Diagnose Your Water

and find technologies to treat it properly

If you think there may be something wrong with your water but you don't know what may be causing the problem, you came to the right place.

This page will help you narrow down the possible culprits by choosing from some common Symptoms and their Characteristics.

Once narrowed down, you will find potential treatments and solutions. The information in this section is presented to you based on guidelines obtained from the WQA (Water Quality Association)

Color

- Blue/Green
  Matching Contaminant(s): Copper
- Dark brown/Black
  Matching Contaminant(s): Manganese
- Reddish/Orange
  Matching Contaminant(s): Iron

Deposits

- Soap scum, Bathtub rings
  Matching Contaminant(s): Hard Water (measured as Calcium Carbonate,$CaCO_3$)
- Whitish scale
  Matching Contaminant(s): Hard Water (measured as Calcium Carbonate,$CaCO_3$)

Smells

- Like Bleach
  Matching Contaminant(s): Chlorine
- Like Fish
  Matching Contaminant(s): Barium, Cadmium
- Like Rotten Eggs
  Matching Contaminant(s): Odor
- Like Sewage
  Matching Contaminant(s): Selenium (+6)
- Like Sweet Solvent

Matching Contaminant(s): MTBE (Methyl Tertiary Butyl Ether)

Spots

- Glassware, dishes, flatware
  Matching Contaminant(s): Hard Water (measured as Calcium Carbonate,$CaCO_3$), Total Dissolved Solids (TDS)
- My clothes
  Matching Contaminant(s): Hard Water (measured as Calcium Carbonate,$CaCO_3$)
- Spotting and mottling of teeth
  Matching Contaminant(s): Fluoride

Stains

- Blue/Green
  Matching Contaminant(s): Copper
- Brown/Red
  Matching Contaminant(s): Color, Iron
- Dark Brown/Black
  Matching Contaminant(s): Manganese
- Grey
  Matching Contaminant(s): Aluminum
- Red/Orange
  Matching Contaminant(s): Iron

Tastes

- Like Salt
  Matching Contaminant(s): Chloride, Sulfate
- Metallic
  Matching Contaminant(s): Iron, Zinc

Contaminant Treatment Overall Information

Copper

MCLG: 1.3 mg/L
MCL: 1.3 mg/L (action level)

WQA Recommended Treatment Methods:

- Cation Exchange (20% - 90%)
- Reverse Osmosis

- Distillation
- Electrodialysis
- Corrosion control
- Polyphosphate/Silicate feed

Potential Health Effects from Ingestion of Water:

- Gastrointestinal irritation

Sources of Contaminant in Drinking Water:

- Natural/industrial deposits
- Wood preservatives
- Plumbing

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Manganese

SMCL: 0.05mg/L (Total Manganese)

WQA Recommended Treatment Methods

- Filtration (Oxidizing filters)
- Cation Exchange
- Oxidation/Precipitation/Filtration
- Disinfection/Filtration

Effects on Water:

- Dark brown-black stains
- Bitter, metallic taste

Sources of Contaminant in Drinking Water:

- Natural deposits

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Iron

SMCL: 0.3mg/L (Total iron)

WQA Recommended Treatment Methods:

- Filtration(oxidizing filters)
- Cation Exchange
- Oxidation/Precipitation/Filtration
- Disinfection

Effects on Water:

- Rusty color
- Sediment
- Reddish or orange stains
- Metallic taste

Sources of Contaminant in Drinking Water:

- Natural Deposits

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Hard Water (measured as Calcium Carbonate,$CaCO_3$)

For more about this, Click Here

SMCL: No federal limit

- Soft: <17.1
- Slightly hard: 17.1 to 60
- Mod. hard: 60 to 120
- Hard: 120 to 180
- Very hard: 180 and above

Water hardness is measured in grains per gallon (GPG) or milligrams per liter (mg/l, equivalent to parts per million, or ppm). Water up to 1 GPG (or 17.1 mg/l) is considered soft, and water from 1 to 3.5 GPG is considered moderately hard. Water from 3.5 to 7 GPG is Hard Water, and from 7 to 10.5 GPG is Very Hard. A water softener's effectiveness depends on how hard the incoming water is. Water over 100 GPG may not be completely softened.

WQA Recommended Treatment Methods:

- Remove all calcium and magnesium ions with a cation exchange water softener

Effects on Water:

- Consumes soap and makes cleaning more difficult
- Whitish scale deposits
- Soap curd and lime scum residue

Sources of Contaminant in Drinking Water:

- Natural deposits causing calcium (limestone) and magnesium salts in raw water

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Chlorine

MCLG: 4 mg/L (P)*
MCL: 4 mg/L (P)*

WQA Recommended Treatment Methods:

- Activated Carbon
- Reverse Osmosis

Potential Health Effects from Ingestion of Water:

- Cancer

Sources of Contaminant in Drinking Water:

- Chemical added to disinfect municipal water

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Barium

MCLG: 2.0 mg/L
MCL: 2.0 mg/L

WQA Recommended Treatment Methods:

- Cation Exchange
- Reverse Osmosis
- Distillation
- Electrodialysis

Potential Health Effects from Ingestion of Water:

- Circulatory system effects

Sources of Contaminant in Drinking Water:

- Natural deposits
- Discharge of drilling wastes
- Discharge from metal refineries

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Cadmium

MCLG: 0.005 mg/L
MCL: 0.005 mg/L

WQA Recommended Treatment Methods

- Coagulation/Filtration

- Submicron Filtration
- Cation Exchange
- Reverse Osmosis
- Distillation
- Electrodialysis

Potential Health Effects from Ingestion of Water:

- Kidney effects

Sources of Contaminant in Drinking Water:

- Galvanized pipe corrosion
- Natural deposits
- Batteries
- Paints

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Odor

SMCL: 3 (threshold odor number)

WQA Recommended Treatment Methods:

- Activated Carbon
- Air Stripping
- Oxidation/Filtration
- Disinfection/Filtration

Effects on Water:

- Rotten egg
- Musty
- Garlic
- Chemical smell

Sources of Contaminant in Drinking Water:

- Chlorine
- Hydrogen sulfide
- Organic matter
- Gasoline contamination
- Methane gas
- Septic contamination

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Selenium (+6)

MCLG: 0.05 mg/L
MCL: 0.05 mg/L (total selenium)

WQA Recommended Treatment Methods:

- Anion Exchange
- Activated Alumina
- Reverse Osmosis
- Distillation
- Electrodialysis

Potential Health Effects from Ingestion of Water:

- Liver damage

Sources of Contaminant in Drinking Water:

- Natural deposits
- Mining
- Smelting
- Coal/Oil combustion

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MTBE (Methyl Tertiary Butyl Ether)
Not MBTE

SMCL: No federal limit

WQA Recommended Treatment Methods:

- Activated Carbon
- Air Stripping

Effects on Water:

- Sweet solvent odor at 0.020 mg/L
- Possible human carcinogen

Sources of Contaminant in Drinking Water:

- "Oxygenator" additive for reformulated gasoline

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Total Dissolved Solids (TDS)

SMCL: 500mg/L

WQA Recommended Treatment Methods:

- Reverse Osmosis
- Distillation
- Deionization by Ion Exchange
- Electrodialysis

Effects on Water:

- Hard water
- Deposits on glasses and fixtures

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Fluoride

MCLG: 4.0 mg/L
MCL: 4.0 mg/L

WQA Recommended Treatment Methods:

- Activated Alumina
- Bone Char
- Reverse Osmosis
- Distillation
- Electrodialysis

Potential Health Effects from Ingestion of Water:

- Skeletal & dental fluorosis

Sources of Contaminant in Drinking Water:

- Natural deposits
- Fertilizer
- Aluminum industries
- Water additive

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Color

SMCL: 15 (color units)

WQA Recommended Treatment Methods:

- Anion Exchange
- Activated Carbon
- Filtration

- Chlorination
- Reverse Osmosis
- Distillation
- Ozonation

Effects on Water:

- Visible tint

Sources of Contaminant in Drinking Water:

- Tannins
- Natural deposits
- Iron
- Copper
- Manganese

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Aluminum

SMCL: 0.05 to 0.2mg/L depending on case-by-case circumstances

WQA Recommended Treatment Methods

- Cation Exchange
- Reverse Osmosis
- Distillation
- Ultrafiltration
- Deionization

Effects on Water:

- Colored or tinted water

Sources of Contaminant in Drinking Water:

- Alum coagulation treatment
- Natural deposits

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Chloride

SMCL: 250mg/L

WQA Recommended Treatment Methods:

- Reverse Osmosis
- Distillation

- Anion Exchange
- Electrodialysis
- Deionization

Effects on Water:

- Salty taste

Sources of Contaminant in Drinking Water:

- Natural deposits

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Sulfate

MCLG: 500 mg/L (proposed standard)
MCL: 500 mg/L (proposed standard)

WQA Recommended Treatment Methods

- Anion Exchange
- Reverse Osmosis
- Distillation
- Electrodialysis

Potential Health Effects from Ingestion of Water:

- Diarrhea

Sources of Contaminant in Drinking Water:

- Natural deposits

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Zinc

SMCL: 5mg/L

WQA Recommended Treatment Methods:

- Reverse Osmosis
- Distillation
- Cation Exchange
- Electrodialysis

Effects on Water:

- Metallic taste

Sources of Contaminant in Drinking Water:

- Industrial wastes
- Natural deposits

NOTE: Even if you did not find any symptom, it would be a good idea to have your water tested. This way, you would be assured that your water IS indeed safe.

WQA (Water Quality Association)

The Water Quality Association is the international trade association representing the household, commercial, industrial, and small community water treatment industry.

Water Quality Association Web Site

WQA maintains a close dialogue with other organizations representing different aspects of the water industry in order to best serve consumers, government officials, and industry members.

Lots of info in this section is based on the EPA Drinking Water Standards.

WQA is a resource of information, of product testing, and professional certification for all water users.

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MCLG = Maximum Contaminant Level Goal.
Established at the level at which no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin or safety; expressed in milligrams per liter (mg/L) unless otherwise specified.

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MCL = Maximum Contaminant Level.
established as close to the MCLG as feasible, taking into consideration costs and treatment techniques applicable at public water systems; expressed in milligrams per liter unless otherwise specified.

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SMCL = Secondary Maximum Contaminant Levels.
Specifies the maximum contaminant levels which, in the judgement of the Administrator, are requisite to protect the public welfare; expressed in milligrams per liter unless otherwise specified.

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Is anything wrong with hard water?

The answer would be Yes and No...

But first, a small foreword: Hard water is found in 85 percent of all homes' water supplies. Most of the world's water supply comes from underground and when it travels through the ground, it runs through dirt and rocks and often picks up minerals such as calcium, lead, and iron. That's what makes water ''hard.'' This is water that is heavier than softened water and contains more minerals.

What's wrong with hard water?

Hard water can cause problems on several fronts. First, it can clog your appliances. Using hard water in your dishwasher or coffeemaker can mean a build up of mineral deposits. That buildup can mean your appliance has to work harder to properly pump water. Hard water can also mean your dishes, clothes, and body don't get as clean. Hard water doesn't lather up as well, and thus, you have a more difficult time cleaning. In addition, hard water can leave a sticky film on your tiled bathroom, in your bathtub and on you. Other than that, don't be fooled by con artists: there are no health risks involved by using hard water. Period.

How can you soften your home's water?

In order to soften the water in your home, you'll have to use a process called ion exchange water softening. You can do this by permanently installing water softening equipment or by hiring a water softening service to bring softened water to your home each week.

The ion exchange process happens when water flows through a bed of resin. The hard water's calcium and other mineral deposits are replaced with sodium ions, which softens the water.

If you install a permanent water softener, you'll buy a unit that will come in a tank, and you do your own resin regeneration. Many people often find this to be economical and convenient. Typically, homeowners will choose this route, while renters who may not wish to invest in more permanent equipment will choose to buy water.

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Hot weather and poor hydration can lead to disaster, so be sure you and yours drink&more ►

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Longtime WQA of Wisconsin member and former president Paul A. Maher&more

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Water Quality Association: The Water Quality Association

Mon, May 24, 2004 // Updated Mon, May 24, 2004

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Water Quality Association
International Headquarters & Laboratory
4151 Naperville Road
Lisle, IL 60532-3696
USA
630 505 0160, Fax 630 505 9637
info@wqa.org, www.wqa.org

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- Water Infrastructure Security

List of Drinking Water Contaminants & MCLs

National Primary Drinking Water Regulations

National Primary Drinking Water Regulations (NPDWRs or primary standards) are legally enforceable standards that apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water. Vist the list of regulated contaminants with links for more details.

- **List of Contaminants & their Maximum Contaminant Level (MCLs)**
- Setting Standards for Safe Drinking Water to learn about EPA's standard-setting process
- EPA's Regulated Contaminant Timeline (PDF File)
- National Primary Drinking Water Regulations EXIT disclaimer - The complete regulations regarding these contaminants availible from the Code of Federal Regulations Website

National Secondary Drinking Water Regulations

National Secondary Drinking Water Regulations (NSDWRs or secondary standards) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

- **List of National Secondary Drinking Water Regulations**
- National Secondary Drinking Water Regulations EXIT disclaimer - The complete regulations regarding these contaminants availible from the

Code of Federal Regulations Website.

Unregulated Contaminants

This list of contaminants which, at the time of publication, are not subject to any proposed or promulgated national primary drinking water regulation (NPDWR), are known or anticipated to occur in public water systems, and may require regulations under SDWA. For more information check out the list, or vist the Drinking Water Contaminant Candidate List (CCL) website.

- **List of Unregulated Contaminants**
- Drinking Water Contaminant Candidate List (CCL) Website
- Unregulated Contaminant Monitoring Rule (UCMR)

List of Contaminants & their MCLs

EPA 816-F-02-013
July 2002

Microorganisms | Disinfectants | Disinfection Byproducts | Inorganic Chemicals | Organic Chemicals | Radionuclides

- The links provided below are to either Consumer Fact Sheet, Rule Implementation websites, or PDF files
- Alaphabetical Version of this chart in PDF format (EPA 816-F-03-016 June 2003 - 396 K PDF FILE)

Microorganisms

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Cryptosporidium	zero	TT [3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and fecal animal waste
Giardia lamblia	zero	TT[3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste
Heterotrophic plate count	n/a	TT[3]	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment
Legionella	zero	TT[3]	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems

Total Coliforms (including fecal coliform and *E. Coli*)	zero	5.0%[4]	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present[5]	Coliforms are naturally present in the environment; as well as feces; fecal coliforms and *E. coli* only come from human and animal fecal waste.
Turbidity	n/a	TT[3]	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites and some bacteria. These organisms can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff
Viruses (enteric)	zero	TT[3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste

Disinfection Byproducts

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Bromate	zero	0.010	Increased risk of cancer	Byproduct of drinking water disinfection
Chlorite	0.8	1.0	Anemia; infants & young children: nervous system effects	Byproduct of drinking water disinfection
Haloacetic acids (HAA5)	n/a[6]	0.060	Increased risk of cancer	Byproduct of drinking water disinfection
Total Trihalomethanes (TTHMs)	none[7] ---------- n/a[6]	0.10 ---------- 0.080	Liver, kidney or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection

Disinfectants

Contaminant	MRDLG[1] (mg/L)[2]	MRDL[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Chloramines (as Cl_2)	MRDLG=4[1]	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort, anemia	Water additive used to control microbes
Chlorine (as Cl_2)	MRDLG=4[1]	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort	Water additive used to control microbes
Chlorine dioxide (as ClO_2)	MRDLG=0.8[1]	MRDL=0.8[1]	Anemia; infants & young children: nervous system effects	Water additive used to control microbes

Inorganic Chemicals

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Antimony	0.006	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	0[7]	0.010 as of 01/23/06	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards, runoff from glass & electronicsproduction wastes
Asbestos (fiber >10 micrometers)	7 million fibers per liter	7 MFL	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits
Barium	2	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beryllium	0.004	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries

Cadmium	0.005	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
Chromium (total)	0.1	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits
Copper	1.3	TT[8]; Action Level=1.3	Short term exposure: Gastrointestinal distress Long term exposure: Liver or kidney damage People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level	Corrosion of household plumbing systems; erosion of natural deposits
Cyanide (as free cyanide)	0.2	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
Fluoride	4.0	4.0	Bone disease (pain and tenderness of the bones); Children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories
Lead	zero	TT[8]; Action Level=0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits

Mercury (inorganic)	0.002	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands
Nitrate (measured as Nitrogen)	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (measured as Nitrogen)	1	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium	0.05	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines
Thallium	0.0005	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories

Organic Chemicals

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water

Acrylamide	zero	TT[9]	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/wastewater treatment
Alachlor	zero	0.002	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops
Atrazine	0.003	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops
Benzene	zero	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills
Benzo(a)pyrene (PAHs)	zero	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines
Carbofuran	0.04	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa
Carbon tetrachloride	zero	0.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities
Chlordane	zero	0.002	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide
Chlorobenzene	0.1	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories

2,4-D	0.07	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops
Dalapon	0.2	0.2	Minor kidney changes	Runoff from herbicide used on rights of way
1,2-Dibromo-3-chloropropane (DBCP)	zero	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards
o-Dichlorobenzene	0.6	0.6	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories
p-Dichlorobenzene	0.075	0.075	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories
1,2-Dichloroethane	zero	0.005	Increased risk of cancer	Discharge from industrial chemical factories
1,1-Dichloroethylene	0.007	0.007	Liver problems	Discharge from industrial chemical factories
cis-1,2-Dichloroethylene	0.07	0.07	Liver problems	Discharge from industrial chemical factories
trans-1,2-Dichloroethylene	0.1	0.1	Liver problems	Discharge from industrial chemical factories
Dichloromethane	zero	0.005	Liver problems; increased risk of cancer	Discharge from drug and chemical factories
1,2-Dichloropropane	zero	0.005	Increased risk of cancer	Discharge from industrial chemical factories
Di(2-ethylhexyl) adipate	0.4	0.4	Weight loss, liver problems, or possible reproductive difficulties.	Discharge from chemical factories

Di(2-ethylhexyl) phthalate	zero	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories
Dinoseb	0.007	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables
Dioxin (2,3,7,8-TCDD)	zero	0.00000003	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories
Diquat	0.02	0.02	Cataracts	Runoff from herbicide use
Endothall	0.1	0.1	Stomach and intestinal problems	Runoff from herbicide use
Endrin	0.002	0.002	Liver problems	Residue of banned insecticide
Epichlorohydrin	zero	TT[9]	Increased cancer risk, and over a long period of time, stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals
Ethylbenzene	0.7	0.7	Liver or kidneys problems	Discharge from petroleum refineries
Ethylene dibromide	zero	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries
Glyphosate	0.7	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use
Heptachlor	zero	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide
Heptachlor epoxide	zero	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor

Hexachlorobenzene	zero	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories
Hexachlorocyclopentadiene	0.05	0.05	Kidney or stomach problems	Discharge from chemical factories
Lindane	0.0002	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, gardens
Methoxychlor	0.04	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
Oxamyl (Vydate)	0.2	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes
Polychlorinated biphenyls (PCBs)	zero	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals
Pentachlorophenol	zero	0.001	Liver or kidney problems; increased cancer risk	Discharge from wood preserving factories
Picloram	0.5	0.5	Liver problems	Herbicide runoff
Simazine	0.004	0.004	Problems with blood	Herbicide runoff
Styrene	0.1	0.1	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills

Tetrachloroethylene	zero	0.005	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners
Toluene	1	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories
Toxaphene	zero	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle
2,4,5-TP (Silvex)	0.05	0.05	Liver problems	Residue of banned herbicide
1,2,4-Trichlorobenzene	0.07	0.07	Changes in adrenal glands	Discharge from textile finishing factories
1,1,1-Trichloroethane	0.20	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane	0.003	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories
Trichloroethylene	zero	0.005	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories
Vinyl chloride	zero	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories
Xylenes (total)	10	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories

Radionuclides

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water

Alpha particles	none[7] ---------- zero	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation
Beta particles and photon emitters	none[7] ---------- zero	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation
Radium 226 and Radium 228 (combined)	none[7] ---------- zero	5 pCi/L	Increased risk of cancer	Erosion of natural deposits
Uranium	zero	30 ug/L as of 12/08/03	Increased risk of cancer, kidney toxicity	Erosion of natural deposits

Notes

[1] Definitions:
Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
Maximum Residual Disinfectant Level Goal (MRDLG) - The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
Treatment Technique - A required process intended to reduce the level of a contaminant in drinking water.

[2] Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million.

[3] EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:

- Cryptosporidium (as of1/1/02 for systems serving >10,000 and 1/14/05 for systems serving <10,000) 99% removal.

- *Giardia lamblia:* 99.9% removal/inactivation
- Viruses: 99.99% removal/inactivation
- *Legionella:* No limit, but EPA believes that if *Giardia* and viruses are removed/inactivated, *Legionella* will also be controlled.
- Turbidity: At no time can turbidity (cloudiness of water) go above 5 nephelolometric turbidity units (NTU); systems that filter must ensure that the turbidity go no higher than 1 NTU (0.5 NTU for conventional or direct filtration) in at least 95% of the daily samples in any month. As of January 1, 2002, turbidity may never exceed 1 NTU, and must not exceed 0.3 NTU in 95% of daily samples in any month.
- HPC: No more than 500 bacterial colonies per milliliter.
- Long Term 1 Enhanced Surface Water Treatment (Effective Date: January 14, 2005); Surface water systems or (GWUDI) systems serving fewer than 10,000 people must comply with the applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, Cryptosporidium removal requirements, updated watershed control requirements for unfiltered systems).
- Filter Backwash Recycling; The Filter Backwash Recycling Rule requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.

[4] more than 5.0% samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or *E. coli* if two consecutive TC-positive samples, and one is also positive for *E.coli* fecal coliforms, system has an acute MCL violation.

[5] Fecal coliform and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Disease-causing microbes (pathogens) in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. These pathogens may pose a special health risk for infants, young children, and people with severely compromised immune systems.

[6] Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:

- Trihalomethanes: bromodichloromethane (zero); bromoform (zero); dibromochloromethane (0.06 mg/L). Chloroform is regulated with this group but has no MCLG.
- Haloacetic acids: dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L). Monochloroacetic acid, bromoacetic acid, and dibromoacetic acid are regulated with this group but have no MCLGs.

[7] MCLGs were not established before the 1986 Amendments to the Safe Drinking Water Act. Therefore, there is no MCLG for this contaminant.

[8] Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

[9] Each water system must certify, in writing, to the state (using third-party or manufacturer's certification) that when acrylamide and epichlorohydrin are used in

drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows:

- Acrylamide = 0.05% dosed at 1 mg/L (or equivalent)
- Epichlorohydrin = 0.01% dosed at 20 mg/L (or equivalent)

National Secondary Drinking Water Regulations

National Secondary Drinking Water Regulations (NSDWRs or secondary standards) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

- For more information, read Secondary Drinking Water Regulations: Guidance for Nuisance Chemicals.

Contaminant	Secondary Standard
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

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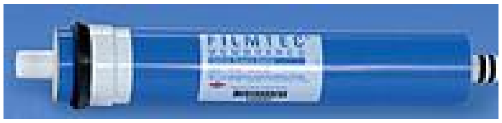
Filmtec Membranes 	**MatrikX Carbon Filters**	**OmniPure Filters** 
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Water Filtration Main Page

United States Environmental Protection Agency
Office of Water (4606)
EPA 816-F-01-011
May 2001
www.epa.gov/safewater

Interim Enhanced Surface Water Treatment Rule: A Quick Reference Guide

Overview of the Rule

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

Major Provisions

Regulated Contaminants

Cryptosporidium	‣ Maximum contaminant level goal (MCLG) of zero. ‣ 99 percent (2-log) physical removal for systems that filter. ‣ Include in watershed control program for unfiltered systems.
Turbidity Performance Standards	Conventional and direct filtration combined filter effluent: ‣ £ 0.3 nephelometric turbidity units (NTU) in at least 95 percent of measurements taken each month. ‣ Maximum level of 1 NTU.

