Plaza
Harmon, Guam 96911
(671) 646-8863

Division of Environmental Quality
Commonwealth of the Northern
Mariana Islands
P.O. Box 1304
Saipan, CM 96950
(670) 234-6114

Environmental Protection
Agency
Office of the Governor
American Samoa
Pago Pago, American
Samoa 96799
(No number available)

Palau Environmental Quality
Protection Board
Republic of Palau
P.O. Box 100
Koror, Palau 96940
(No number available)

Alaska Drinking Water Program
Wastewater & Water Treatment
Environmental Conservation Dept.
410 Willoughby
Juneau, AK 99801
(907) 465-5316

Drinking Water Program
Div. of Environmental Quality
Department of Health & Welfare
1410 North Hilton
Boise, ID 83706
(208) 334-5860

Drinking Water Program
Health Division
Dept. of Human Resources
800 Northeast Oregon Street
Portland, OR 97214-0450
(503) 731-4010

Drinking Water Division
Department of Health
Airdustrial Center
Building #3
P.O. Box 47822
Olympia, WA 98504-7822
(206) 753-1280



United States
Environmental Protection Agency
(4601)
Washington, DC 20460

Official Business
Penalty for Private Use
\$300