Turbidity Monitoring Requirements (Conventional and Direct Filtration)

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

Additional Requirements

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

For additional information on the IESWTR

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

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

Profiling and Benchmarking

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

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

Critical Deadlines and Requirements

For Drinking Water Systems	
February 16, 1999	Construction of uncovered finished water reservoirs is prohibited.
March 1999	Public water systems lacking ICR or other occurrence data begin 4 quarters of applicability monitoring for TTHM and HAA5 to determine if disinfection profiling is necessary.
April 16, 1999	Systems that have 4 consecutive quarters of HAA5 occurrence data that meet the TTHM monitoring requirements must submit data to the state to determine if disinfection profiling is necessary.
December 31, 1999	Public water systems with ICR data must submit it to states to determine if disinfection profiling is necessary.
April 1, 2000	Public water systems must begin developing a disinfection profile if their annual average (based on 4 quarters of data) for TTHM is greater than or equal to 0.064 mg/L or HAA5 is greater than or equal to 0.048 mg/L.
March 31, 2001	Disinfection profile must be complete.
January 1, 2002	Surface water systems or ground water under the direct influence of surface water systems serving 10,000 or more people must comply with all IESWTR provisions (e.g., turbidity standards, individual filter monitoring).
For States	
December 16, 2000	States submit IESWTR primacy revision applications to EPA (triggers interim primacy).
January 2002	States begin first round of sanitary surveys.
December 16, 2002	Primacy extension deadline - all states with an extension must submit primacy revision applications to EPA.
December 2004	States must complete first round of sanitary surveys for community water systems.
December 2006	States must complete first round of sanitary surveys for noncommunity water systems.

Public Health Benefits

Implementation of the IESWTR will result in . . .	• Increased protection against gastrointestinal illnesses from *Cryptosporidium* and other pathogens through improvements in filtration. • Reduced likelihood of endemic illness from *Cryptosporidium* by 110,000 to 463,000 cases annually. • Reduced likelihood of outbreaks of cryptosporidiosis.
Estimated impacts of the IESWTR include . . .	• National total annualized cost: $307 million • 92 percent of households will incur an increase of less than $1 per month. • Less than 1 percent of households will incur an increase of more than $5 per month (about $8 per month).

U.S. Environmental Protection Agency

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Annual listing of fish advisories issued Aug 24 - EPA released its 12th annual summary of information on locally-issued fish advisories and safe-eating guidelines. The number of advisories issued continues to rise as states expand their testing programs.
News release | More ... | comunicado de prensa

Los Angeles to pay $2 billion for sewage spills Aug 6 - The sewage case is one of the largest in history, with more than 4500 spills over past decade. Under the settlement, the city will rebuild some sewer lines and clean others, increase capacity, and plan for future expansion.
News release

Mobil to pay over $5.5 million for Clean Water Act violations on Navajo lands Aug 3 - Mobil will reduce the number of oil spills and build a drinking water pipeline to provide water to 17 remote residences located on the oil production fields. Currently, local residents drive up to an hour for drinking water.
News release

Largest-ever grant to study health effects of air pollution July 29 - Administrator Mike Leavitt awarded the University of Washington a $30 million grant to study the connection between air pollution and cardiovascular disease. The grant is the largest ever awarded by the EPA for scientific research.
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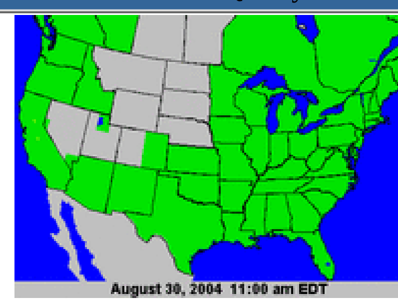
Children and Lead

Information for parents of children exposed to lead in drinking water, paint, or other sources.

Your Air Quality



Good	Moderate	Unhealthy for Sensitive Groups
Unhealthy	Very Unhealthy	Hazardous
No data available		

More information

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National	Great Lakes Executive Order
Consumer	First hybrid SUV certified for sale in US
Northeast	New England's Best Workplaces for Commuters
CA	United Airlines to resolve hazardous waste violations
DC	New safeguards for lead in drinking water
ID	Erosion control complaint against Transportation Dept
MA	PCB Cleanup Facility opens in New Bedford Harbor
ME	EPA seeks air penalties from Maine Military Authority
NH	$4 Million for cleanup at NH Plating Superfund site
NJ	"Coastal Crusader" guards NJ beaches
NY	2-story lab demolished at Superfund site
NY	Clean School Bus grants to benefit 50,000 kids
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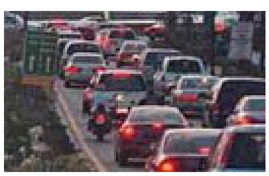

More Americans than ever are hitting the road this summer. Conserving fuel is increasingly important to our environment and, with higher gas prices at the pump, our wallets as well. Drivers can take a number of steps to minimize trips to the fuel pump and to protect the air we breathe: drive wisely; maintain your car; plan trips in advance; and don t top off your gas tank.
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Clean Air Rules of 2004

The Clean Air Rules are a suite of actions that will dramatically improve America's air quality. Three of the rules specifically address the transport of pollution across state borders. These rules provide national tools to achieve significant improvement in air quality and the associated benefits of improved health, longevity and quality of life for all Americans.
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Being Sunwise: What ratio of Americans will develop skin cancer in their lifetime?

a. One in five
b. One in ten
c. One in a hundred
d. One in a thousand

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Previous questions

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Spills or releases of oil or chemicals should be reported immediately to the EPA Spill Hotline: 800-424-8802.

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Public Meeting Summaries : : Open For Comment

August 27, 2004

- **Drinking Water Federal Register Notice:**
  - **Radionuclides**
    - National Primary Drinking Water Regulations: Analytical Method for Uranium
    - Withdrawal of Direct Final Rule; National Primary Drinking Water Regulations: Analytical Method for Uranium

August 25, 2004

- **Water Security**: New dynamically driven water security web site live.

August 20, 2004

- **Drinking Water Federal Register Notice:**
  - **National Drinking Water Advisory Council - Water Security Working Group**:
    - National Drinking Water Advisory Council's Water Security Working Group Meeting Announcement

August 10, 2004

- **Drinking Water Federal Register Notice:**
  - **Lead and Copper Rule Review**:
    - Lead and Copper Rule: Expert Panel Workshop on Public Education and Risk Communication

July 29, 2004

- **Drinking Water Federal Register Notice:**
  - **Contaminate Candidate List**: Notice of a Public Meeting To Discuss Regulatory Determinations for the Second Contaminant Candidate List (CCL 2) and

Updates for Unregulated Contaminant Monitoring and the CCL 3

July 22, 2004

- Source Water Protection and Underground Storage Tanks: Partnership Opportunity

July 21, 2004

- **Lead and Copper Rule Review**: School Responses (ALL ABOUT PDF FILES)
    - Summary of State Responses (387 K PDF FILE, 29 pgs)
        - Responses by State
            - Alabama through Nebraska (16 M PDF FILE, 136 pgs)
            - Nevada through Wyoming (8 M PDF FILE, 86 pgs)

July 12, 2004

- Filter Backwash Recycling Rule: Implementation Guidance for the Filter Backwash Recycling Rule

June 30, 2004

- **Safe Drinking Water Hotline**: 2003 Annual Report posted

June 29, 2004

- **Drinking Water Federal Register Notices**
    - Lead and Copper Rule: National Primary Drinking Water Regulations: Minor Corrections and Clarification to Drinking Water Regulations; National Primary Drinking Water Regulations for Lead and Copper

June 23, 2004

- **Drinking Water Federal Register Notices**
    - National Drinking Water Advisory Council
        - Water Security: National Drinking Water Advisory Council's Water Security Working Group Meeting Announcement
        - National Drinking Water Advisory Council; Request for Nominations
- Announcement of Calculation of Tentative FY 2005 Allotments for the Drinking Water Infrastructure Grants Tribal Set-Aside Program

- Announcement of Calculation of Tentative FY 2005 Allotments for the Drinking Water Infrastructure Grants Territorial Set-Aside Program

June 22, 2004

- Webcast Training: Radionuclides and Arsenic Rules
    - Announcement (101 K PDF FILE, 1pg) (ALL ABOUT PDF FILES)
    - Agenda (1.3 MB PDF FILE, 2pgs) (ALL ABOUT PDF FILES)

June 21, 2004

- Underground Injection Control Program: Final: Study of Potential Impacts of Hydraulic Fracturing of Coalbed Methane Wells on Underground Sources of Drinking Water posted

June 4, 2004

- Publice Drinking Water Systems: FY2005 Grants to Support Public Water System Supervision Programs on Tribal Lands DRAFT Guidance

June 2, 2004

- **Drinking Water Federal Register Notices:**
    - National Primary Drinking Water Regulations: Analytical Method for Uranium - Direct final rule
    - National Primary Drinking Water Regulations: Analytical Method for Uranium - Proposed rule

June 1, 2004

- Underground Injection Control Program: FY 2004 UIC Tribal Grant Allotment by EPA Region

May 27, 2004

- Publice Drinking Water Systems: FY 2005 Public Water System Supervision (PWSS) State Program Grants - Guidance and Tentative Allotments

May 24, 2004

- **Drinking Water Federal Register Notices:**
    - Disinfectants/Disinfection By-Products, Chemical, and Radionuclides Rules Information Collection Rule (Renewal)
        - FR Notice
        - Open for comment by June 29, 2004

- Microbial Rules Information Collection Rule (Renewal)
  - FR Notice
  - Open for comment by June 29, 2004
- Public Water System Supervision Program Information Collection Rule (Renewal)
  - FR Notice
  - Open for comment by June 29, 2004

May 8, 2004

- Database: Drinking Water Research Information Network (DRINK) website is posted.

May 7, 2004

- Underground Injection Control: 2004 Grant Guidance Memo

May 4, 2004

- Lead and Copper Rule Data: 90th Percent Lead Level Information for Water Systems Serving MoreThan 50,000 People

April 27, 2004

- **Drinking Water Federal Register Notice**
  - National Drinking Water Advisory Council: Meeting of the full National Drinking Water Advisory Council

April 23, 2004

- **Drinking Water Federal Register Notice**
  - Meeting: Lead and Copper Rule; Expert Panel Workshops on Simultaneous Compliance and Monitoring Protocols

April 19, 2004

- Tribal Programs: The Notice of Availability of the Tribal Drinking Water Operator Certification Draft Final Guidelines AND the Tribal Drinking Water Operator Certification Program Draft Final Guidelines (PDF, 294KB) (EPA 816-D-04 -001, March 2004)

April 16, 2004

- Drinking Water State Revolving Fund Program: FY 2004 Allotments

April 15, 2004

- Public Water System Supervision (PWSS) Grant Program:

FY 2004 Allotments

April 12, 2004

- **Drinking Water Federal Register Notice**
  - Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; National Primary Drinking Water Regulations; and National Secondary Drinking Water Regulations; Analysis and Sampling Procedures - Proposed Rule - Proposes additions, revisions and withdrawal to drinking water analytical methods
- Data & Database Reports: 2003 Data Analysis and Action Plan EPA 816-R-03-021 March 2004 (PDF 314 KB, 46 pgs)

April 8, 2004

- Public Drinking Water Systems: Standardized Monitoring Framework (EPA 816-F-04-010 March 2004)

April 2, 2004

- **Drinking Water Federal Register Notice**
  - **Contaminant Candidate List :** Drinking Water Contaminant Candidate List 2; Notice - read the Federal Register notice here

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Drinking Water For Kids!

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We welcome questions and comments about drinking water and about this web site.

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Office of Ground Water and Drinking Water (4601)

Mailing address:
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460-0003

Street address:
EPA East
1201 Constitution Ave, NW
Washington, DC 20460-0003

Phone: 202-564-3750
Fax: 202-564-3753 (Director's office)
Fax: 202-564-3751 (Drinking Water Protection Division)
Fax: 202-564-3752 (Standards and Risk Management Division)

Technical Support Center:
U.S. EPA
26 Martin Luther King Drive
Cincinnati, Ohio 45268
Phone: 513-569-7948
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E-mail addresses for EPA staff take the form of lastname.firstname@epa.gov

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List of Drinking Water Contaminants & MCLs

National Primary Drinking Water Regulations

National Primary Drinking Water Regulations (NPDWRs or primary standards) are legally enforceable standards that apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water. Vist the list of regulated contaminants with links for more details.

- **List of Contaminants & their Maximum Contaminant Level (MCLs)**
- Setting Standards for Safe Drinking Water to learn about EPA's standard-setting process
- EPA's Regulated Contaminant Timeline (PDF File)
- National Primary Drinking Water Regulations EXIT disclaimer - The complete regulations regarding these contaminants availible from the Code of Federal Regulations Website

National Secondary Drinking Water Regulations

National Secondary Drinking Water Regulations (NSDWRs or secondary standards) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

- **List of National Secondary Drinking Water Regulations**

- National Secondary Drinking Water Regulations EXIT disclaimer - The complete regulations regarding these contaminants availible from the Code of Federal Regulations Website.

Unregulated Contaminants

This list of contaminants which, at the time of publication, are not subject to any proposed or promulgated national primary drinking water regulation (NPDWR), are known or anticipated to occur in public water systems, and may require regulations under SDWA. For more information check out the list, or vist the Drinking Water Contaminant Candidate List (CCL) website.

- **List of Unregulated Contaminants**
- Drinking Water Contaminant Candidate List (CCL) Website
- Unregulated Contaminant Monitoring Rule (UCMR)

List of Contaminants & their MCLs

EPA 816-F-02-013
July 2002

Microorganisms | Disinfectants | Disinfection Byproducts | Inorganic Chemicals | Organic Chemicals | Radionuclides

- The links provided below are to either Consumer Fact Sheet, Rule Implementation websites, or PDF files
- Alaphabetical Version of this chart in PDF format (EPA 816-F-03-016 June 2003 - 396 K PDF FILE)

Microorganisms

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Cryptosporidium	zero	TT [3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and fecal animal waste
Giardia lamblia	zero	TT[3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste
Heterotrophic plate count	n/a	TT[3]	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment

Legionella	zero	TT[3]	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems
Total Coliforms (including fecal coliform and *E. Coli*)	zero	5.0%[4]	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present[5]	Coliforms are naturally present in the environment; as well as feces; fecal coliforms and *E. coli* only come from human and animal fecal waste.
Turbidity	n/a	TT[3]	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites and some bacteria. These organisms can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff
Viruses (enteric)	zero	TT[3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste

Disinfection Byproducts

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Bromate	zero	0.010	Increased risk of cancer	Byproduct of drinking water disinfection
Chlorite	0.8	1.0	Anemia; infants & young children: nervous system effects	Byproduct of drinking water disinfection

Haloacetic acids (HAA5)	n/a[6]	0.060	Increased risk of cancer	Byproduct of drinking water disinfection
Total Trihalomethanes (TTHMs)	none[7] ---------- n/a[6]	0.10 ---------- 0.080	Liver, kidney or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection

Disinfectants

Contaminant	MRDLG[1] (mg/L)[2]	MRDL[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Chloramines (as Cl_2)	MRDLG=4[1]	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort, anemia	Water additive used to control microbes
Chlorine (as Cl_2)	MRDLG=4[1]	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort	Water additive used to control microbes
Chlorine dioxide (as ClO_2)	MRDLG=0.8[1]	MRDL=0.8[1]	Anemia; infants & young children: nervous system effects	Water additive used to control microbes

Inorganic Chemicals

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Antimony	0.006	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	0[7]	0.010 as of 01/23/06	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards, runoff from glass & electronicsproduction wastes
Asbestos (fiber >10 micrometers)	7 million fibers per liter	7 MFL	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits

Barium	2	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beryllium	0.004	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
Cadmium	0.005	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
Chromium (total)	0.1	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits
Copper	1.3	TT[8]; Action Level=1.3	Short term exposure: Gastrointestinal distress Long term exposure: Liver or kidney damage People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level	Corrosion of household plumbing systems; erosion of natural deposits
Cyanide (as free cyanide)	0.2	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
Fluoride	4.0	4.0	Bone disease (pain and tenderness of the bones); Children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories

Lead	zero	TT[8]; Action Level=0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits
Mercury (inorganic)	0.002	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands
Nitrate (measured as Nitrogen)	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (measured as Nitrogen)	1	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium	0.05	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines
Thallium	0.0005	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories

Organic Chemicals

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Acrylamide	zero	TT[9]	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/wastewater treatment
Alachlor	zero	0.002	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops
Atrazine	0.003	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops
Benzene	zero	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills
Benzo(a)pyrene (PAHs)	zero	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines
Carbofuran	0.04	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa
Carbon tetrachloride	zero	0.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities
Chlordane	zero	0.002	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide

Chlorobenzene	0.1	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories
2,4-D	0.07	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops
Dalapon	0.2	0.2	Minor kidney changes	Runoff from herbicide used on rights of way
1,2-Dibromo-3-chloropropane (DBCP)	zero	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards
o-Dichlorobenzene	0.6	0.6	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories
p-Dichlorobenzene	0.075	0.075	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories
1,2-Dichloroethane	zero	0.005	Increased risk of cancer	Discharge from industrial chemical factories
1,1-Dichloroethylene	0.007	0.007	Liver problems	Discharge from industrial chemical factories
cis-1,2-Dichloroethylene	0.07	0.07	Liver problems	Discharge from industrial chemical factories
trans-1,2-Dichloroethylene	0.1	0.1	Liver problems	Discharge from industrial chemical factories
Dichloromethane	zero	0.005	Liver problems; increased risk of cancer	Discharge from drug and chemical factories
1,2-Dichloropropane	zero	0.005	Increased risk of cancer	Discharge from industrial chemical factories

Di(2-ethylhexyl) adipate	0.4	0.4	Weight loss, liver problems, or possible reproductive difficulties.	Discharge from chemical factories
Di(2-ethylhexyl) phthalate	zero	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories
Dinoseb	0.007	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables
Dioxin (2,3,7,8-TCDD)	zero	0.00000003	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories
Diquat	0.02	0.02	Cataracts	Runoff from herbicide use
Endothall	0.1	0.1	Stomach and intestinal problems	Runoff from herbicide use
Endrin	0.002	0.002	Liver problems	Residue of banned insecticide
Epichlorohydrin	zero	TT[9]	Increased cancer risk, and over a long period of time, stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals
Ethylbenzene	0.7	0.7	Liver or kidneys problems	Discharge from petroleum refineries
Ethylene dibromide	zero	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries

Glyphosate	0.7	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use
Heptachlor	zero	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide
Heptachlor epoxide	zero	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor
Hexachlorobenzene	zero	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories
Hexachlorocyclopentadiene	0.05	0.05	Kidney or stomach problems	Discharge from chemical factories
Lindane	0.0002	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, gardens
Methoxychlor	0.04	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
Oxamyl (Vydate)	0.2	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes
Polychlorinated biphenyls (PCBs)	zero	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals

Pentachlorophenol	zero	0.001	Liver or kidney problems; increased cancer risk	Discharge from wood preserving factories
Picloram	0.5	0.5	Liver problems	Herbicide runoff
Simazine	0.004	0.004	Problems with blood	Herbicide runoff
Styrene	0.1	0.1	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills
Tetrachloroethylene	zero	0.005	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners
Toluene	1	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories
Toxaphene	zero	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle
2,4,5-TP (Silvex)	0.05	0.05	Liver problems	Residue of banned herbicide
1,2,4-Trichlorobenzene	0.07	0.07	Changes in adrenal glands	Discharge from textile finishing factories
1,1,1-Trichloroethane	0.20	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane	0.003	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories
Trichloroethylene	zero	0.005	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories
Vinyl chloride	zero	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories

Xylenes (total)	10	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories

Radionuclides

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Alpha particles	none[7] ---------- zero	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation
Beta particles and photon emitters	none[7] ---------- zero	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation
Radium 226 and Radium 228 (combined)	none[7] ---------- zero	5 pCi/L	Increased risk of cancer	Erosion of natural deposits
Uranium	zero	30 ug/L as of 12/08/03	Increased risk of cancer, kidney toxicity	Erosion of natural deposits

Notes

[1] Definitions:
Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
Maximum Residual Disinfectant Level Goal (MRDLG) - The level of a drinking water

disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
Treatment Technique - A required process intended to reduce the level of a contaminant in drinking water.

[2] Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million.

[3] EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:

- Cryptosporidium (as of1/1/02 for systems serving >10,000 and 1/14/05 for systems serving <10,000) 99% removal.
- *Giardia lamblia:* 99.9% removal/inactivation
- Viruses: 99.99% removal/inactivation
- *Legionella:* No limit, but EPA believes that if *Giardia* and viruses are removed/inactivated, *Legionella* will also be controlled.
- Turbidity: At no time can turbidity (cloudiness of water) go above 5 nephelolometric turbidity units (NTU); systems that filter must ensure that the turbidity go no higher than 1 NTU (0.5 NTU for conventional or direct filtration) in at least 95% of the daily samples in any month. As of January 1, 2002, turbidity may never exceed 1 NTU, and must not exceed 0.3 NTU in 95% of daily samples in any month.
- HPC: No more than 500 bacterial colonies per milliliter.
- Long Term 1 Enhanced Surface Water Treatment (Effective Date: January 14, 2005); Surface water systems or (GWUDI) systems serving fewer than 10,000 people must comply with the applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, Cryptosporidium removal requirements, updated watershed control requirements for unfiltered systems).
- Filter Backwash Recycling; The Filter Backwash Recycling Rule requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.

[4] more than 5.0% samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or *E. coli* if two consecutive TC-positive samples, and one is also positive for *E.coli* fecal coliforms, system has an acute MCL violation.

[5] Fecal coliform and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Disease-causing microbes (pathogens) in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. These pathogens may pose a special health risk for infants, young children, and people with severely compromised immune systems.

[6] Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:

- Trihalomethanes: bromodichloromethane (zero); bromoform (zero);

dibromochloromethane (0.06 mg/L). Chloroform is regulated with this group but has no MCLG.

- Haloacetic acids: dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L). Monochloroacetic acid, bromoacetic acid, and dibromoacetic acid are regulated with this group but have no MCLGs.

[7] MCLGs were not established before the 1986 Amendments to the Safe Drinking Water Act. Therefore, there is no MCLG for this contaminant.

[8] Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

[9] Each water system must certify, in writing, to the state (using third-party or manufacturer's certification) that when acrylamide and epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows:

- Acrylamide = 0.05% dosed at 1 mg/L (or equivalent)
- Epichlorohydrin = 0.01% dosed at 20 mg/L (or equivalent)

National Secondary Drinking Water Regulations

National Secondary Drinking Water Regulations (NSDWRs or secondary standards) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

- For more information, read Secondary Drinking Water Regulations: Guidance for Nuisance Chemicals.

Contaminant	Secondary Standard
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5

Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

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This page was generated on Monday, August 30, 2004

View the graphical version of this page at: http://www.epa.gov/OGWDW/mcl.html

U.S. Environmental Protection Agency

Water

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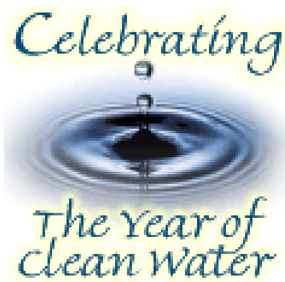

EXIT disclaimer

Acting Assistant Administrator Speeches & Testimonies

Current Information

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Highlights

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Ground Water & Drinking Water

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Water Science

Beach Watch , Analytical Test Methods , Drinking Water & Health Advisories , Human Health , Water Quality Criteria & Standards , Contaminated Sediments , Shellfish Protection , Fish & Wildlife Consumption Advisories , Effluent Guidelines , Water Quality Models

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U.S. Environmental Protection Agency

Ground Water & Drinking Water

Drinking Water and Health Basics

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Source Water Protection

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Drinking Water Academy

Safe Drinking Water Act

National Drinking Water Advisory Council

Water Infrastructure Security

A to Z Topics

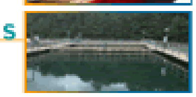
The Office of Ground Water and Drinking Water (OGWDW), together with states, tribes, and its many partners, protects public health by ensuring safe drinking water and protecting ground water. OGWDW, along with EPA's ten regional drinking water programs, oversees implementation of the Safe Drinking Water Act, which is the national law safeguarding tap water in America.

Local Drinking Water Quality

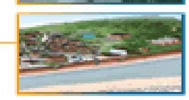
Source Water Protection

Drinking Water Standards

Public Drinking Water Systems



Underground Injection Control



In the news . . .

Lead In Drinking Water

Lead, a metal found in natural deposits, is commonly used in household plumbing materials and water service lines. The greatest exposure to lead is swallowing or breathing in lead paint chips and dust. But lead in drinking water can also cause a variety of adverse health effects. In babies and children, exposure to lead in drinking water above the action level can result in delays in physical and mental development, along with slight deficits in attention span and learning abilities. In adults, it can cause increases in blood pressure. Adults who drink this water over many years could develop kidney problems or high blood pressure.

HOT LINKS:

- Lead in the District of Columbia's Drinking Water
- Lead In Drinking Water

Water*Spots*

What's New
Posters and Videos
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Arsenic
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What You Can Do

Window To My Environment
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The Office of Ground Water and Drinking Water now has a new page dedicated to our new posters and videos. The latest products on this page, include the Source Water Protection - It s In Our Hands poster and brochure, as well as the new 2003 National DrinkingWater Regulations poster and pocket guide. Along with these new products, you will find other great outreach posters and videos, with all the ordering information you need. Check it out here.

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Drinking Water and Health: What you need to know

- Printable version of this document [PDF]
- En Español

EPA 816-K-99-001
October 1999

The United States has one of the safest water supplies in the world. However, national statistics don't tell you specifically about the quality and safety of the water coming out of your tap. That's because drinking water quality varies from place to place, depending on the condition of the source water from which it is drawn and the treatment it receives.

Now you have a new way to find information about your drinking water, if it comes from a public water supplier. (EPA doesn't regulate private wells, but does have recommendations for their owners.) Every community water supplier must provide an annual report (sometimes called a consumer confidence report) to its customers. The report provides information on your local drinking water quality, including the water's source, the contaminants found in the water, and how consumers can get involved in protecting drinking water. If you have been looking for specific information about your drinking water, this annual report will provide you with the information you need to begin your investigation.

These annual reports will by necessity be short documents. You may want more information, or have more questions. One place you can go is to your water supplier, who is best equipped to answer questions about your specific water supply. This page will help you find other sources of information.

For an overview of drinking water issues, read Water on Tap: A Consumer's Guide to the Nation's Drinking Water. You may wish to consult EPA's drinking water glossary if you find unfamiliar terms in the following pages. For other assistance, please contact the Safe Drinking Water Hotline at 1-800-426-4791.

You will need Adobe Acrobat Reader to view the Adobe PDF files on this page. See EPA's PDF page for more information about getting and using the free Acrobat Reader.

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U.S. Environmental Protection Agency

Ground Water & Drinking Water

Frequently Asked Questions

Getting Information about Tap Water
Is it safe? How do I find information about water quality? How can I test it?

Drinking Water Standards and Contaminants (including taste and odor concerns)
What are drinking water standards? How do I find information about specific contaminants or the taste/odor of my tap water?

Special Health Needs of People With Severely Compromised Immune Systems
What if I have a compromised immune system?

Private Wells, Bottled Water, Home Water Treatment

Drinking Water Sources and Protection
Where does my drinking water come from? How can I help protect it?

Facts and More Information How many public water systems are there in the U.S.? Where can I get more information?

Q: **How can I find out if my tap water is safe to drink?**
A: Because of water's different sources and the different ways in which water is treated, the taste and quality of drinking water varies from place to place. Over 90 percent of water systems meet EPA's standards for tap water quality. The best source of specific information about your drinking water is your water supplier. Water suppliers that serve the same people year-round are required to send their customers an annual water quality report (sometimes called a consumer confidence report). Contact your water supplier to get a copy or see if your report is posted on-line. For additional

information, visit EPA's web site's on local drinking water (provides links to state and local sources of water quality information) and drinking water and health (provides information on drinking water contaminants and their health effects).

Q. **How will I know if my water isn't safe to drink?**
A: Your water supplier must notify you by newspaper, mail, radio, TV, or hand-delivery if your water doesn't meet EPA or state standards or if there is a waterborne disease emergency. The notice will describe any precautions you need to take, such as boiling your water. Follow the advice of your water supplier if you ever receive such a notice. The most common drinking water emergency is contamination by disease-causing germs. Boiling your water for one minute will kill these germs. You can also use common household bleach or iodine to disinfect your drinking water at home in an emergency, such as a flood (see EPA's emergency disinfection fact sheet for specific directions on how to disinfect your drinking water in an emergency).

Q. **What's this new drinking water report that I've heard about?**
A. Water suppliers must deliver to their customers annual drinking water quality reports (or consumer confidence reports). These reports will tell consumers what contaminants have been detected in their drinking water, how these detection levels compare to drinking water standards, and where their water comes from. The reports must be provided annually before July 1, and, in most cases, are mailed directly to customers' homes. Contact your water supplier to get a copy of your report, or see if your report is posted on-line.

Q. **How can I get my water tested?**
A: If your home is served by a water system, get a copy of your annual water quality report before you test your water. This report will tell you what contaminants have been found in your drinking water and at what level. After you've read this report, you may wish to test for specific contaminants (such as lead) that can vary from house to house, or any other contaminant you're concerned about. EPA does not test individual homes, and cannot recommend specific laboratories to test your drinking water. States certify water testing laboratories. You may call your state certification officer to get a list of certified laboratories in your state. Depending on how many contaminants you test for, a water test can cost from $15 to hundreds of dollars.

Q. **What is a drinking water standard?**
A. Under the authority of the Safe Drinking Water Act (SDWA),

EPA sets standards for approximately 90 contaminants in drinking water. For each of these contaminants, EPA sets a legal limit, called a maximum contaminant level, or requires a certain treatment. Water suppliers may not provide water that doesn't meet these standards. Water that meets these standards is safe to drink, although people with severely compromised immune systems and children may have special needs. For a more detailed description, read about how standards are set or about EPA's Office of Ground Water and Drinking Water.

Q. **I don't like the taste/smell/appearance of my tap water. What's wrong with it?**
A. Even when water meets EPA's standards, you may still object to its taste, smell, or appearance. EPA sets secondary standards based on these aesthetic characteristics (not health effects) which water systems and states can choose to adopt. Common complaints about water aesthetics include temporary cloudiness (typically caused by air bubbles) or chlorine taste (which can be improved by letting the water stand exposed to the air).

Q. **I'm worried about a specific drinking water contaminant [lead, Cryptosporidium, nitrate, radon, etc.]. What should I know?**
Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. As long as they occur below EPA's standards, they don't pose a significant threat to health, although people with severely compromised immune systems and children may have special needs. For more information about a specific contaminant, see EPA's fact sheets on drinking water contaminants, which have more detailed information on every contaminant EPA currently sets standards for and those EPA is considering setting standards for.

Q. **What if I have a severely compromised immune system?**
A. Some people may be more vulnerable to contaminants in drinking water than the general population. People with severely compromised immune systems, such as people with cancer undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control guidelines on appropriate means to lesson the risk of infection from Cryptosporidium and other microbial contaminants offer more detailed advice.

Q. **What should I do if I have my own drinking water well?**
A: If you have your own well, you are responsible for making sure that your water is safe to drink. Private wells should be tested annually for nitrate and coliform bacteria to detect contamination problems early. Test more frequently and for other contaminants, such as radon or pesticides, if you suspect a problem. Check with your local health department and local public water systems that use ground water to learn more about well water quality in your area and what contaminants you are more likely to find. More information is available on EPA's page for private well owners .
You can help protect your water supply by carefully managing activities near the water source. The organization Farm*A*Syst/Home*A*Syst EXIT disclaimer provides information to help farmers and rural residents assess pollution risks and develop management plans to meet their unique needs.

Q. **What about bottled water?**
A: Bottled water is not necessarily safer than your tap water. EPA sets standards for tap water provided by public water systems; the Food and Drug Administration sets bottled water standards based on EPA's tap water standards. Bottled water and tap water are both safe to drink if they meet these standards, although people with severely compromised immune systems and children may have special needs. Some bottled water is treated more than tap water, while some is treated less or not treated at all. Bottled water costs much more than tap water on a per gallon basis. Bottled water is valuable in emergency situations (such as floods and earthquakes), and high quality bottled water may be a desirable option for people with weakened immune systems. Consumers who choose to purchase bottled water should carefully read its label to understand what they are buying, whether it is a better taste, or a certain method of treatment.

More information on bottled water is available from the EXIT EPA International Bottled Water Association, EXIT disclaimer which represents most US bottlers.

Q. **What about home water treatment units?**
A: Most people do not need to treat their drinking water at home to make it safe. A home water treatment unit can improve water's taste, or provide an extra margin of safety for people more vulnerable to the effects of waterborne illness (people with severely compromised immune systems and children may have special needs). Consumers who choose to purchase a home water treatment unit should carefully read its product information to understand

what they are buying, whether it is a better taste or a certain method of treatment. Be certain to follow the manufacturer's instructions for operation and maintenance, especially changing the filter on a regular basis. EPA neither endorses nor recommends specific home water treatment units. EPA does register units that make germ-killing claims (contact the National Antimicrobial Information Network at 800/447-6349 for more information). No single unit takes out every kind of drinking water contaminant; you must decide which type best meets your needs.

For help in picking a unit, contact one of the following independent non-profit organizations:
NSF International EXIT disclaimer (877/8-NSF-HELP), the Underwriters Laboratories Inc. EXIT disclaimer (888-547-8851), and the Water Quality Association EXIT disclaimer (630-505-0160).
Both NSF International and Underwriters Laboratories Inc. test and certify home water treatment units. The Water Quality Association classifies units according to the contaminants they remove as well as listing units that have earned their Gold Seal approval. Water treatment units certified by these organizations will indicate certification on their packaging or labels.

Q. **Where does my drinking water come from?**
A. Drinking water can come from either ground water sources (via wells) or surface water sources (such as rivers, lakes, and streams). Nationally, most water systems use a ground water source (80%), but most people (66%) are served by a water system that uses surface water. This is because large metropolitan areas tend to rely on surface water, whereas small and rural areas tend to rely on ground water. In addition, 10-20% of people have their own private well for drinking water. To find the source of your drinking water, check your annual water quality report or call your water supplier. You can get more information about specific watersheds by visiting EPA's Watershed Information Network. You can also learn more about EPA, state, and other efforts to protect sources of drinking water.

Q. **How can I help protect my drinking water?**
A: Drinking water protection is a community-wide effort, beginning with protecting the source of your water, and including education, funding, and conservation. Many communities already have established source water protection programs. Call your local water supplier to find out if your community participates. You can also support efforts to improve operation, maintenance, and construction of water treatment processes. States are now engaged in source water assessments, to work with communities to identify local sources of contamination. You can contact your state source water

protection program to find out how to get involved in this process, or join a local group in Adopting a Watershed.

Q. **How many public water systems are there in the United States?**
A. There are almost 170,000 public water systems in the United States. Visit EPA's page of water system facts and figures for more information.

Q: **Where can I get more information?**
A: For more information on your drinking water, contact your water supplier.

You can also contact:

- your state drinking water program;
- call EPA's Safe Drinking Water Hotline at 1-800-426-4791;
- explore the rest of the Office of Ground Water and Drinking Water's web site, or
- order publications from EPA on various topics from source water protection to home well use.

EPA has also prepared a citizen's guide to drinking water called Water on Tap: What You Need To Know.

U.S. Environmental Protection Agency

Local Drinking Water Information

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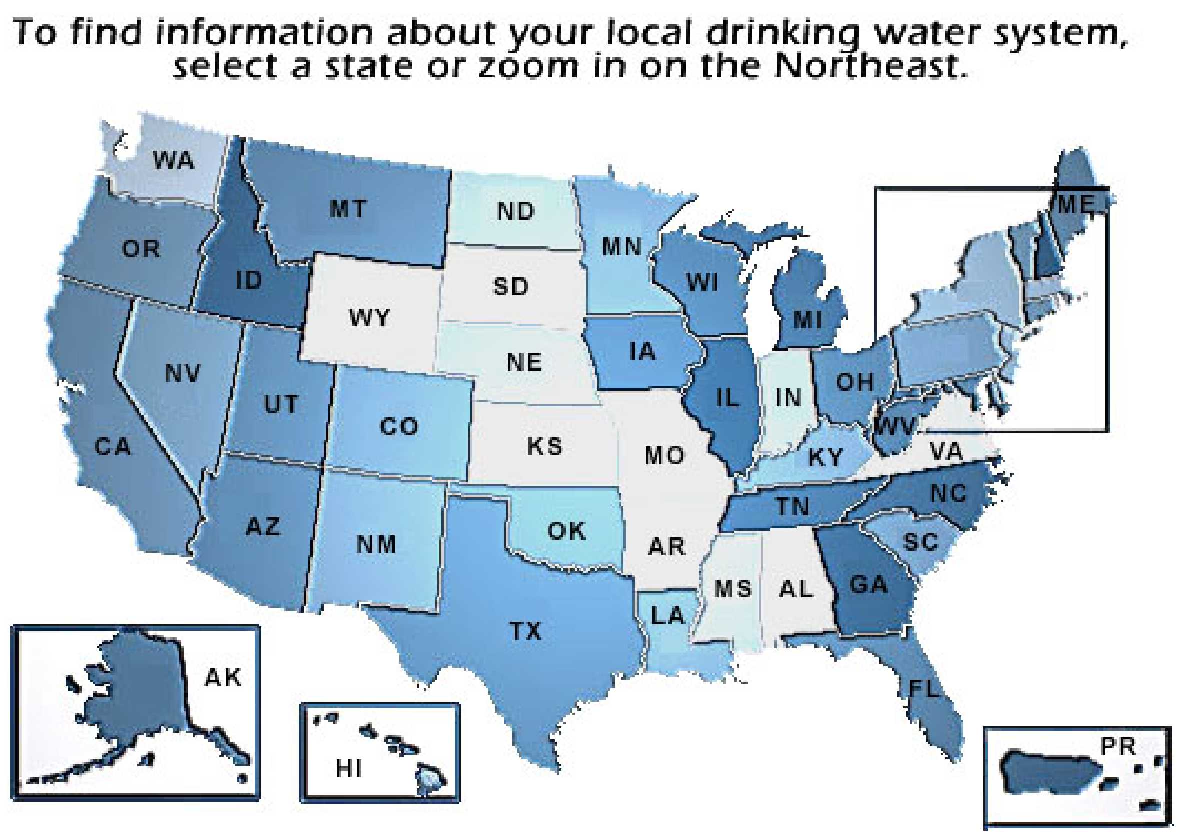
Drinking Water For Kids!

Local Drinking Water Information

[Customer Satisfaction](#)

Each year by July 1 you should receive in the mail a short report (consumer confidence report) from your water supplier that tells where your water comes from and what's in it -- [see if your report is posted on-line](#) or [read a fact sheet](#) about these new reports.



- [Guam](#)
- [American Samoa](#)
- [Virgin Islands](#)
- [Northern Mariana Islands](#)

Follow the links below to the state and local members of our safe drinking water partner organizations:

[American Water Works Association](#) EXIT disclaimer

[Association of Metropolitan Water Agencies](#) EXIT disclaimer

Association of State Drinking Water Administrators EXIT disclaimer

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Drinking Water and Health Basics

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Drinking Water Standards

Priority Rulemakings

- Arsenic
  The Safe Drinking Water Act requires EPA to revise the existing 50 parts per billion (ppb) standard for arsenic in drinking water. EPA is implementing a 10 ppb standard for arsenic.
- Ground Water Rule
  EPA is proposing a rule which specified the appropriate use of disinfection in ground water and addresses other components of ground water systems to assure public health protection.
- Lead and Copper
  EPA estimates that approximately 20 percent of human exposure to lead is attributable to lead in drinking water.
- Microbials & Disinfection Byproducts
  A major challenge for water suppliers is how to balance the risks from microbial pathogens and disinfection byproducts. This paragraph includes development of the Long Term 2 Enhanced Surface Water Treatment Rule and Stage 2 Disinfectants and Disinfection Byproducts Rule.
- MTBE
  MTBE (methyl-t-butyl ether) is a member of a group of chemicals commonly known as fuel oxygenates.

QUICK LINKS

Priority Rulemakings

Regulatory Infrastructure

Additional Information

Adobe Acrobat Reader is required to view PDF documents. The most recent version of the Adobe Acrobat Reader EXIT disclaimer is available as a free download. An Adobe Acrobat plug-in for assisted technologies is also available.

MTBE replaces the use of lead as an octane enhancer since 1979.

- Radionuclides
  EPA has updated its standards for radionuclides in drinking water.
- Radon
  Radon is a naturally-occurring radioactive gas that may cause cancer, and may be found in drinking water and indoor air.
- Unregulated Contaminant Monitoring Rule
  EPA uses data generated by the UCMR to evaluate and prioritize contaminants on the Drinking Water Contaminant Candidate List, a list of contaminants EPA is considering for possible new drinking water standards.

Regulatory Infrastructure

- Analytical Methods for Drinking Water
  An analytical method is a procedure used to analyze a sample in order to determine the identity and concentration of a specific sample component. Many government agencies, universities and consensus methods organizations develop analytical methods.
- Laboratory Certification
  Laboratories analyzing drinking water compliance samples must be certified by U.S. EPA or the State. They must analyze performance evaluation samples, use approved methods and States also require periodic on-site audits.
- National Contaminant Occurrence Database
  The NCOD was developed to satisfy statutory requirements set by Congress in the 1996 Safe Drinking Water Act amendments. The purpose of the database is to support EPA's decisions related to identifying contaminants for regulation and subsequent regulation development.
- Occurrence and Contaminant Selection
  EPA is required to establish a list of contaminants to aid in priority-setting for the Agency's drinking water program. EPA has divided contaminants among those which are priorities for additional research, those which need additional occurrence data, and those which are priorities for consideration in rulemaking.
- Six Year Review of Standards
  EPA is required to review each national primary

drinking water regulation promulgated by the Agency at least every six years.

- Treatment Technology
  The mission of the treatment technology team is to identify and/or develop high quality, cost-effective treatment technologies to meet regulation development and program implementation objectives and deadlines.

Additional Information

- Research
  Links to the National Center for Environmental Assessment (NCEA) home page.
- Current Standards (MCLs)
  EPA sets standards that, when combined with protecting ground water and surface water, are critical to ensuring safe drinking water. EPA works with its regional offices, states, tribes and its many partners to protect public health through implementing the Safe Drinking Water Act.
- Drinking Water and Health
  The U.S. has one of the safest water supplies in the world. Now you have a way to find information about your drinking water if it comes from a public water supplier.
- Meeting Summaries
  Read summaries of public meetings related to Safe Drinking Water Act implementation.
- Partnership for Safe Water
  The Partnership for Safe Water is a unique cooperative effort between EPA and its stakeholders. The Partnership encourages and assists U.S. water suppliers to voluntarily enhance their water systems' performance.
- Perchlorate
  EPA has released for public review and comment its revised draft toxicity assessment on perchlorate, which is the primary ingredient of solid rocket propellant.
- Sulfate
  Sulfate is a substance that occurs naturally in drinking water. Health concerns regarding sulfate in drinking water have been raised because of reports that diarrhea may be associated with the ingestion of water containing high levels of sulfate.

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Regulations & Guidance

[List of National Primary Drinking Water Standards (MCLs)](#)
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[help with PDF files](#)

Current drinking water rules (by date issued)

Chart of [key regulatory dates](#) (2000-2006) PDF file

- NEW [National Primary Drinking Water Regulations: Analytical Method for Uranium](#)
- NEW [Withdrawal of Direct Final Rule; National Primary Drinking Water Regulations: Analytical Method for Uranium](#)
- [National Primary Drinking Water Regulations: Minor Corrections and Clarification to Drinking Water Regulations; National Primary Drinking Water Regulations for Lead and Copper](#) (June 29, 2004)
- National Primary and Secondary Drinking Water Regulations: Approval of Additional Method for the Detection of Coliforms and E. coli in Drinking Water; Final Rule (February 13, 2004) ([HTML](#)) ([PDF](#))
- Unregulated Contaminant Monitoring Regulation: Approval of Analytical Method for Aeromonas; National Primary and Secondary Drinking Water Regulations: Approval of Analytical Methods for Chemical and Microbiological Contaminants; Final Rule (October 29, 2002) ([read online](#)) ([PDF](#))
- Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; National Primary Drinking Water Regulations; and National Secondary Drinking Water Regulations; Methods Update; Final Rule (October 23, 2002) ([read online](#)) ([PDF](#)) ([Fact

Sheet)

- Unregulated Contaminant Monitoring Regulation for Public Water Systems; Establishment of Reporting Date: Direct Final Rule (March 12, 2002) (read online) ~ (PDF)
- Long Term 1 Enhanced Surface Water Treatment Rule (January 14, 2002) (read online) ~ (PDF)
- Unregulated Contaminant Monitoring Amendment to List 2 Rule and Delay of Reporting Monitoring Results (September 4, 2001) - Direct Final Rule
- Filter Backwash Recycling Rule (June 8, 2001) (read online) ~ (PDF)
- Arsenic Rule (Jan 22, 2001) (read online) ~ (PDF)
- Unregulated Contaminant Monitoring List 2 Rule (Jan. 11, 2001)
(HTML) ~ (PDF)
- Radionuclides Rule (Dec 7, 2000) (HTML) ~ (PDF)
- Drinking Water State Revolving Fund Rule (Aug 7, 2000) (HTML) ~ (PDF)
- Removal of the MCLG for Chloroform (May 30, 2000) (HTML)
- Public Notification Rule (May 4, 2000) (HTML) ~ (PDF)
- Analytical Methods for Perchlorate and Acetochlor (Mar 2, 2000)
(HTML) ~ (PDF)
- Lead and Copper Rule minor revisions (Dec 20, 1999) (HTML)
- Underground Injection Control Regulations for Class V Injection Wells (Dec 7, 1999) (HTML) ~ (PDF)
- Analytical Methods for Chemical and Microbiological Contaminants and Revisions to Laboratory Certification Requirements (Dec 1, 1999) (HTML)
- Revisions to the Unregulated Contaminant Monitoring Rule. (Sep 17, 1999) (HTML) ~ (PDF)
- Suspension of Unregulated Contaminant Monitoring Requirements for small public water systems (Jan 8, 1999) (HTML)
- Interim Enhanced Surface Water Treatment Rule (Dec 16, 1998) (HTML) ~ (PDF)
- Stage 1 Disinfectants and Disinfection Byproducts Rule (Dec 16, 1998) (HTML) ~ (PDF)

- Consumer Confidence Report Rule (Aug 19, 1998) (HTML) ~ (PDF)
- Variances and Exemptions Rule (Aug 14, 1998) (HTML) ~ (PDF)
- Drinking Water Contaminant Candidate List (March 2, 1998) (HTML) ~ (PDF)
- Revisions to State Primacy Requirements (April 28, 1998) (HTML)
- Small System Compliance Technology List for the Surface Water Treatment Rule (Aug 6, 1997) (PDF)
- Withdrawal of 1991 proposed rule on Radon-222 (Aug 6, 1997) (HTML)
- Analytical Methods for Radionuclides (Mar 5, 1997) (HTML)
- Information Collection Rule (May 14, 1996) (HTML) ~ (PDF)

Proposed rules and other notices open for public comment

Newly proposed rules are listed on the Open for Comment page

Proposed Rules and Notices for which the comment period has closed (date closed)

- National Primary Drinking Water Regulations: Analytical Method for Uranium - Proposed Rule
- Disinfectants/Disinfection By-Products, Chemical, and Radionuclides Rules Information Collection Rule (Renewal)
- Microbial Rules Information Collection Rule (Renewal)
- Public Water System Supervision Program Information Collection Rule (Renewal)
- The Final Draft of the Tribal Drinking Water Operator Certification Program Guidelines is available and EPA is requesting comments
- Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; National Primary Drinking Water Regulations; and National Secondary Drinking Water Regulations; Analysis and Sampling Procedures - Proposed Rule
  - Federal Register Notice
  - More Information
- Drinking Water Contaminant Candidate List 2 (June 1, 2004)

- National Primary Drinking Water Regulations: Minor Corrections and Clarification to Drinking Water Regulations (May 3, 2004)
- National Primary Drinking Water Regulations: Long Term 2 Enhanced Surface Water Treatment Rule - Proposed Rule (May 15, 2004)
- Stage 2 Disinfectants and Disinfection Byproducts Proposed Rule (May 15, 2004)
- Proposed Aeromonas and NPDWR Methods Rule (May 6, 2002)
- Proposed ground water rule (August 9, 2000)
- Proposed radon rule (November 2, 1999)
- Sulfate health effects study (May 12, 1999)

Code of Federal Regulations (PDF files) -- The CFR compiles all rules currently in effect, and is updated annually as of July 1. To view or search these parts in a section-by-section format, or for other federal regulations, visit the Government Printing Office EXIT EPA site. You can also try GPO's new E-CFR EXIT EPA, which is updated weekly.

- National Primary Drinking Water Regulations 40 CFR part 141
- National Primary Drinking Water Regulations Implementation 40 CFR part 142
- National Secondary Drinking Water Regulations 40 CFR part 143
- Underground Injection Control Program 40 CFR part 144
- State UIC Program Requirements 40 CFR part 145
- Underground Injection Control Program Criteria & Standards 40 CFR part 146
- State Underground Injection Control Programs 40 CFR part 147
- Hazardous Waste Injection Restrictions 40 CFR part 148
- Sole Source Aquifiers 40 CFR part 149

Guidance and Policy documents

EPA has created a new web site for guidance documents. Presently, the site contains only documents issued since January 1999.

- Water Supply Guidance

- Quick Reference Guides
  - NEW Standardized Monitoring Framework (EPA 816-F-04-010 March 2004)
  - NEW Lead and Copper Rule: A Quick Reference Guide (EPA 816-F-04-009 March 2004) (125 K PDF FILE)
- Guidance on new rules:
  - Arsenic Rule
  - Consumer Confidence Report Rule
  - Lead and Copper Rule
  - Microbial and Disinfection Byproducts Rules
  - Public Notification Rule
  - Radionuclides Rules
  - Unregulated Contaminant Monitoring Rule
- Guidance for Small Systems
- Alternative Monitoring Guidelines
- Guidance on the Drinking Water State Revolving Fund Program
- Guidance on Analytical Methods for Drinking Water (1998)
- Manual for the Certification of Laboratories Analyzing Drinking Water
- Guidance on Data/Databases
- Guidance on State Source Water Assessment and Protection Programs (1997)
- Guidance for Future State Ground Water Protection Grants (1997)

You will need Adobe Acrobat Reader to view the Adobe PDF files on this page. See EPA's PDF page for more information about getting and using the free Acrobat Reader.

U.S. Environmental Protection Agency

Public Drinking Water Systems Programs

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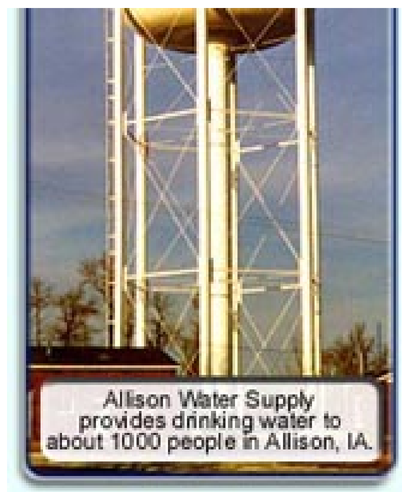
- Infrastructure Security
- PWS Info
- DWSRF
- Training
- Rule Implementation
- Operator Certification
- Small Systems
- Labs & Monitoring
- Conservation
- Research
- PWSS Issues
- Enforcement
- Variances & Exemptions
- Other Agencies

The public drinking water systems regulated by EPA, and delegated states and tribes, provide drinking water to 90 percent of Americans. These public drinking water systems, which may be publicly- or privately-owned, serve at least 25 people or 15 service connections for at least 60 days per year. Through the Public Water System Supervision (PWSS) program, EPA implements and enforces drinking water standards to protect public health.

Below we have listed some of the activities that EPA, states, and tribes undertake to regulate public water supplies. EPA does not regulate drinking water wells that supply water to fewer than 25 people. To learn about drinking water from private wells, click here.



Allison Water Supply provides drinking water to about 1000 people in Allison, IA.

Water Infrastructure Security: Grants are available to improve the security of the water supply in large public water systems. For information on how to apply, go to the Water Infrastructure Security Page.

Information about Public Drinking Water Systems: for information about a particular drinking water system in your state, go to the Local Drinking Water Page.

- Water System Facts and Figures (PDF File)
- Drinking Water Needs Survey, January 2001
- Community Water Systems Survey, December 2002
- National PWS Annual Compliance Reports
- Review of Contaminant Occurrence in PWSs, November 1999

Drinking Water State Revolving Fund: EPA awards grants to states to establish revolving loan funds to assist public water systems wtih infrastructure improvements. The program also allows states to reserve a portion of their grant to fund activities needed for source water protection and enhanced water systems management.

Drinking Water Academy: EPA offers classroom and Web-based training to improve implementation of the Safe Drinking Water Act.

Rule Implementation: After working with states and water suppliers to develop new drinking water rules, EPA provides guidance documents to help them implement the rules.

- Implementation milestones for new rules (2000-2006) (PDF file) (UPDATED April

24, 2003)

- Arsenic Rule
- Consumer Confidence Report Rule
- Lead and Copper Rule
- Microbial and Disinfection Byproducts Rules
- Public Notification Rule
- Radionuclides Rules

Operator Certification: States must implement programs to certify operators of drinking water systems. EPA has published guidance outlining minimum requirements.

Small Systems and Capacity Development: The program addresses issues affecting drinking water systems serving populations less than 3,300. A major focus is on capacity development, which refers to the technical, financial and managerial capacity of a system to provide safe drinking water. The program also provides information about treatment technology options for small systems.

Laboratories and Monitoring: Water systems must monitor their drinking water to ensure that it is safe for their customers. Monitoring schedules differ according to the type of contaminant and the population that the public water system serves. EPA approves the analytical methods that laboratories use to analyze drinking water samples and also certifies the laboratories.

- NEW Standardized Monitoring Framework (EPA 816-F-04-010 March 2004)

Water Conservation: See our water efficiency page for information on guidelines for states on water conservation programs and guidance for water systems on how to prepare water conservation plans, as well as fact sheets for the public.

Research: The Office of Research & Development's Water Supply and Water Resources Division conducts research to help prepare drinking water regulations and to develop technologies and strategies for controlling waterborne contaminants.

Public Water System Supervision (PWSS) Program Issues

- PWSS Water Supply Guidance
- Definition of a Public Water System (PWS)
- Primacy Requirements: states must meet specific requirements in order to have enforcement responsibility for PWSs
- PWSS Grants to States
- **Drinking Water Customer Satisfaction Survey** (240 K PDF FILE)
  EPA commissioned the Gallup Organization to conduct a nationwide telephone survey of 1,000 households to assess (1) general knowledge about drinking water, (2) water use behavior, such as use of bottled water and home water treatment systems, (3) public confidence with information sources, and (4) value consumers place on EPA's "right-to-know" efforts, such as consumer confidence reports and source water assessments.

Enforcement: EPA's Office of Enforcement and Compliance Assurance (OECA) works on enforcement activities related to drinking water.

Variances and Exemptions: States or EPA may grant variances to allow public water systems to use less costly technology. Exemptions can allow public water systems more time to comply with a new regulation. Read the rule, published in August 1998.

Information from other federal agencies: EXIT EPA

- Department of Agriculture Rural Utilities Service

- Department of Interior Bureau of Reclamation
- US Geological Survey

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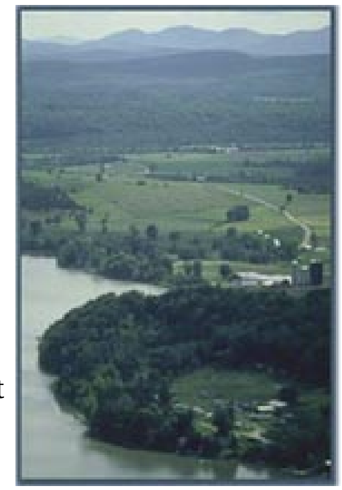
U.S. Environmental Protection Agency

Source Water Protection

Source Water Protection



Source water is untreated water from streams, rivers, lakes, or underground aquifers which is used to supply private wells and public drinking water.

Preventing drinking water contamination at the source makes sense:

- good public health sense;
- good economic sense; and
- good environmental sense.

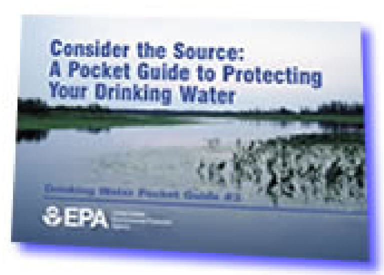
Preventing contamination of drinking water supplies is an important mission within EPA's Office of Ground Water and Drinking Water.

This site has basic information about the water used for drinking water and the federal, state, and local programs that assess and manage potential public health risks, including a Web Guide - an annotated guide to EPA source water resources. Please see our Site Map for a complete list of topics. Source Water Features, found at the bottom of this page, highlights recent additions to the site.

We are currently revising and updating this site and your input will be helpful. Please send comments and suggestions to hall.beth@epa.gov. Thank you!

It's in our hands Source Water Protection News

Featured Items



Consider the Source Pocket Guide

Web Guide

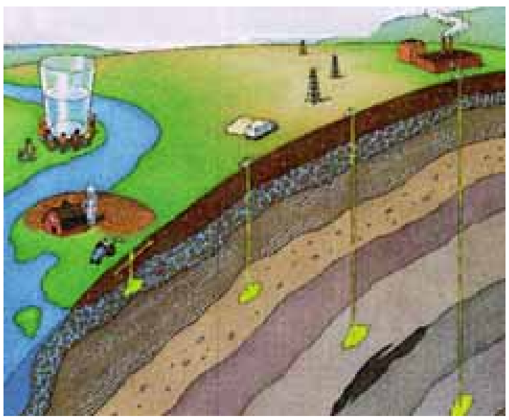
U.S. Environmental Protection Agency

Underground Injection Control Program

Underground Injection Control (UIC) Program

Federal UIC Directory (Find the Fed to help you!)

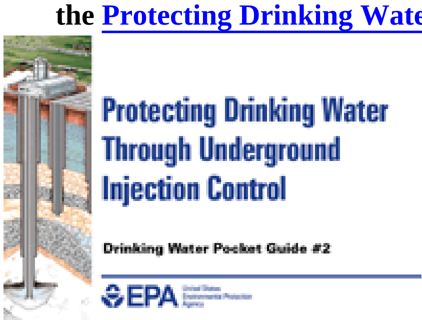
See the UIC Documents link below for 96 new digital documents



The UIC Program works with state and local governments to oversee underground injection of waste in order to prevent contamination of drinking water resources. Some of the wastes the UIC program regulates include:

- Over 9 billion gallons of hazardous waste every year
- Over 2 billion gallons of brine from oil and gas operations every day
- Automotive, industrial, sanitary and other wastes that are injected into shallow aquifers.

For an overview of the UIC Program check out the Protecting Drinking Water Through Underground Injection Control: Drinking Water Pocket Guide #2



Regional UIC web pages

What is the UIC Program?

Initiatives

- **Hydraulic Fracturing Memorandum of Agreement** (9 pgs., 332KB PDF)
- **Study of the Risks Associated with Class I Underground Injection Wells** (EPA 816-R-01-007 / March 2001)
- **Class V Wells Initiative**
  Information about protecting sources of drinking water by complying with new EPA rules on shallow wells used to inject a wide variety of wastes.
- **Study on Hydraulic Fracturing of Coalbed Methane Wells**

NEW **UIC Grant Guidance**

- FY 2004 UIC Tribal Grant Allotment
- 2004 Memorandum (48K PDF FILE) (All About PDF Files)
- 1984 (3.6MB PDF FILE) (All About PDF Files)
- 1986 (1.5MB PDF FILE) (All About PDF Files)

State UIC Programs

Source Water Protection Tribal Page

Regulations and Guidance

UIC Technical Work Group

UIC Reporting Forms (7520s)

Region 3 ~ Region 4 ~ Region 5
Region 6 ~ Region 10

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Drinking Water Data & Databases

EPA maintains drinking water data in several databases. It uses this information to help manage environmental programs, and provides public access to the data through the Internet. Other water-related databases are maintained in other parts of EPA.

Safe Drinking Water Information System - Federal version (SDWIS/FED): SDWIS/FED is EPA's national regulatory compliance database for the drinking water program. It includes information on the nation's 170,000 public water systems and violations of drinking water regulations.

- Access Drinking Water Information Online (through summary pivot tables, Envirofacts, or direct connection to the mainframe)
- SDWIS/FED Website (information for users who work with the database)
- SDWIS/FED Modernization NEW

Unregulated Contaminant Monitoring Rule (UCMR): EPA uses data generated by the UCMR to evaluate and prioritize contaminants on the Drinking Water Contaminant Candidate List, a list of contaminants EPA is considering for possible new drinking water standards.

- Access UCMR data (by downloading MS Excel PivotTables®)
- About UCMR

National Contaminant Occurrence Database (NCOD) was developed to satisfy the statutory requirements set by Congress in the 1996 Safe Drinking Water Act (SDWA) amendments. The purpose of the database is to support the U.S. Environmental Protection Agency's (EPA) decisions related to identifying contaminants for regulation and subsequent regulation development. The NCOD contains occurrence data from both Public Water Systems (PWSs) and other sources (like the U.S. Geological Survey National Water Information System) on physical, chemical, microbial and radiological contaminants for both detections and non-detects.

Information Collection Rule (ICR) Federal Database: The ICR database includes research data from an 18-month study of disinfection byproducts and microbial contaminants.

- Access ICR Drinking Water Microbial And Disinfection Byproduct Information
- About ICR Data And Development

Safe Drinking Water Information System - State Version(SDWIS/State): SDWIS/State is a data system that EPA is developing for states that will improve the quality of drinking water information.

- SDWIS/STATE Website

Watershed Information Network: WIN helps people learn about the watershed in which they live.

- Access Watershed Information Network

Index of Watershed Indicators (IWI): IWI is a compilation of information on the "health" of aquatic resources including all watersheds in the lower 48 states.

- Access IWI

Reports: Periodically, EPA analyzes and reports on occurrence of certain contaminants in sources of drinking water

- A Review of Contaminant Occurrence in Public Water Systems, EPA 816-R-99-006, November 1999

If you can't find the information you need through the sources above, you may also consider filing a Freedom of Information Act (FOIA) request for drinking water data.

You will need Adobe Acrobat Reader to view the Adobe PDF files on this page. See EPA's PDF page for more information about getting and using the free Acrobat Reader.

U.S. Environmental Protection Agency

Drinking Water Academy

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DWA Home

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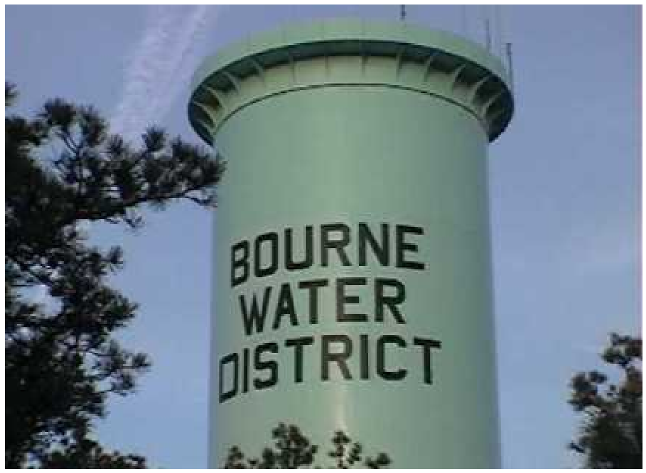

Established by the U.S. EPA Office of Ground Water and Drinking Water, the Drinking Water Academy (DWA) is a long-term training initiative whose primary goal is to expand EPA, State, and Tribal capabilities to implement the 1996 Amendments to the Safe Drinking Water Act (SDWA). In addition to providing classroom and Web-based training, the DWA will act as a resource for training materials pertaining to SDWA implementation. EPA formed the DWA to help EPA, States, and Indian Tribes enhance program capability to meet the public health protection objectives of the SDWA requirements. The 1996 SDWA Amendments created a number of new programmatic challenges for the States, Tribes, and the water systems they regulate. The Amendments also provided new funding opportunities to meet these growing needs. DWA training will support EPA, State, and Tribal efforts to implement these new regulations.

DRINKING WATER ACADEMY DWA

DWA en español

Hot Topics

Electronic Sanitary Survey

New courses available for download through the Electronic Workshop:

- Introducción al Programa de Supervisión del Sistema Público de Agua Potable
- UIC Pressure Fall-off Testing
- The Nuts and Bolts of Fall-off Testing
- Pressure Fall-off

Testing Guideline

Training Spotlight

EPA's Office of Ground Water and Drinking Water will be conducting Web cast training sessions for the Radionuclides and Arsenic Rules. The third of four will be held on Wednesday, September 15, 2004. For more information on this and all upcoming Web casts, click here.

DWA has developed an electronic version of a sanitary survey for use by state sanitary inspectors equipped with a personal digital assistant (PDA). For more information, see the Electronic Sanitary Survey page.

Quick Jump to DWA Sections:

[Select a Section]

Drinking Water and Health Basics

Frequently Asked Questions

Local Drinking Water Information

Drinking Water Standards

List of Contaminants & MCLs

Regulations & Guidance

Public Drinking Water Systems

Source Water Protection

Underground Injection Control

Data & Databases

Drinking Water Academy

Safe Drinking Water Act

National Drinking Water Advisory Council

Water Infrastructure Security

Drinking Water For Kids!

The Safe Drinking Water Act

The Act | 1996 Amendments | SDWA's 25th Anniversary | SDWA Requirements

The Safe Drinking Water Act (SDWA), which celebrates its 30th anniversary in 2004, celebrated its 25th anniversary in 1999, is the main federal law that ensures the quality of Americans' drinking water.

Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.

To learn more about the Safe Drinking Water Act:

- read our short summary of the Act (229 K PDF FILE,4 pgs) (ALL ABOUT PDF FILES)
- search SDWA online EXIT disclaimer or
- download a 6.7 M text file EXIT disclaimer (Note: SDWA is included in 'Chapter 6A - Public Health Service' / section 300f)

In 1996, Congress amended the Safe Drinking Water Act to emphasize sound science and risk-based standard setting, small water supply system flexibility and technical assistance, community-empowered source water assessment and protection, public right-to-know, and water system infrastructure assistance through a multi-billion-dollar state revolving loan fund. For more detailed information, read:

- Section-by-section summary,
- Thematic summary, or
- Full text of the 1996 SDWA Amendments.

- *The Safe Drinking Water Act - One Year Later - Success in Advancing Public Health Protection* (EPA 810-F-97-002, September 1997)

Historical Press Releases

- EPA Voices Support for Safe Drinking Water Act [March 8, 1973]
- Train Names 80 Cities for EPA Drinking Water Survey [December 18, 1974]
- EPA Safe Drinking Water Standards Go into Effect Today [June 25, 1977]
- President Signs Safe Drinking Water Act Amendments [June 20, 1986]
- Lead Contamination Control and Asbestos Information Acts of 1988 [November 1, 1988]
- President Clinton Signs Legislation to Ensure Americans Safe Drinking Water [August 6, 1996]

Drinking Water and Health Basics

Frequently Asked Questions

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Drinking Water Standards

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Regulations & Guidance

Public Drinking Water Systems

Source Water Protection

Underground Injection Control

Data & Databases

Drinking Water Academy

Safe Drinking Water Act

National Drinking Water Advisory Council

Water Infrastructure Security

Drinking Water For Kids!

National Drinking Water Advisory Council

EPA is committed to working with its stakeholders, the people for whom safe drinking water is an important aspect of daily and/or professional life. One of the formal means by which EPA works with its stakeholders is the National Drinking Water Advisory Council (NDWAC).

- Charter Information
- Fact Sheet

The Council, comprising members of the general public, state and local agencies, and private groups concerned with safe drinking water, advises the EPA Administrator on everything that the Agency does relating to drinking water.

- NEW National Drinking Water Advisory Council; Request for Nominations
- Full Council

NDWAC has working groups that make recommendations to the full Council, which in turn advise EPA on individual regulations, guidances, and policy matters.

These NDWAC working groups consist of approximately 20 members with a variety of viewpoints. All NDWAC working group meetings and full NDWAC meetings are open to the public.

- Working Groups
- Stage 2 Microbial/Disinfection Byproduct - Federal Advisory Committee
- Past Working Groups

Times and locations of upcoming meetings are posted in the Federal Register notices linked to on this page.

NDWAC Full Council (ALL ABOUT PDF FILES)

- **Member List**
- **Meeting Announcements**
- **Meeting Summaries**
  - May 18- 20, 2004 Meeting Summary (746K PDF FILE, 70pgs)
  - July 10, 2003 Meeting Summary (104K PDF FILE, 7 pgs)
  - June 20, 2003 Meeting Summary (117K PDF FILE, 11 pgs)
  - May 14-15, 2003 Meeting Summary (382K PDF FILE, 57 pgs)
  - December 12, 2002 Meeting Summary (16K PDF FILE, 2 pgs)
  - December 12, 2002 Full Council Conference Call (125K PDF FILE, 9 pgs)
  - December 12, 2002 Full Council Conference Call Minutes (125K PDF FILE, 9 pgs)
- **Letters to the Administrator**
  - June 28, 2004 on the Contaminant Candidate List Process Workgroup (49K PDF FILE, 2 pgs)

- August 1, 2003 transmitting Affordability Report (16K PDF FILE, 1 pg)
- July 23, 2003 on ASDWA State Capacity Report (15K PDF FILE, 1 pg)
- June 13, 2003 on draft EPA Strategic Plan (17K PDF FILE, 1pgs)
- January 8, 2003 on EPA activities related to hydrofracturing (14K PDF FILE, 1pg)

NDWAC Working Groups (ALL ABOUT PDF FILES)	
Water Security Working Group	Member List **Upcoming Meetings** ■ National Drinking Water Advisory Council's Water Security Working Group Meeting Announcement
Small Systems Affordability Work Group	Member List **Upcoming Meetings** Meeting Summaries **Reports** ■ Recommendations of the National Drinking Water Advisory Council to U.S. EPA on Its National Small Systems Affordability Criteria - July 2003 (1.6M PDF FILE)
Contaminant Candidate List (CCL) Classification Process Work Group	Member List **Upcoming Meetings** Meeting Summaries **Reports** ■ National Drinking Water Advisory Council Report on the CCL Classification Process to the U.S. Environmental Protection Agency - May 19, 2004 (652K PDF FILE, 188 pgs)

Stage 2 Microbial/Disinfection Byproduct
Federal Advisory Committee

- Charter/Member List
- Meeting Summaries

Past NDWAC Working Groups		
Benefits - Membership - Meeting summaries	**Consumer Confidence Report Rule** - Membership - Meeting summaries	**Drinking Water State Revolving Fund** - Membership - Meeting summaries
Health Care Providers - Membership - Meeting summaries	**Microbials/Disinfection Byproducts Rules** - Membership - Meeting summaries	**Occurence & Contaminant Selection** - Membership - Meeting summaries
Operator Certification - Membership - Meeting summaries	**Right-to-Know** - Membership - Meeting summaries	**Small Systems** - Membership - Meeting summaries
Small systems/ Capacity development - Membership - Meeting sumnmaries	**Source Water** - Membership - Meeting summaries	**Underground Injection Control /Source Water** - Membership - Meeting summaries
Arsenic Cost - Member List - Meeting summaries	**Contaminant Candidate List Regulatory Determinations & 6-year Review of Existing Regulations** - Membership - Meeting summaries	**Research** - Member list - Meeting summaries

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National Drinking Water Advisory Council; Request for Nominations

The U.S. Environmental Protection Agency (EPA or Agency) invites all interested persons to nominate qualified individuals to serve a three-year term as members of the National Drinking Water Advisory Council (Council). This Council was established by the Safe Drinking Water Act (SDWA) to provide practical and independent advice, consultation, and recommendations to the Agency on the activities, functions, and policies related to the implementation of the SDWA. E-mail your questions to Clare Donaher, Designated Federal Officer, donaher.clare@epa.gov, or call 202-564-3787.

Submit nominations via U.S. mail on or before August 31, 2004 to:

Clare Donaher, Designated Federal Officer
National Drinking Water Advisory Council
U.S. Environmental Protection Agency
Office of Ground Water and Drinking Water
(Mail Code 4601-M)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

June 21st, Federal Register Notice

U.S. Environmental Protection Agency

Water Security

Improving the security of our nation's drinking water and wastewater infrastructures has become a top priority since the events of 9/11. Significant actions are underway to assess and reduce vulnerabilities to potential terrorist attacks; to plan for and practice response to emergencies and incidents; and to develop new security technologies to detect and monitor contaminants and prevent security breaches.

This Web site provides resources for water utilities, state and local governments, public health officials, emergency responders and planners, assistance and training providers, environmental professionals, researchers and engineers, and law enforcement, among others.

Primary Topics	**Water Security Resources**
• Vulnerability Assessments - Tools and training to aid water utilities in assessing their vulnerabilities to adversarial actions. • Emergency / Incident Planning - Tools and training to	• Training Courses, Meetings, and Workshops / Webcasts • Tools and Technical Assistance • Grants and Funding • Publications • Related

What's New?

- New and Updated Security Product Guides
- Two-Day Workshops on Emergency Response
- New Dates for the One-Day Emergency Response Planning Workshops
- National Drinking Water Advisory Council's Water Security Working Group

Sign up for Security Source!

Receive periodic news emails from EPA

help water utilities develop a plan to respond to emergencies.

- Security Enhancements, Research and Technology - Latest scientific advances to protect drinking water and wastewater systems.
- Legislation and Directives - Homeland Security Presidential Directives and federal laws.
- A to Z Subject Index

Links
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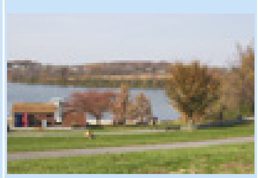
Small Systems

Resources have been designed specifically to help small water utilities better protect their water systems. |Read More|

Public Involvement

Resources are available to help concerned citizens better understand issues of water security and to help communities prepare for emergency situations affecting public health and safety. |Read More|



Information Sharing

The exchange of information between water utilities and public and private sector organizations is vital to the safety of the nation's water supply. |Read More|

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Last updated on August 11, 2004 12:50 PM
URL: http://cfpub.epa.gov/safewater/watersecurity/index.cfm

U.S. Environmental Protection Agency

Drinking Water for Kids

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  - Grades 7 - 12
- Kids' Health
- Classroom Activities & Experiments
  - Grades K - 6
  - Grades 7 - 12
- Other Kids' Stuff
- Español

Drinking Water Kids' Stuff

These links lead to great games and activities that will help you learn about drinking water. We don't ask for your name or e-mail address unless you send us a comment or question and want us to reply.

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U.S. Environmental Protection Agency

Ground Water & Drinking Water

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Drinking Water and Health Basics
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Water Infrastructure Security

Setting Standards for Safe Drinking Water

En Espanol

"A fundamental promise we must make to our people is that the food they eat and the water they drink are safe." - President Bill Clinton, Safe Drinking Water Act Reauthorization, August 6, 1996

The Safe Drinking Water Act (SDWA), passed in 1974 and amended in 1986 and 1996, gives the Environmental Protection Agency (EPA) the authority to set drinking water standards. This document describes how EPA establishes these standards.

What are drinking water standards?
Drinking water standards are regulations that EPA sets to control the level of contaminants in the nation's drinking water. These standards are part of the Safe Drinking Water Act's "multiple barrier" approach to drinking water protection, which includes assessing and protecting drinking water sources; protecting wells and collection systems; making sure water is treated by qualified operators; ensuring the integrity of distribution systems; and making information available to the public on the quality of their drinking water. With the involvement of EPA, states, tribes, drinking water utilities, communities and citizens, these multiple barriers ensure that tap water in the United States and territories is safe to drink. In most cases, EPA delegates responsibility for implementing drinking water standards to states and tribes.

There are two categories of drinking water standards:

> A **National Primary Drinking Water Regulation** (NPDWR or primary standard) is a legally-enforceable standard that applies to public water systems. Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water. They take the form of

Maximum Contaminant Levels or Treatment Techniques, which are described below.

A **National Secondary Drinking Water Regulation** (NSDWR or secondary standard) is a non-enforceable guideline regarding contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards. This information focuses on national primary standards.

Who must comply with drinking water standards?
Drinking water standards apply to public water systems (PWSs), which provide water for human consumption through at least 15 service connections, or regularly serve at least 25 individuals. Public water systems include municipal water companies, homeowner associations, schools, businesses, campgrounds and shopping malls.

Who is involved in the standard setting process?
EPA considers input from many individuals and groups throughout the rulemaking process. One of the formal means by which EPA solicits the assistance of its stakeholders is the National Drinking Water Advisory Council (NDWAC). The 15-member committee was created by the Safe Drinking Water Act. It is comprised of five members of the general public, five representatives of state and local agencies concerned with water hygiene and public water supply, and five representations of private organizations and groups demonstrating an active interest in water hygiene and public water supply, including two members who are associated with small rural public water systems. NDWAC advises EPA's Administrator on all of the agency's activities relating to drinking water.

In addition to the NDWAC, representatives from water utilities, environmental groups, public interest groups, states, tribes and the general public are encouraged to take an active role in shaping the regulations, by participating in public meetings and commenting on proposed rules. Special meetings are also held to obtain input from minority and low-income communities, as well as representatives of small businesses.

What are EPA's current priorities for regulation development?

EPA is working with stakeholders to develop the following regulations first:

Microbials, Disinfectants, and Disinfection Byproducts	EPA will strengthen control of microbial pathogens, including *Cryptosporidium*, as well as disinfectants and disinfection byproducts.	"M/DBP Cluster," of rules, 1998-2002
Radon	EPA will set a new standard for radon.	August 2000
Radionuclides	EPA will revise the current radionuclides regulation and set a new standard for uranium	November 2000
Ground Water	EPA will identify measures to protect ground water from microbial contamination	March 2003
Arsenic	EPA will revise the existing standard for arsenic	Spring 2000

How does EPA set drinking water standards?
The 1996 Amendments to Safe Drinking Water Act require EPA to go through several steps to determine, first, whether setting a standard is appropriate for a particular contaminant, and if so, what the standard should be. Peer-reviewed science and data support an intensive technological evaluation, which includes many factors: occurrence in the environment; human exposure and risks of adverse health effects in the general population and sensitive subpopulations; analytical methods of detection; technical feasibility; and impacts of regulation on water systems, the economy and public health.

Considering public input throughout the process, EPA must (1) identify drinking water problems; (2) establish priorities; and (3) set standards.

1) Identify drinking water problems.
EPA must first make determinations about which contaminants to regulate. These determinations are based on health risks and the likelihood that the contaminant occurs in public water systems at levels of concern. The National Drinking Water Contaminant Candidate List (CCL), published March 2, 1998, lists contaminants that (1) are not already regulated under SDWA; (2) may have adverse health effects; (3) are known or anticipated to occur in

public water systems; and (4) may require regulations under SDWA.

2) Establish priorities.
Contaminants on the CCL are divided into priorities for regulation, health research and occurrence data collection. By August 2001, EPA will select five or more contaminants from the regulatory priorities on the CCL and determine whether to regulate them. To support these decisions, the Agency must determine that regulating the contaminants would present a meaningful opportunity to reduce health risk. If the EPA determines regulations are necessary, the Agency must propose them by August 2003, and finali ze them by February 2005.

The Agency will also select up to 30 unregulated contaminants from the CCL for monitoring by public water systems serving at least 100,000 people. Currently, most of the unregulated contaminants with potential of occurring in drinking water are pesticides and microbes. Every five years, EPA will repeat the cycle of revising the CCL, making regulatory determinations for five contaminants and identifying up to 30 contaminants for unregulated monitoring. In addition, every six years, EPA will re-evaluate existing regulations to determine if modifications are necessary.

Beginning in August 1999, a new National Contaminant Occurrence Database will store data on regulated and unregulated chemical, radiological, microbial and physical contaminants, and other such contaminants likely to occur in finished, raw and source waters of public water systems of the United States and its territories. While EPA will be the primary user pf the NCOD, information stored in the database will be available to the public.

3) Propose and finalize a National Primary Drinking Water Regulation.
After reviewing health effects studies, EPA sets a **Maximum Contaminant Level Goal (MCLG),** the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MCLGs are non-enforceable public health goals. Since MCLGs consider only public health and not the limits of detection and treatment technology, sometimes they are set at a level which water systems cannot meet. When determining an MCLG, EPA considers the risk to sensitive subpopulations (infants, children, the elderly, and those with compromised immune systems) of experiencing a variety of adverse health effects.

- **Non-Carcinogens (not including microbial contaminants)**: For chemicals that can cause adverse non-cancer health effects, the MCLG is based on the reference dose. A **reference dose** (RFD) is an estimate of the amount of a chemical that a person can be exposed to on a daily basis that is not anticipated to cause adverse health effects over a person's lifetime. In RFD calculations, sensitive subgroups are included, and uncertainty may span an order of magnitude.

--The RFD is multiplied by typical adult body weight (70 kg) and divided by daily water consumption (2 liters) to provide a Drinking Water Equivalent Level (DWEL).

--The DWEL is multiplied by a percentage of the total daily exposure contributed by drinking water (often 20 percent) to determine the MCLG.

- **Chemical Contaminants -- Carcinogens:** If there is evidence that a chemical may cause cancer, and there is no dose below which the chemical is considered safe, the MCLG is set at zero. If a chemical is carcinogenic and a safe dose can be determined, the MCLG is set at a level above zero that is safe.

- **Microbial Contaminants:** For microbial contaminants that may present public health risk, the MCLG is set at zero because ingesting one protozoa, virus, or bacterium may cause adverse health effects. EPA is conducting studies to determine whether there is a safe level above zero for some microbial contaminants. So far, however, this has not been established.

Once the MCLG is determined, EPA sets an enforceable standard. In most cases, the standard is a **Maximum Contaminant Level (MCL)**, the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

The MCL is set as close to the MCLG as feasible, which the Safe Drinking Water Act defines as the level that may be achieved with the use of the best available technology, treatment techniques, and other means which EPA finds are available(after examination for efficiency under field conditions and not solely under laboratory conditions) are available, taking cost into consideration.

When there is no reliable method that is economically and technically feasible to measure a contaminant at particularly low concentrations, a **Treatment Technique (TT)** is set rather than an MCL. A treatment technique (TT) is an enforceable procedure or level of technological performance which public water systems must follow to ensure control of a contaminant. Examples of Treatment Technique rules are the Surface Water Treatment Rule (disinfection and filtration) and the Lead and Copper Rule (optimized corrosion control).

After determining a MCL or TT based on affordable technology for large systems, EPA must complete an economic analysis to determine whether the benefits of that standard justify the costs. If not, EPA may adjust the MCL for a particular class or group of systems to a level that "maximizes health risk reduction benefits at a cost that is justified by the benefits." EPA may not adjust the MCL if the benefits justify the costs to large systems, and small systems unlikely to receive variances.

States are authorized to grant **variances** from standards for systems serving up to 3,300 people if the system cannot afford to comply with a rule (through treatment, an alternative source of water, or other restructuring) and the system installs EPA-approved variance technology. States can grant variances to systems serving 3,301-10,000 people with EPA approval. SDWA does not allow small systems to have variances for microbial contaminants.

Under certain circumstances, **exemptions** from standards may be granted to allow extra time to seek other compliance options or financial assistance. After the exemption period expires, the PWS must be in compliance. The terms of variances and exemptions must ensure no unreasonable risk to public health.

When must public water systems comply with new primary standards?
Primary standards go into effect three years after they are finalized. If capital improvements are required, EPA's Administrator or a state may allow this period to be extended up to two additional years.

Are there special considerations for small systems?
Small systems receive special consideration from EPA and states. More than 90 percent of all PWS are small, and these systems face the greatest challenge in providing safe water at affordable rates. The 1996 SDWA Amendments provide states with tools to comply with standards affordable for small systems. When setting new primary standards, EPA must identify technologies that achieve compliance and are affordable for systems serving fewer than 10,000 people. These may include packaged or modular systems and point-of-entry/point-of-use treatment devices under the control of the water system. When such technologies cannot be identified, EPA must identify affordable technologies that maximize contaminant reduction and protect public health. Small systems are considered in three categories: serving 10,000-3301 people; 3,300-501 people; and 500-25 people.

How can I provide input?
Public meeting notices and rules open for comment are published in the *Federal Register*. The following resources provide this and other drinking water information:

> Office of Ground Water and Drinking Water web site
> http://www.epa.gov/safewater/

EPA Safe Drinking Water Hotline
1 (800) 426-4791

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Contaminants Regulated Under the Safe Drinking Water Act

	1976	1979	1986	1987	1989		1991		1992
Final Regulations	NIPDWRs 12/75; 7/76	TTHMs 11/79	Fluoride 4/86	Phase I (VOCs) 7/87	TCR 6/89	SWTR 6/89	Phase II 1/91; 7/91	LCR 6/91	Phase V 7/92
Summary of Final Action	New regs	New reg	*Revision*	New regs	*Revision*	1 *Revision* 4 New regs	38 SOCs & IOCs; 11 *Revisions* 27 New regs ~~1 Deletion~~	1 *Revision* 1 New reg	23 SOCs & IOCs: 1 *Revision* 22 New regs
# in Regulation	22	1	1	8	1	5	39	2	23
Cumulative # of regulated contaminants	22	23	23	31	31	35	61	62	84
Contaminants regulated	2,4-D 2,4,5-TP (Silvex) arsenic barium cadmium chromium coliform bacteria endrin fluoride gross alpha gross beta lead lindane mercury methoxychlor nitrate radium-226[1] radium-228[1] selenium silver toxaphene turbidity	total THMs[2]	*fluoride*	benzene carbon tetrachloride 1,2-dichloroethane p-dichlorobenzene 1,1-dichloroethylene 1,1,1-trichloroethane trichloroethylene vinyl chloride[3]	*total coliforms*[2]	Giardia[4] *turbidity*[4] HPC bacteria[4] Legionella[4] viruses[4]	*2,4-D* *2,4,5-TP* acrylamide[4] alachlor aldicarb[5] aldicarb sulfone[5] aldicarb sulfoxide[5] asbestos atrazine *barium* *cadmium* carbofuran chlordane (mono) chlorobenzene *chromium* dibromochloropropane o-dichlorobenzene cis-1,2-dichloroethylene trans-1,2-dichloroethylene 1,2-dichloropropane epichlorohydrin[4] ethylbenzene ethlyene dibromide heptachlor heptachlor epoxide *lindane* *mercury (inorganic)* *methoxychlor* *nitrate* nitrite total nitrate/nitrite PCBs pentachlorophenol *selenium* ~~silver~~ styrene tetrachlorethylene toluene *toxaphene* xylenes	copper[4] *lead*[4]	adipate, di(2-ethylhexyl) antimony beryllium cyanide dalapon dichloromethane[6] dinoseb dioxin (2,3,7,8-TCDD) diquat endothall *endrin* glyphosate hexachlorobenzene hexachlorocyclopentadiene nickel oxamyl (vydate) PAHs (benzo(a) pyrene) phthalate, di(2-ethylhexyl) picloram simazine thallium 1,2,4-trichlorobenzene 1,1,2-trichloroethane

	1995	1998		2000	2001
Final Regulations		Stage I DBPR 12/98	Interim ESWTR 12/98	Radionuclides 12/00	Arsenic 1/01
Summary of Final Action	*Remand*	1 *Revision* 6 New regs	2 *Revisions* 1 New reg	*4 Revisions* 1 new reg	*1 Revision*
# in Regulation	1	7	3	5	1
Cumulative # of regulated contaminants	83	89	90	91	91
Contaminants regulated	*nickel*	bromate chloramine chlorine chlorine dioxide chlorite haloacetic acids (HAA5)[2] *TTHMs*	Cryptosporidium *Giardia* *turbidity*	*gross alpha* *gross beta* *radium-226*[1] *radium-228*[1] uranium	*arsenic*

Notes:
1. Radium-226 and radium-228 are counted as two contaminants although their standard is combined.
2. Total THMs, haloacetic acids, and total coliforms are counted as one contaminant although both are combined standards: THMs (chloroform, bromodichloromethane, dibromochloromethane, bromoform); TC (total coliform bacteria including fecal coliforms and E.coli); HAA5 (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid, and dibromoacetic acid).
3. Vinyl chloride is also known as chloroethylene & monochloroethylene.
4. These nine contaminants have a treatment technique instead of a MCL.
5. Aldicarb, aldicarb sulfone, and aldicarb sulfoxide are considered regulated contaminants although their MCLs are stayed.
6. Dichloromethane is also known as methylene chloride.

Updated 13 February 2001
http://www.epa.gov/safewater/mcl.html

Title 40--Protection of Environment

CHAPTER I--ENVIRONMENTAL PROTECTION AGENCY

PART 141--NATIONAL PRIMARY DRINKING WATER REGULATIONS

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Microbiological Contaminants

NAME	MORE INFORMATION
Acanthamoeba (guidance expected for contact lens wearers)	
Adenoviruses	
Aeromonas hydrophila	
Caliciviruses	
Coxsackieviruses	
Cyanobacteria (blue-green algae), other freshwater algae, and their toxins	
Echoviruses	
Helicobacter pylori	
Microsporidia (Enterocytozoon & Septata)	
Mycobacterium avium intracellulare (MAC)	

Chemical Contaminants

NAME	CASRN #[1]	MORE INFORMATION
1,1,2,2-tetrachloroethane	79-34-5	
1,2,4-trimethylbenzene	95-63-6	
1,1-dichloroethane	75-34-3	
1,1-dichloropropene	563-58-6	
1,2-diphenylhydrazine	122-66-7	
1,3-dichloropropane......................................	142-28-9	
1,3-Dichloropropene	542-75-6	
2,4,6-trichlorophenol	88-06-2	
2,2-dichloropropane	594-20-7	
2,4-dichlorophenol	120-83-2	
2,4-dinitrophenol	51-28-5	
2,4-dinitrotoluene	121-14-2	
2,6-dinitrotoluene	606-20-2	
2-methyl-Phenol (o-cresol)	95-48-7	

Drinking Water For Kids!

Acetochlor	34256-82-1	
Alachlor ESA & other acetanilide pesticide degradation products	N/A	
Aldrin	309-00-2	Health Effects Analysis (3007KB PDF file, 255pgs) (ALL ABOUT PDF FILES)
Aluminum	7429-90-5	
Boron	7440-42-8	
Bromobenzene	108-86-1	
DCPA mono-acid degradate	887-54-7	
DCPA di-acid degradate	2136-79-0	
DDE.	72-55-9	
Diazinon	333-41-5	
Dieldrin	60-57-1	Health Effects Analysis (3007KB PDF file, 255pgs) (ALL ABOUT PDF FILES)
Disulfoton	298-04-4	
Diuron	330-54-1	
EPTC (s-ethyl-dipropylthiocarbamate)	759-94-4	
Fonofos	944-22-9	
Hexachlorobutadiene	87-68-3	Health Effects Analysis (1606KB PDF file, 135pgs) (ALL ABOUT PDF FILES)
p-Isopropyltoluene (p-cymene)	99-87-6	
Linuron	330-55-2	
Manganese	7439-96-5	Health Effects Analysis (574KB PDF file, 164pgs) (ALL ABOUT PDF FILES)
Methyl bromide	74-83-9	
Methyl-t-butyl ether (MTBE)	1634-04-4	
Metolachlor	51218-45-2	
Metribuzin	21087-64-9	Health Effects Analysis (836KB PDF file, 84pgs) (ALL ABOUT PDF FILES)

Molinate	2212-67-1	
Naphthalene	91-20-3	Health Effects Analysis (1028KB PDF file, 149pgs) (ALL ABOUT PDF FILES)
Nitrobenzene	98-95-3	
Organotins	N/A	
Perchlorate	N/A	
Prometon	1610-18-0	
RDX	121-82-4	
Sodium	7440-23-5	Health Effects Analysis (123KB PDF file, 34pgs) (ALL ABOUT PDF FILES)
Sulfate	14808-79-8	Health Effects Analysis (127KB PDF file, 34pgs) (ALL ABOUT PDF FILES)
Terbacil	5902-51-2	
Terbufos	13071-79-9	
Triazines & degradation products of triazines (including, but not limited to Cyanazine 21725-46-2, and atrazine-desethyl 6190-65-4)	VARIOUS	
Vanadium	7440-62-2	

NOTES

[1] **Chemical Abstract Service Registration Number** (CASRN#) - CAS Registry Numbers are used in reference works, databases, and regulatory compliance documents by many organizations around the world to identify substances with a standardized name.

- For More information see the Drinking Water Contaminant Candidate List website

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Drinking Water Contaminant Candidate List

NEW Notice of a Public Meeting To Discuss Regulatory Determinations for the Second Contaminant Candidate List (CCL 2) and Updates for Unregulated Contaminant Monitoring and the CCL 3 - September 15, 2004

What is the Drinking Water Contaminant Candidate List?

The drinking water Contaminant Candidate List (CCL) is the primary source of priority contaminants for evaluation by EPA s drinking water program. The Safe Drinking Water Act (SDWA), as amended in 1996, requires EPA to publish a list of contaminants every five years which, at the time of publication, are not subject to any proposed or promulgated national primary drinking water regulations. Contaminants on the CCL are known or anticipated to occur in public water systems and may require regulations under SDWA.

EPA conducts research on health, analytical methods, treatment technologies, effectiveness, costs,

CCL Highlights

Draft CCL 2

CCL Quick Find

The CCL as it relates to:

- The National Contaminant Occurrence Database
- The Unregulated Contaminant Monitoring Regulation
- The Review of Existing Regulations and Monitoring Requirements

Meetings of the Drinking Water Contaminant Candidate List Classification Process Work Group of The National Drinking Water Advisory Council

and occurrence for drinking water contaminants on the CCL. The Agency also develops drinking water guidance and health advisories, and makes regulatory determinations for priority contaminants on the CCL.

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When was the first CCL published?

The first CCL was published in March of 1998 and included 50 chemicals or chemical groups and 10 microbial contaminants.

- 1998 Final Drinking Water Contaminant Candidate List

How Does the CCL relate to the occurrence database and unregulated contaminant monitoring?

EPA has established a National Drinking Water Contaminant Occurrence Database (NCOD) and an Unregulated Contaminant Monitoring Regulation (UCMR) as required by SDWA.

The NCOD stores data on the occurrence of both regulated and unregulated contaminants. It provides the basis for identifying contaminants that may be placed on future CCLs and support EPA Administrator's decisions to regulate contaminants in the future. The NCOD is also expected to support the review of existing regulations and monitoring requirements every six years.

EPA developed regulations for monitoring certain unregulated contaminants in 1999. These contaminants are listed in the UCMR. The CCL Occurrence Priority list is the primary source of contaminants for the unregulated monitoring list, which must not exceed 30 contaminants.

- The CCL as it relates to: The National Contaminant Occurrence Database
- The CCL as it related to: The Unregulated Contaminant Monitoring Regulation

For what contaminants did EPA make regulatory determinations?

On July 18, 2003, EPA announced its final determinations for a subset of contaminants on the 1998 CCL (68 FR 42898), which concluded that sufficient data and information were available to make the determination that a regulation was not appropriate for the following nine contaminants: Acanthamoeba, aldrin, dieldrin, hexachlorobutadiene, manganese, metribuzin, naphthalene, sodium, and sulfate.

- Regulatory Determinations for Priority Contaminants on the

Drinking Water Contaminant Candidate List

What contaminants are included in the Draft CCL 2?

On April 2, 2004 EPA announced its preliminary decision to carry over the remaining 51 contaminants (nine microbiological and 42 chemical contaminants or contaminant groups). For the list see the tables in both the 1998 CCL and the Draft CCL 2. This will allow the Agency to continue with research and data collection activities related to the list, prepare to make regulatory determinations in the 2006 time-frame using the data collected from these activities, and to focus resources on completing ongoing work with the National Drinking Water Advisory Council (NDWAC) on an expanded process for classifying drinking water contaminants in the future.

Comments may be submitted by following the instructions provided in the notice and must be received or postmarked by midnight June 1, 2004.

For questions about the Draft CCL 2 or the Federal Register Notice, contact EPA's Safe Drinking Water Hotline at (800) 426-4791 or e-mail: sdwhotline@bah.com.

- Draft CCL 2 Federal Register Notice (comment period ended June 1, 2004)

What approach did EPA use to develop the Draft CCL 2?

The Agency s approach to the Draft CCL 2 is to continue using the remaining contaminants on the 1998 CCL for prioritizing research and making regulatory determinations while working with the NDWAC (The NDWAC provides independent advice, consultations, and recommendations to EPA on matters related to the activities, function, and policies of the Agency under the SDWA) and stakeholders to complete a review of the National Research Council (NRC) recommendations for developing a more comprehensive and transparent CCL listing process.

The NRC identified a number of opportunities to strengthen and expand the analytical process upon which the 1998 CCL was based. The NRC recommendations focused on developing a larger initial list and on identifying new approaches for screening larger numbers of potential CCL contaminants. While the NRC recommendations would expand the universe of contaminants and suggest a change in the manner in which contaminants are selected for the CCL, they are based on the same fundamental principles used in developing the 1998 CCL -- a focus on health impacts and contaminant occurrence.

- National Drinking Water Advisory Council

Does the Draft CCL 2 impose any requirements?

No, neither this Draft CCL 2 nor the Final CCL 2, when published, imposes any requirements on anyone. Contaminants on the list may become the subject of future regulations. The public would be provided additional opportunities to comment as part of the rule making process.

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Unregulated Contaminant Monitoring Rule (UCMR) 1999

NEW UCMR Data Available

(You can also link from "Access UCMR Data" under "Important UCMR Links")

EPA revised (September 17, 1999) the Unregulated Contaminant Monitoring Rule. EPA uses the data generated by the new UCMR to evaluate and prioritize contaminants on the Drinking Water Contaminant Candidate List, a list of contaminants EPA is considering for possible new drinking water standards. These data help to ensure that EPA has the high quality scientific data it needs to make decisions about future drinking water standards. Click here to read the rule in HTML or PDF.

Important UCMR Links

- Frequently Asked Questions
- Rule & Guidance
- List of UCM Contaminants
- Methods
- Participating Utilities
- Participating Labs
- UCMR Update
- Reporting
- Access UCMR Data
- Federal Register Notices
- Timeline

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On March 2, 2000, EPA published a rule [read in HTML or PDF] specifying the approved analytical methods for perchlorate and acetochlor. On January 11, 2001, EPA published analytical methods [read in HTML or PDF] for Screening Survey List 2 contaminants, and required monitoring for those contaminants in drinking water. On September 4, 2001, EPA published an amendment [read in PDF] to UCMR List 2 concerning laboratory approval for Method 515.4. EPA also delayed the requirement for electronic reporting of unregulated contaminant monitoring results.

On October 29, 2002, EPA published a rule [read in PDF] to approve EPA Method 1605 to monitor the Screening Survey List 2 microbiological contaminant *Aeromonas*. The rule also specifies that laboratories wishing to be approved for this method must participate in an *Aeromonas* proficiency testing (PT) program conducted by EPA.

EPA National Primary Drinking Water Standards

	Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Acrylamide	TT[8]	Nervous system or blood problems;	Added to water during sewage/wastewater increased risk of cancer treatment	zero
OC	Alachlor	0.002	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops	zero
R	Alpha particles	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation	zero
IOC	Antimony	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	0.006
IOC	Arsenic	0.010 as of 1/23/06	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards, runoff from glass & electronics production wastes	0
IOC	Asbestos (fibers >10 micrometers)	7 million fibers per Liter (MFL)	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits	7 MFL
OC	Atrazine	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops	0.003
IOC	Barium	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	2
OC	Benzene	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills	zero
OC	Benzo(a)pyrene (PAHs)	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines	zero
IOC	Beryllium	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	0.004
R	Beta particles and photon emitters	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation	zero
DBP	Bromate	0.010	Increased risk of cancer	Byproduct of drinking water disinfection	zero
IOC	Cadmium	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	0.005
OC	Carbofuran	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa	0.04
OC	Carbon tetrachloride	0.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities	zero
D	Chloramines (as Cl_2)	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort, anemia	Water additive used to control microbes	MRDLG=4[1]

LEGEND

D	Dinsinfectant	IOC	Inorganic Chemical	OC	Organic Chemical
DBP	Disinfection Byproduct	M	Microorganism	R	Radionuclides

	Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Chlordane	0.002	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide	zero
D	Chlorine (as Cl_2)	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort	Water additive used to control microbes	MRDLG=4[1]
D	Chlorine dioxide (as ClO_2)	MRDL=0.8[1]	Anemia; infants & young children: nervous system effects	Water additive used to control microbes	MRDLG=0.8[1]
DBP	Chlorite	1.0	Anemia; infants & young children: nervous system effects	Byproduct of drinking water disinfection	0.8
OC	Chlorobenzene	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories	0.1
IOC	Chromium (total)	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits	0.1
IOC	Copper	TT[7]; Action Level = 1.3	Short term exposure: Gastrointestinal distress. Long term exposure: Liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level	Corrosion of household plumbing systems; erosion of natural deposits	1.3
M	*Cryptosporidium*	TT[3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
IOC	Cyanide (as free cyanide)	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories	0.2
OC	2,4-D	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops	0.07
OC	Dalapon	0.2	Minor kidney changes	Runoff from herbicide used on rights of way	0.2
OC	1,2-Dibromo-3-chloropropane (DBCP)	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards	zero
OC	o-Dichlorobenzene	0.6	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories	0.6
OC	p-Dichlorobenzene	0.075	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories	0.075
OC	1,2-Dichloroethane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	zero
OC	1,1-Dichloroethylene	0.007	Liver problems	Discharge from industrial chemical factories	0.007
OC	cis-1,2-Dichloroethylene	0.07	Liver problems	Discharge from industrial chemical factories	0.07
OC	trans-1,2-Dichloroethylene	0.1	Liver problems	Discharge from industrial chemical factories	0.1
OC	Dichloromethane	0.005	Liver problems; increased risk of cancer	Discharge from drug and chemical factories	zero
OC	1,2-Dichloropropane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	zero
OC	Di(2-ethylhexyl) adipate	0.4	Weight loss, live problems, or possible reproductive difficulties	Discharge from chemical factories	0.4
OC	Di(2-ethylhexyl) phthalate	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories	zero
OC	Dinoseb	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables	0.007
OC	Dioxin (2,3,7,8-TCDD)	0.00000003	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories	zero
OC	Diquat	0.02	Cataracts	Runoff from herbicide use	0.02
OC	Endothall	0.1	Stomach and intestinal problems	Runoff from herbicide use	0.1

LEGEND

D	Dinsinfectant	IOC	Inorganic Chemical	OC	Organic Chemical
DBP	Disinfection Byproduct	M	Microorganism	R	Radionuclides

	Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Endrin	0.002	Liver problems	Residue of banned insecticide	0.002
OC	Epichlorohydrin	TT[8]	Increased cancer risk, and over a long period of time, stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals	zero
OC	Ethylbenzene	0.7	Liver or kidneys problems	Discharge from petroleum refineries	0.7
OC	Ethylene dibromide	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries	zero
IOC	Fluoride	4.0	Bone disease (pain and tenderness of the bones); Children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories	4.0
M	*Giardia lamblia*	TT[3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
OC	Glyphosate	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use	0.7
DBP	Haloacetic acids (HAA5)	0.060	Increased risk of cancer	Byproduct of drinking water disinfection	n/a[6]
OC	Heptachlor	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide	zero
OC	Heptachlor epoxide	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor	zero
M	Heterotrophic plate count (HPC)	TT[3]	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment	n/a
OC	Hexachlorobenzene	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories	zero
OC	Hexachlorocyclopentadien e	0.05	Kidney or stomach problems	Discharge from chemical factories	0.05
IOC	Lead	TT[7]; Action Level = 0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities; Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits	zero
M	*Legionella*	TT[3]	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems	zero
OC	Lindane	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, gardens	0.0002
IOC	Mercury (inorganic)	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands	0.002
OC	Methoxychlor	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock	0.04
IOC	Nitrate (measured as Nitrogen)	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	10
IOC	Nitrite (measured as Nitrogen)	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	1

LEGEND

D	Dinsinfectant	IOC	Inorganic Chemical	OC	Organic Chemical
DBP	Disinfection Byproduct	M	Microorganism	R	Radionuclides

	Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Oxamyl (Vydate)	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes	0.2
OC	Pentachlorophenol	0.001	Liver or kidney problems; increased cancer risk	Discharge from wood preserving factories	zero
OC	Picloram	0.5	Liver problems	Herbicide runoff	0.5
OC	Polychlorinated biphenyls (PCBs)	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals	zero
R	Radium 226 and Radium 228 (combined)	5 pCi/L	Increased risk of cancer	Erosion of natural deposits	zero
IOC	Selenium	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines	0.05
OC	Simazine	0.004	Problems with blood	Herbicide runoff	0.004
OC	Styrene	0.1	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills	0.1
OC	Tetrachloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners	zero
IOC	Thallium	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories	0.0005
OC	Toluene	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories	1
M	Total Coliforms (including fecal coliform and *E. coli*)	5.0%[4]	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present[5]	Coliforms are naturally present in the environment as well as feces; fecal coliforms and *E. coli* only come from human and animal fecal waste.	zero
DBP	Total Trihalomethanes (TTHMs)	0.10 0.080 after 12/31/03	Liver, kidney or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection	n/a[6]
OC	Toxaphene	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle	zero
OC	2,4,5-TP (Silvex)	0.05	Liver problems	Residue of banned herbicide	0.05
OC	1,2,4-Trichlorobenzene	0.07	Changes in adrenal glands	Discharge from textile finishing factories	0.07
OC	1,1,1-Trichloroethane	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories	0.20
OC	1,1,2-Trichloroethane	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories	0.003
OC	Trichloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories	zero
M	Turbidity	TT[3]	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing micro-organisms such as viruses, parasites and some bacteria. These organisms can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff	n/a
R	Uranium	30 ug/L as of 12/08/03	Increased risk of cancer, kidney toxicity	Erosion of natural deposits	zero

LEGEND

D	Dinsinfectant	IOC	Inorganic Chemical	OC	Organic Chemical
DBP	Disinfection Byproduct	M	Microorganism	R	Radionuclides

	Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Vinyl chloride	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories	zero
M	Viruses (enteric)	TT[3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
OC	Xylenes (total)	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories	10

NOTES

1 Definitions

- Maximum Contaminant Level Goal (MCLG)—The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
- Maximum Contaminant Level (MCL)—The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
- Maximum Residual Disinfectant Level Goal (MRDLG)—The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- Maximum Residual Disinfectant Level (MRDL)—The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- Treatment Technique (TT)—A required process intended to reduce the level of a contaminant in drinking water.

2 Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million (ppm).

3 EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:

- *Cryptosporidium* (as of 1/1/02 for systems serving >10,000 and 1/14/05 for systems serving <10,000) 99% removal.
- *Giardia lamblia*: 99.9% removal/inactivation
- Viruses: 99.99% removal/inactivation
- *Legionella:* No limit, but EPA believes that if *Giardia* and viruses are removed/inactivated, *Legionella* will also be controlled.
- Turbidity: At no time can turbidity (cloudiness of water) go above 5 nephelolometric turbidity units (NTU); systems that filter must ensure that the turbidity go no higher than 1 NTU (0.5 NTU for conventional or direct filtration) in at least 95% of the daily samples in any month. As of January 1, 2002, for systems servicing >10,000, and January 14, 2005, for systems servicing <10,000, turbidity may never exceed 1 NTU, and must not exceed 0.3 NTU in 95% of daily samples in any month.
- HPC: No more than 500 bacterial colonies per milliliter
- Long Term 1 Enhanced Surface Water Treatment (Effective Date: January 14, 2005); Surface water systems or (GWUDI) systems serving fewer than 10,000 people must comply with the applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, *Cryptosporidium* removal requirements, updated watershed control requirements for unfiltered systems).
- Filter Backwash Recycling: The Filter Backwash Recycling Rule requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.

4 No more than 5.0% samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or *E. coli* if two consecutive TC-positive samples, and one is also positive for *E. coli* fecal coliforms, system has an acute MCL violation.

5 Fecal coliform and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Disease-causing microbes (pathogens) in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. These pathogens may pose a special health risk for infants, young children, and people with severely compromised immune systems.

6 Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:

- Haloacetic acids: dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L)
- Trihalomethanes: bromodichloromethane (zero); bromoform (zero); dibromochloromethane (0.06 mg/L)

7 Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

8 Each water system must certify, in writing, to the state (using third-party or manufacturers certification) that when it uses acrylamide and/or epichlorohydrin to treat water, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows: Acrylamide = 0.05% dosed at 1 mg/L (or equivalent); Epichlorohydrin = 0.01% dosed at 20 mg/L (or equivalent).

LEGEND

D	Dinsinfectant	IOC	Inorganic Chemical	OC	Organic Chemical
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National Secondary Drinking Water Standards

National Secondary Drinking Water Standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

Contaminant	Secondary Standard
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

Office of Water (4606M)
EPA 816-F-03-016
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Drinking Water and Health Basics

Frequently Asked Questions

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Drinking Water For Kids!

E. coli 0157:H7 in drinking water -- US EPA

E. coli in drinking water

One of hundreds of strains of the bacterium *Escherichia coli*, *E. coli* O157:H7 is an emerging cause of foodborne and waterborne illness. Although most strains of *E. coli* are harmless and live in the intestines of healthy humans and animals, this strain produces a powerful toxin and can cause severe illness. *E. coli* O157:H7 was first recognized as a cause of illness during an outbreak in 1982 traced to contaminated hamburgers. Since then, most infections are believed to have come from eating undercooked ground beef.

However, some have been waterborne. In 1999, people became sick after drinking contaminated water in Washington County, New York and swimming in contaminated water in Clark County, Washington. Information about the health effects of *E. coli* O157:H7, and actions you can take to protect yourself and your family from *E. coli* infection is provided below. You can also read the Centers for Disease Control and Prevention's fact sheet on E. coli EXIT disclaimer and the Food and Drug Administration's Bad Bug Book. EXIT disclaimer

What is _E. coli_ and where does it come from?

E. coli is a type of fecal coliform bacteria commonly found in the intestines of animals and humans. *E. coli* is short for *Escherichia coli*. The presence of *E. coli* in water is a strong indication of recent sewage or animal waste contamination. Sewage may contain many types of disease-causing organisms.

What are fecal coliforms?

Fecal coliforms are bacteria that are associated with human or animal wastes. They usually live in human or animal intestinal tracts, and their presence in drinking water is a strong indication of recent sewage or animal waste contamination.

How does E. coli or other fecal coliforms get in the water?

E. coli comes from human and animal wastes. During rainfalls, snow melts, or other types of precipitation, *E. coli* may be washed into creeks, rivers, streams, lakes, or groundwater. When these waters are used as sources of drinking water and the water is not treated or inadequately treated, *E. coli* may end up in drinking water.

What are the health effects of *E. coli* O157:H7?

E. coli O157:H7 is one of hundreds of strains of the bacterium *E. coli*. Although most strains are harmless and live in the intestines of healthy humans and animals, this strain produces a powerful toxin and can cause severe illness. Infection often causes severe bloody diarrhea and abdominal cramps; sometimes the infection causes non-bloody diarrhea. Frequently, no fever is present. It should be noted that these symptoms are common to a variety of diseases, and may be caused by sources other than contaminated drinking water.

In some people, particularly children under 5 years of age and the elderly, the infection can also cause a complication called hemolytic uremic syndrome, in which the red blood cells are destroyed and the kidneys fail. About 2%-7% of infections lead to this complication. In the United States, hemolytic uremic syndrome is the principal cause of acute kidney failure in children, and most cases of hemolytic uremic syndrome are caused by *E. coli* O157:H7. Hemolytic uremic syndrome is a life-threatening condition usually treated in an intensive care unit. Blood transfusions and kidney dialysis are often required. With intensive care, the death rate for hemolytic uremic syndrome is 3%-5%.

How long does it take for these symptoms of *E. coli* O157:H7 infection to occur?

Symptoms usually appear within 2 to 4 days, but can take up to 8 days. Most people recover without antibiotics or other specific treatment in 5-10 days. There is no evidence that antibiotics improve the course of disease, and it is thought that treatment with some antibiotics may precipitate kidney complications. Antidiarrheal agents, such as loperamide (Imodium), should also be avoided.

What should I do if I have any of the above symptoms?

Consult with your physician. Infection with *E. coli* O157:H7 is diagnosed by detecting the bacterium in the stool. Most laboratories that culture stool do not test for *E. coli* O157:H7, so it is important to request that the stool specimen be tested on sorbitol-MacConkey (SMAC) agar for this organism. All persons who suddenly have diarrhea with blood should get their stool tested for *E. coli* O157:H7.

Are there groups of people who are at greater risk of getting any of the symptoms?

Children under the age of five, the elderly, and people whose health is weakened (i.e., people who have long-term illnesses such as cancer or AIDS) are at greater risk of severe illness.

What should these people who are at greater risk do? Are there any additional precautions they should take?

People who are at greater risk should consult with their doctor or health care provider and follow the instructions provided.

How will I know if my water is safe?

If you get your water from a public water system, then your water system is required by law to notify you if your water is not safe. If you are interested in obtaining information about your drinking water, consult the water quality report that you should receive annually from your local water system, or call your local water system directly. Information on local water systems is also available on EPA's web site at www.epa.gov/safewater/dwinfo.htm.

How is water treated to protect me from *E. coli*?

The water can be treated using chlorine, ultra-violet light, or ozone, all of which act to kill or inactivate *E. coli*. Systems using surface water sources are required to disinfect to ensure that all bacterial contamination is inactivated, such as *E. coli*. Systems using ground water sources are not required to disinfect, although many of them do.

If I have a private well, how can I have it tested for *E. coli*?

If you have a private well, you should have your water tested periodically. Contact your State laboratory certification officer to find out which laboratories have been certified for conducting total coliform analyses. (You may contact the Safe Drinking Water Hotline at 1-800-426-4791 for the address and phone number of this individual.) Then contact a certified lab near you and get instructions on how to send them a water sample. Typically, the lab will first test for total coliforms, which is a group of related organisms that is common in both the environment and in the gut of animals. If the sample is positive for total coliforms, the lab will determine whether *E. coli* is also present. *E. coli* is a type of total coliform that is closely associated with recent fecal contamination. Few *E. coli* strains cause disease. However, the presence of any *E. coli* in a water sample suggests that disease-causing organisms, are also likely to be present.

One of the strains of *E. coli* that causes disease is *E. coli* O157:H7. EPA does not believe it necessary for an owner of a private well to test specifically for this organism under normal circumstances. If *E. coli* O157:H7 is present in your well, it is highly likely that other strains of *E. coli* are also present. If a well is *E. coli*-positive, regardless of strain, you should not drink the water unless it is disinfected. Several tests are available for determining whether *E. coli* O157:H7 is present, but they are somewhat more expensive than the standard *E. coli* tests and many labs may not have the expertise or supplies to perform these tests. Your state's laboratory certification officer should be able to tell you which laboratories can perform these tests, or you can contact the lab directly.

If my well is contaminated with *E. coli*, what can I do to protect myself?

If your well tests positive for *E. coli*, do not drink the water unless you boil it for at least one minute at a rolling boil, longer if you live at high altitudes. You may also disinfect the well according to procedures recommended by your local health department. Monitor your water periodically after disinfection to make certain that the problem does not recur. If the contamination is a recurring problem, you should investigate the feasibility of drilling a new well or install a point-of-entry disinfection unit, which can use chlorine, ultraviolet light, or ozone.

How does the U.S. Environmental Protection Agency regulate *E. coli*?

According to EPA regulations, a system that operates at least 60 days per year, and serves 25 people or more or has 15 or more service connections, is regulated as a public water system under the Safe Drinking Water Act. If a system is not a public water system as defined by EPA's regulations, it is not regulated under the Safe Drinking Water Act, although it may be regulated by state or local authorities.

Under the Safe Drinking Water Act, EPA requires public water systems to monitor for coliform bacteria. Systems analyze first for total coliform, because this test is faster to produce results. Any time that a sample is positive for total coliform, the same sample must be analyzed for either fecal coliform or *E. coli*. Both are indicators of contamination with animal waste or human sewage.

The largest public water systems (serving millions of people) must take at least 480 samples per month. Smaller systems must take at least five samples a month unless the state has conducted a sanitary survey – a survey in which a state inspector examines system components and ensures they will protect public health – at the system within the last five years.

Systems serving 25 to 1,000 people typically take one sample per month. Some states reduce this frequency to quarterly for ground water systems if a recent sanitary survey shows that the system is free of sanitary defects. Some types of systems can qualify for annual monitoring.

Systems using surface water, rather than ground water, are required to take extra steps to protect against bacterial contamination because surface water sources are more vulnerable to such contamination. At a minimum, all systems using surface waters must disinfect. Disinfection will kill *E. coli* O157:H7.

What can I do to protect myself from *E. coli* O157:H7 in drinking water?

Approximately 89 percent of Americans are receiving water from community water systems that meet all health-based standards. Your public water system is required to notify you if, for any reason, your drinking water is not safe. If you wish to take extra precautions, you can boil your water for one minute at a rolling boil, longer at higher altitudes. To find out more information about your water, see the Consumer Confidence Report from your local water supplier or contact your local water supplier directly. You can also obtain information about your local water system on EPA's web site at www.epa.gov/safewater/dwinfo.htm.

If you draw water from a private well, you can contact your state health department to obtain information on how to have your well tested for total coliforms and *E. coli* contamination. If your well tests positive for *E. coli*, there are several steps that you should take: (1) begin boiling all water intended for consumption, (2) disinfect the well according to procedures recommended by your local health department, and (3) monitor your water quality to make certain that the problem does not recur. If the contamination is a recurring problem, you should investigate the feasibility of drilling a new well or install a point-of-entry disinfection unit, which can use chlorine, ultraviolet light, or ozone.

The Centers for Disease Control and Prevention (CDC) suggests other actions that you may take to prevent *E. coli* infection. These include:

- Avoid swallowing lake or pool water while swimming.
- Thoroughly cook ground beef and avoid unpasteurized milk.
- Make sure that persons with diarrhea, especially children, wash their hands carefully with soap after bowel movements to reduce the risk of spreading infection, and that persons wash hands

after changing soiled diapers. Anyone with a diarrheal illness should avoid swimming in public pools or lakes, sharing baths with others, and preparing food for others.

- Cook all ground beef and hamburger thoroughly. Because ground beef can turn brown before disease-causing bacteria are killed, use a digital instant-read meat thermometer to ensure thorough cooking. Ground beef should be cooked until a thermometer inserted into several parts of the patty, including the thickest part, reads at least 160º F. Persons who cook ground beef without using a thermometer can decrease their risk of illness by not eating ground beef patties that are still pink in the middle.
- If you are served an undercooked hamburger or other ground beef product in a restaurant, send it back for further cooking. You may want to ask for a new bun and a clean plate, too.
- Avoid spreading harmful bacteria in your kitchen. Keep raw meat separate from ready-to-eat foods. Wash hands, counters, and utensils with hot soapy water after they touch raw meat. Never place cooked hamburgers or ground beef on the unwashed plate that held raw patties. Wash meat thermometers in between tests of patties that require further cooking.
- Drink only pasteurized milk, juice, or cider. Commercial juice with an extended shelf-life that is sold at room temperature (e.g. juice in cardboard boxes, vacuum sealed juice in glass containers) has been pasteurized, although this is generally not indicated on the label. Juice concentrates are also heated sufficiently to kill pathogens.
- Wash fruits and vegetables thoroughly, especially those that will not be cooked. Children under 5 years of age, immunocompromised persons, and the elderly should avoid eating alfalfa sprouts until their safety can be assured. Methods to decontaminate alfalfa seeds and sprouts are being investigated.

Will a water filter work to keep *E. coli* out of my water?

Most in-home filters will not. EPA recommends that you boil your water if you are concerned about its safety.

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

Overview of the Rule

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

Public Health Benefits

Implementation of the Stage 1 DBPR will result in . . .	‣ As many as 140 million people receiving increased protection from DBPs. ‣ 24 percent average reduction nationally in trihalomethane levels. ‣ Reduction in exposure to the major DBPs from use of ozone (DBP = bromate) and chlorine dioxide (DBP = chlorite).
Estimated impacts of the Stage 1 DBPR include . . .	‣ National capital costs: $2.3 billion ‣ National total annualized costs to utilities: $684 million ‣ 95 percent of households will incur an increase of less than $1 per month. ‣ 4 percent of households will incur an increase of $1-10 per month. ‣ <1 percent of households will incur an increase of $10-33 per month.

Critical Deadlines and Requirements

For Drinking Water Systems	
January 1, 2002	Surface water systems and ground water systems under the direct influence of surface water serving ≥ 10,000 people must comply with the Stage 1 DBPR requirements.
January 1, 2004	Surface water systems and ground water systems under the direct influence of surface water serving < 10,000, and all ground water systems must comply with the Stage 1 DBPR requirements.
For States	
December 16, 2000	States submit Stage 1 DBPR primacy revision applications to EPA (triggers interim primacy).
December 16, 2002	Primacy extension deadline - all states with an extension must submit primacy revision applications to EPA.

For additional information on the Stage 1 DBPR

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

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

Regulated Contaminants/Disinfectants

Regulated Contaminants	MCL (mg/L)	MCLG (mg/L)	Regulated Disinfectants	MRDL* (mg/L)	MRDLG* (mg/L)
Total Trihalomethanes (TTHM)	**0.080**		**Chlorine**	**4.0 as Cl_2**	**4**
Chloroform Bromodichloromethane Dibromochloromethane Bromoform		- zero 0.06 zero			
Five Haloacetic Acids (HAA5)	**0.060**		**Chloramines**	**4.0 as Cl_2**	**4**
Monochloroacetic acid Dichloroacetic acid Trichloroacetic acid Bromoacetic acid Dibromoacetic acid		- zero 0.3 - -	**Chlorine dioxide**	**0.8**	**0.8**
Bromate (plants that use ozone)	**0.010**	**zero**	***Stage 1 DBPR includes maximum residual disinfectant levels (MRDLs) and maximum residual disinfectant level goals (MRDLGs) which are similar to MCLs and MCLGs, but for disinfectants.**		
Chlorite (plants that use chlorine dioxide)	**1.0**	**0.8**			

Treatment Technique

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

Step 1 TOC Table - Required % Removal of TOC

Source Water TOC (mg/L)	Source Water Alkalinity, mg/L as $CaCO_3$		
	0-60	> 60-120	> 120
> 2.0 to 4.0	35.0%	25.0%	15.0%
> 4.0 to 8.0	45.0%	35.0%	25.0%
> 8.0	50.0%	40.0%	30.0%

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

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

Routine Monitoring Requirements

	Coverage	Monitoring Frequency	Compliance
TTHM/HAA5	Surface and ground water under the direct influence of surface water serving ³ 10,000	4/plant/quarter	Running annual average
	Surface and ground water under the direct influence of surface water serving 500 - 9,999	1/plant/quarter	Running annual average
	Surface and ground water under the direct influence of surface water serving < 500	1/plant/year in month of warmest water temperature**	Running annual average of increased monitoring
	Ground water serving ³ 10,000	1/plant/quarter	Running annual average
	Ground water serving < 10,000	1/plant/year in month of warmest water temperature**	Running annual average of increased monitoring
Bromate	Ozone plants	Monthly	Running annual average
Chlorite	Chlorine dioxide plants	Daily at entrance to distribution system; monthly in distribution system	Daily/follow-up monitoring
Chlorine dioxide	Chlorine dioxide plants	Daily at entrance to distribution system	Daily/follow-up monitoring
Chlorine/Chloramines	All systems	Same location and frequency as TCR sampling	Running annual average
DBP precursors	Conventional filtration	Monthly for total organic carbon and alkalinity	Running annual average

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

Consumer Factsheet on: ANTIMONY

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Antimony and how is it used?

Antimony is a metal found in natural deposits as ores containing other elements. The most widely used antimony compound is antimony trioxide, used as a flame retardant. It is also found in batteries, pigments, and ceramics/glass.

Why is Antimony being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for antimony has been set at 6 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 6 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are

met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found antimony to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: nausea, vomiting and diarrhea.

Long-term: Antimony has the potential to cause the following effects from a lifetime exposure at levels above the MCL: AND/OR- Antimony is a (known/potential drinking water) human carcinogen. OR- No reliable data are available concerning health effects from long-term exposure to antimony in drinking water.

How much Antimony is produced and released to the environment?

In 1984, 64.5 million lbs. antimony ore was mined and refined. Production of the most commonly used antimony compound, the trioxide, increased during the 1980s to about 31 million lbs, reported in 1985. Industrial dust, auto exhaust and home heating oil are the main sources in urban air.

From 1987 to 1993, according to the Toxics Release Inventory antimony and antimony compound releases to land and water totaled over 12 million lbs. These releases were primarily from copper and lead smelting and refining industries. The largest releases occurred in Arizona and Montana. The greatest releases to water occurred in Washington and Louisiana.

What happens to Antimony when it is released to the environment?

Little is known about antimonys fate once released to soil. Some studies indicate that antimony is highly mobile in soils, while others conclude that it strongly adsorbs to soil. In water, it usually adheres to sediments. Most antimony compounds show little or no tendency to accumulate in aquatic life.

How will Antimony be Detected in and Removed from My Drinking Water?

The regulation for antimony became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if antimony is present above 6 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of antimony so that it is consistently below that level. The following treatment methods have been approved by EPA for removing antimony: Coagulation/Filtration, Reverse Osmosis.

How will I know if Antimony is in my drinking water?

If the levels of antimony exceed the MCL, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

MCLG: 6 ppb

MCL: 6 ppb

Antimony Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	**Land**
TOTALS	**330,064**	**12,003,373**

Top Ten States *		
AZ	505	7,074,128
MT	0	2,338,697
TX	24,817	840,392
LA	55,414	344,762
WI	1,445	392,000
MO	784	188,266
WA	63,220	99,915
ID	2,600	140,250
TN	687	108,325
AL	27,536	69,503

Major Industries*		
Copper smelting, refining	505	7,074,128
Other nonferrous smelt.	17,015	2,383,947
Sec. nonferrous smelt.	1,459	803,398
Misc Indust. Organics	18,424	581,465
Porcelain plumb. fixtures	1,445	392,000

Petroleum refining	111,527	202,251
Misc Inorganic chems.	4,962	140,250
Plastics, resins	20	60,372
Storage batteries	0	45,952
Synthetic fibers	26,803	12,535

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

EPA strongly encourages people to learn more about their drinking water, and to support local efforts to protect and upgrade the supply of safe drinking water. Your water bill or telephone books government listings are a good starting point.

Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated. Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346.

U.S. Environmental Protection Agency

Ground Water & Drinking Water

Arsenic in Drinking Water

The Safe Drinking Water Act requires EPA to revise the existing 50 parts per billion (ppb) standard for arsenic in drinking water. On January 22, 2001 EPA adopted a new standard (read online) ~ (PDF file), and public water systems must comply with the 10 ppb standard beginning January 23, 2006. The Final August 2002 Implementation Guidance for the Arsenic Rule and Clarifications to Compliance and New Source Contaminants Monitoring and training information may be viewed at http://www.epa.gov/safewater/ars/implement.html.

Information about EPA s arsenic small system treatment research program, including the application for EPA s 2003 treatment demonstration studies, is available at http://www.epa.gov/ORD/NRMRL/arsenic.

NEW Minor Clarification of National Primary Drinking Water Regulation for Arsenic - Final Rule

EPA is affirming that the public health standard for arsenic in drinking water established in January 2001 is 10 parts per billion (ppb). In today s action, EPA is making clear that when a monitoring result is expressed in milligrams per liter (mg/L) rather than ppb, that any monitoring result greater than 0.010 mg/l is a violation of the January 2001 arsenic standard. To assure that this clarification extends to the regulatory text for arsenic and to remove any implementation uncertainty relating to this issue, EPA has amendended the arsenic Maximum Contaminant Level (MCL) to express it as 0.010 mg/l.

- Federal Register Notice
  - Minor Clarification of National Primary Drinking Water Regulation for Arsenic

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The information below provides a history of EPA's rulemaking efforts related to arsenic and the various technical and factual information associated with those efforts.

Report to Congress
The Agency's report to Congress, "Small System Arsenic Implementation Issues", may be viewed or downloaded at this link along with a synopsis of the report. [Full Report (PDF file), Synopsis (PDF File)] This March 2002 report describes three major activities that address an Agency review of national-level affordability criteria for drinking water rules and small systems implementation issues related to the new arsenic in drinking water standard.

Review of the 10ppb Standard
After publishing the final arsenic rule on January 22, 2001, EPA postponed the effective date of the rule until February 22, 2002, requested public comment on the standard, and began reviewing the new standard, the science, costs and benefits analyses that supported the regulation. [A]s announced by the Administrator on October 31, 2001, EPA will not further postpone the January 2001 rule (PDF file), and EPA also does not expect to take any other additional action relative to the July 2001 proposal in the interim (April 17, 2002 Federal Register notice, 67 FR 19030, footnote 3 of Table III-2 at 19037). The Agency will continue to evaluate the three expert panel reports discussed below, public comments on the standard and the reports, and other relevant information as they become available. EPA expects to make a final decision on whether to revise the January 2001 rule as part of the next six-year review of drinking water standards, which is due in August 2008.

Three Expert Panel Reviews

Reports and recommendations on the science, cost of compliance, and benefits analyses in support of the 10 ppb final arsenic in drinking water rule were made available for review and public comment until October 31, 2001 [(read online) (PDF file)]. These reports were prepared by independent, expert panels convened by the National Academy of Sciences, the National Drinking Water Advisory Council, and the EPA

Science Advisory Board.

- The National Academy of Sciences: "Arsenic in Drinking Water: 2001 Update" EXIT disclaimer (September 12, 2001)

- The National Drinking Water Advisory Council: Cost review report (PDF file) with a cover letter to Administrator Christine Todd Whitman (read online). (August 23, 2001)

- EPA's Science Advisory Board: Review of the Arsenic Rule Benefits Analysis (PDF file) (August 30, 2001)

Request for comment on the new Arsenic standard
On July 19, 2001 (66 FR 37617) , EPA issued a proposal [(read online) (PDF file)] to request comment on whether the data and technical analyses associated with the January 2001 arsenic rule support setting the arsenic standard at 3 ppb, 5 ppb, 10 ppb, or 20 ppb. On August 16, 2001, EPA provided a separate docket electronic mail (e-mail) address, ow-arsenic-docket@epa.gov, to help the Agency process comments [(read online) (PDF file)] on the July 19th proposed rule. The comment period closed October 31, 2001.

Health effects and risk review
The National Academy of Sciences' (NAS) National Research Council's subcommittee on arsenic held meetings on May 21, June 20, and July 18, 2001. NAS has posted information on the scope of the study, membership, meetings, and meeting summaries of the closed sessions. EXIT disclaimer Information on the subcommittee process is also available on the NAS website under frequently asked questions.
EXIT disclaimer

Process for the Cost Review
EPA requested nominations for the National Drinking Water Advisory Council workgroup (read online). Arsenic cost workgroup membership and meetings summaries are available. A final workgroup meeting was held August 2-3 in Washington, DC. The entire NDWAC conferred on August 22 to discuss the report and what to transmit to EPA.

Process for the Benefits review

EPA's Science Advisory Board (SAB) requested nominations for the SAB Arsenic Benefits Review Panel (read online). The Federal Register notice for the July 19-20, 2001 meeting (read online) listed the charge and the meeting minutes are available at www.epa.gov/sab/01minute.htm.

Second Extension of the Effective Date
On April 23, 2001 EPA requested public comment on a proposal to delay the effective date [(read online) (PDF file)] for the rule until February 22, 2002. On May 22, 2001 EPA announced that it would delay the effective date [(read online) (PDF file)] for the rule until February 22, 2002 allowing time to complete the reassessment process outlined above and to afford the public a full opportunity to provide further input.

First Extension of Effective Date
In accordance with the January 20, 2001 memorandum from Andrew Card, Assistant to the President and Chief of Staff, entitled "Regulatory Review Plan," EXIT disclaimer EPA temporarily delayed the effective date for this rule for 60 days, from March 23, 2001 until May 22, 2001. The delay of effective date was published in the Federal Register on March 23, 2001 [(read online) (PDF file)].

EPA Adopts a Stricter Standard for Arsenic
On January 22, 2001 EPA adopted a new standard for arsenic in drinking water at 10 ppb.

- Fact sheet about the January 2001 arsenic rule (EPA 815-F-00-015)
- Technical fact sheet about the January 2001 arsenic rule (EPA 815-F-00-016)
- Quick Reference Guide (EPA 816-F-01-004) to the January 2001 rule
- Arsenic in drinking water rule (66 FR 6976 / January 22, 2001) (read online) ~ (PDF file)
- Detailed rule-making support documents for January 2001 rule:
  - Economic Analysis (871 Kb PDF file) (EPA 815-R-00-026 / December 2000)
  - Technologies and costs for removal of arsenic

from drinking water (652 Kb PDF file) (EPA 815-R-00-028 / December 2000)

- Analytical Methods Support Document for Arsenic in Drinking Water (170kb PDF) (EPA-815-R-00-010 / December 1999)
- Arsenic Occurrence in Public Drinking Water Supplies (1055 Kb PDF) (EPA-815-R-00-023 / December 2000) Appendices (5426 Kb PDF)

- Link to other information supporting the January 2001 final rule:

  - Arsenic in Drinking Water EXIT disclaimer
    National Academy of Sciences
    (March 2001)

Proposed Arsenic Rule
On June 22, 2000 EPA proposed a 5 ppb standard for arsenic. EPA requested comment on 3 ppb, 10 ppb and 20 ppb.

- Federal Register Notice (65 FR 38888 / June 22, 2000) (read online) ~ (PDF file) (EPA 815-Z-00-004)

  Proposal support documents

  - Technical Proposal fact sheet (May 2000) (EPA 815-F-00-011)
  - Regulatory Impact Analysis (June 2000) (PDF file)
  - Technologies & Costs for removal of arsenic in drinking water (April 1999) (PDF file)
  - Notice of Data Availability (65 FR 63027 / October 20, 2000) (PDF file)
  - Correction Notice (65 FR 64479 / October 27, 2000)
  - Arsenic Research Plan (PDF file)

You will need Adobe Acrobat Reader to view the Adobe PDF files on this page. See EPA's PDF page for more information about getting and using the free Acrobat Reader.

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Consumer Factsheet on: ASBESTOS

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Asbestos and how is it used?

Asbestos is a fibrous mineral occurring in natural deposits. Because asbestos fibers are resistant to heat and most chemicals, they have been mined for use in over 3,000 different products, including roofing materials, brake pads, and cement pipe often used in distributing water to communities.

Why is Asbestos being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for asbestos has been set at 7 million fibers per liter of water (M.L.) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 7 M.L. because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the health effects?

Short-term: Asbestos is not known to cause any health problems when people are exposed to it at levels above the MCL for relatively short periods of time.

Long-term: Asbestos has the potential to cause the following effects from a lifetime exposure at levels above the MCL: lung disease; cancer.

How much Asbestos is produced and released to the environment?

Asbestos fibers may be released from natural sources such as erosion of asbestos-containing ores, but the primary source is through the wear or breakdown of asbestos-containing materials, particularly from the wastewaters of mining and other industries, and by the use of asbestos cement pipes in water supply systems.

From 1987 to 1993, according to the Toxics Release Inventory, asbestos releases to water and land totaled nearly 9 million lbs. These releases were primarily from asbestos products industries which use asbestos in roofing materials, friction materials, and cement. The largest releases occurred in Pennsylvania and Louisiana.

What happens to Asbestos when it is released to the environment?

As a naturally occurring substance, asbestos can be present in surface and ground water. Small fibers may be carried long distances by water currents before settling. Asbestos fibers do not bind to soils, but nevertheless do NT migrate to ground water through soils. Asbestos is not expected to accumulate in aquatic life.

How will Asbestos be detected in and removed from my drinking water?

The regulation for asbestos became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples once and analyze them to find out if asbestos is present above 7 M.L.. If it is present above this level, the system must continue to monitor this contaminant once every 3 months.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of asbestos so that it is consistently below that level. The following treatment methods have been approved by EPA for removing asbestos: Coagulation/Filtration, Direct and Diatomite Filtration, Corrosion Control.

How will I know if Asbestos is in my drinking water?

If the levels of asbestos exceed the MCL, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing

alternative drinking water supplies, may be required to prevent serious risks to public health.

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

Drinking Water Standards:

MCLG: 7 M.L. (million fibers per liter)

MCL: 7 M.L.

Asbestos Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	**Land**
TOTALS	**32,650**	**8,620,439**

Top Five States*		
PA	0	2,945,049
LA	61	2,256,400
TX	0	1,737,200
AR	1,000	568,227
VA	0	480,000

Major Industries*		
Asbestos products	3,005	2,510,227
Alkalis, chlorine	1,973	2,256,404
Industrial organic chems	0	1,230,000
Asphalt felts, coatings	5	871,067
Auto parts	0	563,694
Petroleum refining	0	314,560
Plastic pipes	0	235,200
Shipbuilding, repairing	0	211,400

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

EPA strongly encourages people to learn more about their drinking water, and to support local efforts to protect and upgrade the supply of safe drinking water. Your water bill or telephone books government listings are a good starting point.

Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346.

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Consumer Factsheet on: BARIUM

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Barium and how is it used?

Barium is a lustrous, machinable metal which exists in nature only in ores containing mixtures of elements. It is used in making a wide variety of electronic components, in metal alloys, bleaches, dyes, fireworks, ceramics and glass. In particular, it is used in well drilling operations where it is directly released into the ground.

Why is Barium being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for barium has been set at 2 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 2 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the health effects?

Short-term: EPA has found barium to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: gastrointestinal disturbances and muscular weakness.

Long-term: Barium has the potential to cause the following effects from a lifetime exposure at levels above the MCL: high blood pressure.

How much Barium is produced and released to the environment?

The most common ores are found in AK, AR, CA, GA, KY, MO, NV, and TN. Barite was produced at 38 mines in these states in 1973, with Nevada supplying 50% of the tonnage. Barium is released to water and soil in the discharge and disposal of drilling wastes, from the smelting of copper, and the manufacture of motor vehicle parts and accessories.

From 1987 to 1993, according to the Toxics Release Inventory barium compound releases to land and water totaled over 57 million lbs. These releases were primarily from copper smelting industries. The largest releases occurred in Arizona and Utah. The largest direct releases to water occurred in Texas.

What happens to Barium when it is released to the environment?

In water, the more toxic soluble barium salts are likely to be converted to insoluble salts which precipitate. Barium does not bind to most soils and may migrate to ground water. It has a low tendency to accumulate in aquatic life.

How will Barium be detected in and removed from my drinking water?

The regulation for barium became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples once and analyze them to find out if barium is present above 2 ppm. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of barium so that it is consistently below that level. The following treatment methods have been approved by EPA for removing barium: Ion Exchange, Reverse Osmosis, Lime Softening, Electrodialysis.

How will I know if Barium is in my drinking water?

If the levels of barium exceed the MCL, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing

alternative drinking water supplies, may be required to prevent serious risks to public health.

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

Drinking Water Standards:

MCLG: 2 ppm

MCL: 2 ppm

Barium Releases to Water and Land: 1987 to 1993 (in pounds)

	Water	**Land**
TOTALS	**928,448**	**57,063,031**

Top Ten States *		
AZ	0	14,595,520
UT	1,500	13,423,164
VA	0	9,218,901
NM	0	5,233,790
IL	34,000	3,977,817
TN	0	2,586,906
AL	31,041	1,638,988
PA	15,582	1,216,362
TX	167,864	599,565
NJ	20,905	705,666

Major Industries*		
Copper smelting	1,500	31,958,310
Car parts, accessories	1,743	9,456,667
Industrial organics	132,511	4,106,827
Inorganic pigments	5,261	3,672,451

Gray, ductile iron	0	1,556,681
Steelworks, furnaces	256,582	679,999
Electrometallurgy	1,599	633,876
Paper mills	64,770	527,330

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

EPA strongly encourages people to learn more about their drinking water, and to support local efforts to protect and upgrade the supply of safe drinking water. Your water bill or telephone books government listings are a good starting point.

Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: BERYLLIUM

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Beryllium and how is it used?

Beryllium is a metal found in natural deposits as ores containing other elements, and in some precious stones such as emeralds and aquamarine. The greatest use of beryllium is in making metal alloys for nuclear reactors and the aerospace industry.

Why is Beryllium being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for beryllium has been set at 4 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 4 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are

met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the health effects?

Short-term: EPA has found barium to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: inflammation of the lungs when inhaled; less toxic in drinking water.

Long-term: Beryllium has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to bones and lungs; cancer.

How much Beryllium is produced and released to the environment?

Production of beryllium metal was 490,000 lbs. in 1986. It is released principally in the smoke stacks and ash wastes of power plants which burn coal. It is also found in discharges from other industrial and municipal operations. Rocket exhaust products also consist of various beryllium compounds.

From 1987 to 1993, according to the Toxics Release Inventory beryllium releases to land and water totaled over 340,000 lbs. These releases were primarily from copper rolling and drawing industries which use it as a hardener in alloys. The largest releases occurred in Pennsylvania and Ohio.

What happens to Beryllium when it is released to the environment?

Very little is known about what happens to beryllium compounds when released to the environment. It appears unlikely to leach to ground water when released to land. Erosion or runoff of beryllium compounds into surface waters is not likely to be in a soluble form.

How will Beryllium be detected in and removed from my drinking water?

The regulation for beryllium became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples once and analyze them to find out if beryllium is present above 4 ppb. If it is present above this level, the system must continue to monitor this contaminant every 3 months.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of beryllium so that it is consistently below that level. The following treatment methods have been approved by EPA for removing beryllium: Activated Alumina, Coagulation/filtration, Ion Exchange, Lime Softening, Reverse Osmosis.

How will I know if Beryllium is in my drinking water?

If the levels of beryllium exceed the MCL, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing

alternative drinking water supplies, may be required to prevent serious risks to public health.

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

Drinking Water Standards:

MCLG: 4 ppb

MCL: 4 ppb

Beryllium Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	**Land**
TOTALS	**1,314**	**341,721**

Top Five States		
PA	653	174,250
OH	490	166,292
MI	5	1,000
TX	0	174
MN	142	0

Major Industries		
Copper rolling, drawing	405	180,502
Nonferrous metal smelting	481	151,790
Nonferrous rolling, drawing	4	8,000
Aluminum foundries	5	1,000
Blast furnaces, steelworks	250	250
Petroleum refining	142	174

Learn more about your drinking water!

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Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346.

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Cadmium and how is it used?

Cadmium is a metal found in natural deposits as ores containing other elements. The greatest use of cadmium is primarily for metal plating and coating operations, including transportation equipment, machinery and baking enamels, photography, television phosphors. It is also used in nickel-cadmium and solar batteries and in pigments.

Why is Cadmium being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for cadmium has been set at 5 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 5 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant if it occurs in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the health effects?

Short-term: EPA has found cadmium to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: nausea, vomiting, diarrhea, muscle cramps, salivation, sensory disturbances, liver injury, convulsions, shock and renal failure.

Long-term: Cadmium has the potential to cause the following effects from a lifetime exposure at levels above the MCL: kidney, liver, bone and blood damage.

How much Cadmium is produced and released to the environment?

2.9 million lbs. of cadmium were produced in the US in 1986, and nearly twice that amount was imported in the same year. Cadmium occurs naturally in zinc, lead, copper and other ores which can serve as sources to ground and surface waters, especially when in contact with soft, acidic waters. Major industrial releases of cadmium are due to waste streams and leaching of landfills, and from a variety of operations that involve cadmium or zinc. In particular, cadmium can be released to drinking water from the corrosion of some galvanized plumbing and water main pipe materials.

From 1987 to 1993, according to EPAs Toxic Chemical Release Inventory, cadmium releases were primarily from zinc, lead and copper smelting and refining industries, with the largest releases occurring in Arizona and Utah.

What happens to Cadmium when it is released to the environment?

Some cadmium compounds are able to leach through soils to ground water. When cadmium compounds do bind to the sediments of rivers, they can be more easily bioaccumulated or re-dissolved when sediments are disturbed, such as during flooding. Its tendency to accumulate in aquatic life is great in some species, low in others.

How will Cadmium be detected in and removed from my drinking water?

The regulation for cadmium became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples once and analyze them to find out if cadmium is present above 5 ppb. If it is present above this level, the system must continue to monitor this contaminant every 3 months.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of cadmium so that it is consistently below that level. The following treatment methods have been approved by EPA for removing cadmium: Coagulation/Filtration, Ion Exchange, Lime Softening, Reverse

Osmosis.

How will I know if Cadmium is in my drinking water?

If the levels of cadmium exceed the MCL, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

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Drinking Water Standards:

MCLG: 5 ppb

MCL: 5 ppb

Cadmium Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	**Land**
TOTALS	**31,487**	**2,059,574**

Top Seven States *		
AZ	503	433,035
UT	1,750	372,010
MT	0	315,965
TN	2,700	288,781
ID	250	225,761
MO	2,361	189,914
WI	0	106,000

Major Industries*		
Zinc, lead smelting	5,061	831,948
Copper smelting, refining	2,253	805,045
Indust. inorganic chems	250	225,761

Electroplating, anodizing	0	106,000
Steelworks, blast furnaces	5	13,000
Inorganic pigments	5,140	7,000

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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Your state Department of Health/Environment is also a valuable source of information.

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Consumer Factsheet on: CHROMIUM

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Chromium and how is it used?

Chromium is a metal found in natural deposits as ores containing other elements. The greatest use of chromium is in metal alloys such as stainless steel; protective coatings on metal; magnetic tapes; and pigments for paints, cement, paper, rubber, composition floor covering and other materials. Its soluble forms are used in wood preservatives.

Why is Chromium being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for chromium has been set at 0.1 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 0.1 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the health effects?

Short-term: EPA has found chromium to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: skin irritation or ulceration.

Long-term: Chromium has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to liver, kidney circulatory and nerve tissues; skin irritation.

How much Chromium is produced and released to the Environment?

Production of the most water soluble forms of chromium, the chromate and dichromates, was in the range of 250,000 tons in 1992. Though chromium occurs in nature mostly as chrome iron ore and is widely found in soils and plants, it is rare in natural waters. The two largest sources of chromium emission in the atmosphere are from the chemical manufacturing industry and combustion of natural gas, oil, and coal.

From 1987 to 1993, according to the Toxics Release Inventory, chromium compound releases to land and water totaled nearly 200 million pounds. These releases were primarily from industrial organic chemical industries. The largest releases occurred in Texas and North Carolina. The largest direct releases to water occurred in Georgia and Pennsylvania.

What happens to Chromium when it is released to the environment?

When released to land, chromium compounds bind to soil are not likely to migrate to ground water. They are very persistent in water as sediments. There is a high potential for accumulation of chromium in aquatic life.

How will Chromium be detected in and removed from my drinking water?

The regulation for chromium became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples once and analyze them to find out if chromium is present above 0.1 ppm. If it is present above this level, the system must continue to monitor this contaminant every 3 months.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of chromium so that it is consistently below that level. The following treatment methods have been approved by EPA for removing chromium: Coagulation/Filtration, Ion Exchange, Reverse Osmosis, Lime Softening.

How will I know if Chromium is in my drinking water?

If the levels of chromium exceed the MCL, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

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private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

Drinking Water Standards:

MCLG: 0.1 ppm

MCL: 0.1 ppm

Chromium Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS	**2,876,055**	**196,880,624**

Top Ten States *		
TX	102,079	64,301,920
NC	43,522	55,217,044
IN	85,570	15,955,895
OH	51,830	8,319,600
UT	1,750	5,817,015
AR	2,300	3,532,000
KY	255	2,491,519
PA	110,149	2,337,905
GA	679,721	1,404,698
ID	91,750	1,404,870

Major Industries*		
Indust. organics	3,272	120,707,814

Steelworks, Blast furn.	609,174	16,638,880
Electrometallurgy	33,269	10,796,928
Copper smelting, refining	1,750	5,817,015
Nonferrous smelting	2,300	3,532,000
Inorganic pigments	88,721	1,375,700
Pulp mills	985,800	224,198

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Copper and how is it used?

Copper is a metal found in natural deposits as ores containing other elements. It is widely used in household plumbing materials.

Why is Copper being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for copper has been set at 1.3 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Since copper contamination generally occurs from corrosion of household copper pipes, it cannot be directly detected or removed by the water system. Instead, EPA is requiring water systems to control the corrosiveness of their water if the level of copper at home taps exceeds an Action Level.

The Action Level for copper has also been set at 1.3 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to control this contaminant should it occur in drinking water at their customers home taps.

These drinking water standards and the regulations for ensuring these standards are

met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the health effects?

Short- and long-term effects: Copper is an essential nutrient, required by the body in very small amounts. However, EPA has found copper to potentially cause the following health effects when people are exposed to it at levels above the Action Level. Short periods of exposure can cause gastrointestinal disturbance, including nausea and vomiting. Use of water that exceeds the Action Level over many years could cause liver or kidney damage. People with Wilsons disease may be more sensitive than others to the effect of copper contamination and should consult their health care provide

How much Copper is produced and released to the environment?

Copper may occur in drinking water either by contamination of the source water used by the water system, or by corrosion of copper plumbing. Corrosion of plumbing is by far the greatest cause for concern. Copper is rarely found in source water, but copper mining and smelting operations and municipal incineration may be sources of contamination.

From 1987 to 1993, according to the Toxics Release Inventory copper compound releases to land and water totaled nearly 450 million lbs., of which nearly all was to land. These releases were primarily from copper smelting industries. The largest releases occurred in Utah. The largest direct releases to water occurred in Tennessee.

What happens to Copper when it is released to the environment?

All water is corrosive toward copper to some degree, even water termed noncorrosive or water treated to make it less corrosive. Corrosivity toward copper is greatest in very acidic water. Many of the other factors that affect the corrosivity of water toward lead can also be expected to affect the corrosion of copper.

How will Copper be detected in and removed from my drinking water?

The regulation for copper became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples from household taps twice a year and analyze them to find out if copper is present above 1.3 ppm in more than 10 percent of all homes tested. If it is present above this level, the system must continue to monitor this contaminant twice a year.

If contaminant levels are found to be consistently above the Action level, your water supplier must take steps to reduce the amount of copper so that it is consistently below that level. The following treatment methods have been approved by EPA for controlling copper: Corrosion control.

How will I know if Copper is in my drinking water?

If the water system fails to comply with any EPA or state treatment requirements, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

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Drinking Water Standards:

MCLG: 1.3 ppm

Action level: 1.3 ppm

Copper Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS	**1,538,148**	**442,082,245**

Top Ten States *		
UT	55,350	153,501,500
NM	0	130,682,387
AZ	2,636	104,619,532
MI	19,763	11,172,897
NY	66,57	10,017,766
MT	0	8,696,153
TN	301,417	1,208,804
MO	250	1,486,000
AL	41,213	513,536
MD	78,601	270,945

Major Industries*		
Primary copper smelting	7,591	201,214,264
Other nonferrous smelt.	4,414	11,317,048

Plastic materials	44,422	9,637,850
Blast furnaces, steel	156,982	3,229,752
Poultry slaughtering	0	1,249,750
Copper rolling, drawing	17,253	941,075
Ind. organic chems	28,936	827,356
Prepared feeds, misc.	1,038	760,094
Ind. inorganic chems	220,503	527,458

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

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Consumer Factsheet on: CYANIDE

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What is Cyanide and how is it used?

Cyanide is a carbon-nitrogen chemical unit which combines with many organic and inorganic compounds. The most commonly used form, hydrogen cyanide, is mainly used to make the compounds needed to make nylon and other synthetic fibers and resins. Other cyanides are used as herbicides.

Why is Cyanide being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for cyanide has been set at 0.2 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies

The MCL has been set at 0.2 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water. These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide y these regulations

What are the health effects?

Short-term: EPA has found cyanide to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: rapid breathing, tremors and other neurological effects

Long-term: Cyanide has the potential to cause the following effects from a lifetime exposure at levels above the MCL: weight loss, thyroid effects, nerve damage

How much Cyanide is produced and released to the environment?

Production of the most common cyanides was roughly 5 billion pounds a year in the late 1980s and early 1990s. The major cyanide releases to water are discharges from metal finishing industries, iron and steel mills, and organic chemical industries. Releases to soil appear to be primarily from disposal of cyanide wastes in landfills and the use of cyanide-containing road salts. Chlorination treatment of some wastewaters can produce cyanides as a by-product

From 1987 to 1993, according to the Toxics Release Inventory cyanide compound releases to land and water totaled about 1.5 million lbs. These releases were primarily from steel mills and metal heat treating industries. The largest releases occurred in California and Pennsylvania

What happens to Cyanide when it is released to the environment?

Cyanides are generally not persistent when released to water or soil, and are not likely to accumulate in aquatic life. They rapidly evaporate and are broken down by microbes. They do not bind to soils and may leach to ground water.

How will Cyanide be detected in and removed from my drinking water?

The regulation for cyanide became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples once and analyze them to find out if cyanide is present above 0.2 ppm. If it is present above this level, the system must continue to monitor this contaminant every 3 months.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of cyanide so that it is consistently below that level. The following treatment methods have been approved by EPA for removing cyanide: Ion Exchange, Reverse Osmosis, Chlorine

How will I know if Cyanide is in my drinking water?

If the levels of cyanide exceed the MCL, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA)

Drinking Water Standards:

MCLG: 0.2 ppm

MCL: 0.2 ppm

Cyanide Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	**Land**
TOTALS	**939,611**	**641,082**

Top Ten States		
CA	0	430,886
PA	208,239	4,909
IN	187,377	20,242
OH	160,203	850
TX	54,379	83,394
MD	89,438	23,503

Major Industries		
Blast furnaces + steel	747,970	53,404
Metal heat treating	0	430,886
Ind organic chems	49,098	82,912
Plating + polishing	29,486	29,636

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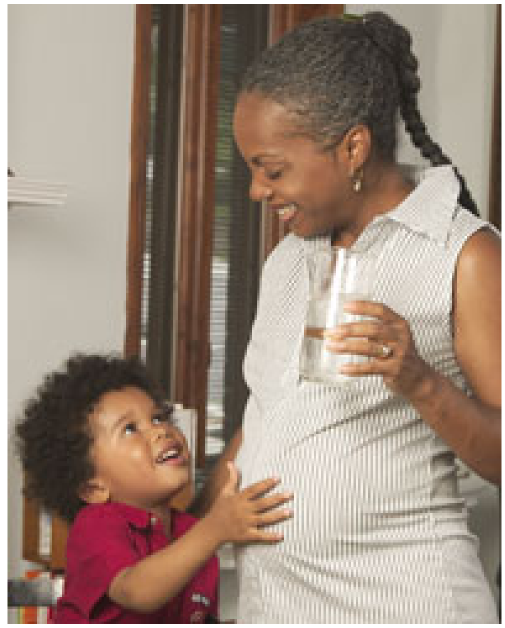

Lead, a metal found in natural deposits, is commonly used in household plumbing materials and water service lines. The greatest exposure to lead is swallowing or breathing in lead paint chips and dust.

But lead in drinking water can also cause a variety of adverse health effects. In babies and children, exposure to lead in drinking water above the action level can result in delays in physical and mental development, along with slight deficits in attention span and learning abilities. In adults, it can cause increases in blood pressure. Adults who drink this water over many years could develop kidney problems or high blood pressure.

Lead is rarely found in source water, but enters tap water through corrosion of plumbing materials. Very old and poorly maintained homes may be more likely to have lead pipes, joints, and solder. However, new homes are also at risk: even legally lead-free pipes may contain up to 8 percent lead. These pipes can leave significant amounts of lead in the water for the first several months after their installation.

For more information on lead contamination, see the following links in our sidebar or the links listed below:

Fact Sheets:

- **Actions You Can Take To Reduce Lead In Drinking Water**
  - English (EPA 810-F-93-001 June 1993)
  - En Español (EPA 815-K-00-001mayo de 2000)
- Lead In Drinking Water Page

- Consumer Fact Sheet

Local Lead Information:

- Lead in Drinking Water Notice for District of Columbia Residents
- Where You Live

Regulatory Information:

- Lead's Action Level
- Regulatory Information
  - NEW National Primary Drinking Water Regulations: Minor Corrections and Clarification to Drinking Water Regulations; National Primary Drinking Water Regulations for Lead and Copper

CONSUMER INFORMATION
(800) 424-LEAD

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TECHNICAL INFORMATION
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Consumer Factsheet on: MERCURY

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This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Mercury and how is it used?

Mercury is a liquid metal found in natural deposits as ores containing other elements. Electrical products such as dry-cell batteries, fluorescent light bulbs, switches, and other control equipment account for 50% of mercury used.

Why is Mercury being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for mercury has been set at 2 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 2 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are

met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the health effects?

Short- or Long-term: EPA has found mercury to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: kidney damage.

How much Mercury is produced and released to the environment?

Large amounts of mercury are released naturally from the earths crust. Combustion of fossil fuels, metal smelters, cement manufacture, municipal landfills, sewage, metal refining operations, r most notably, from chloralkali plants are important sources of mercury release. Nearly 8 million lbs. of mercury were produced in the U.S. in 1986.

From 1987 to 1993, according to EPAs Toxic Chemical Release Inventory, mercury releases to land and water totaled nearly 68,000 lbs. These releases were primarily from chemical and allied industries. The largest releases occurred in Tennessee and Louisiana. The largest direct releases to water occurred in West Virginia and Alabama.

What happens to Mercury when it is released to the environment?

Mercury is unique among metals in that it can evaporate when released to water or soil. Also, microbes can convert inorganic forms of mercury to organic forms which can be accumulated by aquatic life.

How will Mercury be detected in and removed from my drinking water?

The regulation for mercury became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples once and analyze them to find out if mercury is present above 2 ppb. If it is present above this level, the system must continue to monitor this contaminant every 3 months.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of mercury so that it is consistently below that level. The following treatment methods have been approved by EPA for removing mercury: Coagulation/Filtration; Granular Activated Carbon; Lime softening; Reverse osmosis.

How will I know if Mercury is in my drinking water?

If the levels of mercury exceed the MCL, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

Drinking Water Standards:

MCLG: 2 ppb

MCL: 2 ppb

Mercury Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	**Land**
TOTALS	**6,971**	**60,877**

Top Six States		
TN	164	29,161
LA	431	21,829
DE	117	3,860
OH	29	2,760
AL	1,462	4,001
WV	1,657	454

Major Industries*		
Chemical, allied products	12,269	74,720
Electric lamps	0	2,750
Paper mills	2,500	0

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Consumer Factsheet on: NITRATES/NITRITES

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What are Nitrates/Nitrites and how are they used?

Nitrates and nitrites are nitrogen-oxygen chemical units which combines with various organic and inorganic compounds. Once taken into the body, nitrates are converted into nitrites. The greatest use of nitrates is as a fertilizer.

Why are Nitrates/Nitrites being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for nitrates has been set at 10 parts per million (ppm), and for nitrites at 1 ppm, because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL for nitrates has been set at 10 ppm, and for nitrites at 1 ppm, because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the health effects?

Short-term: Excessive levels of nitrate in drinking water have caused serious illness and sometimes death. The serious illness in infants is due to the conversion of nitrate to nitrite by the body, which can interfere with the oxygen-carrying capacity of the childs blood. This can be an acute condition in which health deteriorates rapidly over a period of days. Symptoms include shortness of breath and blueness of the skin.

Long-term: Nitrates and nitrites have the potential to cause the following effects from a lifetime exposure at levels above the MCL: diuresis, increased starchy deposits and hemorrhaging of the spleen.

How much Nitrates/Nitrites are produced and released to the environment?

Most nitrogenous materials in natural waters tend to be converted to nitrate, so all sources of combined nitrogen, particularly organic nitrogen and ammonia, should be considered as potential nitrate sources. Primary sources of organic nitrates include human sewage and livestock manure, especially from feedlots.

The primary inorganic nitrates which may contaminate drinking water are potassium nitrate and ammonium nitrate both of which are widely used as fertilizers.

According to the Toxics Release Inventory, releases to water and land totaled over 112 million pounds from 1991 through 1993. The largest releases of inorganic nitrates occurred in Georgia and California.

What happens to Nitrates/Nitrites when they are released to the environment?

Since they are very soluble and do not bind to soils, nitrates have a high potential to migrate to ground water. Because they do not evaporate, nitrates/nitrites are likely to remain in water until consumed by plants or other organisms.

How will Nitrates/Nitrites be detected in and removed from my drinking water?

The regulation for nitrates/nitrites became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples at least once a year and analyze tem to find out if nitrates/nitrites are present above 50 percent of their MCLs. If it is present above this level, the system must continue to monitor this contaminant every 3 months.

If contaminant levels are found to be consistently above their MCLs, your water supplier must take steps to reduce the amount of nitrates/nitrites so that they are consistently below that level. The following treatment methods have been approved by EPA for removing nitrates/nitrites: Ion exchange, Reverse Osmosis, Electrodialysis.

How will I know if Nitrates/Nitrites are in my drinking water?

If the levels of nitrates/nitrites exceed their MCLs, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards (ppm): MCLG MCL

Nitrate:	**10**	**10**
Nitrite:	**1**	**1**

Nitrate and Nitrite Releases to Water and Land: 1991 to 1993 (in pounds)

	Water	**Land**
TOTALS	**59,014,378**	**53,134,805**

Top Fifteen States*		
GA	12,114,253	12,028,585
CA	0	21,840,999
AL	3,463,097	6,014,674
LA	8,778,237	2,250
MO	6,985,890	206,181
MS	6,952,387	0
KS	5,140,000	877,095
VA	5,091,764 0	
NV	0	4,977,482
FL	1,056,560	1,835,736
AR	1,206,610	1,058,294
MD	1,802,219	138,819
IA	1,500,340	132,042
OK	1,436,348	14,199
UT	0	1,045,400

Major Industries*		
Nitrogenous fertilizer	41,584,611	8,607,376
Misc. Ind. inorganics	4,113,312	29,676,919
Misc. Metal ores	0	5,764,976
Misc. Ind. organics	5,091,764	0
Fertilizer mixing	480,000	4,554,916
Explosives	850,921	1,297,590
Paper mills	1,727,061	0
Pulp mills	1,321,500	3,350
Canned foods	0	1,056,794
Phosphate fertilizers	1,000,000	0

* State/Industry totals only include facilities with releases greater than 10,000 lbs.

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Consumer Factsheet on: SELENIUM

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Selenium and how is it used?

Selenium is a metal found in natural deposits as ores containing other elements. The greatest use of selenium compounds is in electronic and photocopier components, but they are also widely used in glass, pigments, rubber, metal alloys, textiles, petroleum, medical therapeutic agents, and photographic emulsions.

Why is Selenium being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for selenium has been set at 0.05 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.05 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the health effects?

Short-term: Selenium is an essential nutrient at low levels. However, EPA has found selenium to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: hair and fingernail changes; damage to the peripheral nervous system; fatigue and irritability.

Long-term: Selenium has the potential to cause the following effects from a lifetime exposure at levels above the MCL: hair and fingernail loss; damage to kidney and liver tissue, and the nervous and circulatory systems.

How much Selenium is produced and released to the environment?

Production in 1985 was reported to be 429,515 pounds. Selenium compounds are released to the air during the combustion of coal and petroleum fuels, and during the smelting and refining of other metals.

From 1987 to 1993, according to the Toxics Release Inventory selenium releases to land and water totaled over 1 million lbs. These releases were primarily from copper smelting industries. The largest releases occurred in Utah. The largest direct releases to water occurred in Indiana.

What happens to Selenium when it is released to the environment?

The toxicity of selenium depends on whether it is in the biologically active oxidized form, which occurs in alkaline soils. These conditions can cause plant uptake of the metal to be increased. It is known that selenium accumulates in living tissues.

How will Selenium be detected in and removed from my drinking water?

The regulation for selenium became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples once and analyze them to find out if selenium is present above 0.05 ppm. If it is present above this level, the system must continue to monitor this contaminant every 3 months.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of selenium so that it is consistently below that level. The following treatment methods have been approved by EPA for removing selenium: Activated Alumina, Coagulation/Filtration, Lime Softening, Reverse Osmosis.

How will I know if Selenium is in my drinking water?

If the levels of selenium exceed the MCL, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

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Drinking Water Standards:

MCLG: 0.05 ppm

MCL: 0.05 ppm

Selenium Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	**Land**
TOTALS	**13,556**	**1,010,686**

Top Five States*		
UT	1,578	696,515
AZ	0	260,632
WI	0	45,000
IN	5,300	0
TX	359	4,920

Major Industries*		
Copper smelting, refining	1,500	962,067
Metal coatings	0	45,000
Petroleum refining	8,949	977

* Land totals only include facilities with releases greater than 1000 lbs.

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What is Thallium and how is it used?

Thallium is a metal found in natural deposits as ores containing other elements. The greatest use of thallium is in specialized electronic research equipment.

Why is Thallium being regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for thallium has been set at 0.5 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 2 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the health effects?

Short-term: EPA has found thallium to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: gastrointestinal irritation; nerve damage.

Long-term: Thallium has the potential to cause the following effects from a lifetime exposure at levels above the MCL: changes in blood chemistry; damage to liver, kidney, intestinal and testicular tissues; hair loss.

How much Thallium is produced and released to the environment?

Thallium is not produced in the US. Approximately 4,500 lbs. of thallium and its compounds were reportedly imported in 1987. Man-made sources of thallium pollution are gaseous emission of cement factories, coal burning power plants, and metal sewers. The leaching of thallium from ore processing operations is the major source of elevated thallium concentrations in water. Thallium is a trace metal associated with copper, gold, zinc, and cadmium.

What happens to Thallium when it is released to the environment?

Thallium does not long persist if released to water, but does have a strong tendency to accumulate in aquatic life. If released to land, it may bind to alkaline soils, but may otherwise migrate to ground water.

How will Thallium be detected in and removed from my drinking water?

The regulation for thallium became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples once and analyze them to find out if thallium is present above 2 ppb. If it is present above this level, the system must continue to monitor this contaminant every 3 months.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of thallium so that it is consistently below that level. The following treatment methods have been approved by EPA for removing thallium: Activated alumina; Ion Exchange.

How will I know if Thallium is in my drinking water?

If the levels of thallium exceed the MCL, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

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Drinking Water Standards:

MCLG: 0.5 ppb

MCL: 2 ppb

Thallium Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS	**2,606**	**2,770**

Top Five States		
TX	6	2,020
OH	1,500	0
MN	1,100	0
CO	0	500
IN	0	250

Major Industries*		
Primary copper smelting	1,856	765
Petroleum refining	750	1,255
Primary nonferrous metals	0	500
Blast furnaces, steelworks	0	250

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Consumer Factsheet on: ACRYLAMIDE

List of Contaminants

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What is Acrylamide and how is it used?

Acrylamide is an organic solid of white, odorless, flake-like crystals. The greatest use of acrylamide is as a coagulant aid in drinking water treatment. Other uses of include: to improve production from oil wells; in making organic chemicals and dyes; in the sizing of paper and textiles; in ore processing; in the construction of dam foundations and tunnels.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

2-Propenamide
Acrylic amide
Ethylenecarboxamide
Amresco Acryl-40
Acrylagel
Optimum

Why is Acrylamide being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for acrylamide has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

There are currently no acceptable means of detecting acrylamide in drinking water. In this case, EPA is requiring water suppliers to use a special treatment technique to control its amount in water. Since acrylamide is used in drinking water treatment processes, it is being controlled simply by limiting its use for this purpose.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found acrylamide to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: damage to the nervous system, weakness and incoordination in the legs.

Long-term: Acrylamide has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to the nervous system, paralysis; cancer.

How much Acrylamide is produced and released to the environment?

Demand for acrylamide in the early 1990s was about 120 million pounds. The main source of concern for acrylamide in drinking water is from its use as a clarifier during water treatment. When added to water, it coagulates and traps suspended solids for easier removal. However, some acrylamide does not coagulate and remains in the water as a contaminant. Improvements in the production and use of acrylamide have made it possible to control this contamination to acceptable levels.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, acrylamide releases to land and water totalled over 40,000 lbs. These releases were primarily from plastics industries. The largest releases occurred in Michigan.

What happens to Acrylamide when it is released to the environment?

Acrylamide does not bind to soil and will move into soil rapidly, but it is degraded by microbes within a few days in soil and water. Its has little tendency to accumulate in fish.

How will Acrylamide be Detected in and Removed from My Drinking Water?

The regulation for acrylamide became effective in 1992. EPA requires your water supplier to show that when acrylamide is added to water, the amount of uncoagulated acrylamide is less than 0.5 ppb.

How will I know if Acrylamide is in my drinking water?

If the treatment technique for acrylamide fails, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: Treatment Technique

Acrylamide Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**36,287**	**5,818**
Top Five States*		
MI	12,200	0
WA	8,000	0
CT	5,690	0
LA	4,367	500
PA	2,505	20
AL	1,262	1,258
Major Industries*		
Plastics and resins	19,002	2,177
Pulp mills	8,000	0
Indust. organics	3,107	2,200
Indust. inorganics	2,510	500

* Water/Land totals only include facilities with releases greater 100 lbs.

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Consumer Factsheet on: ALACHLOR

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What is Alachlor and how is it used?

Alachlor is an odorless, white solid. The greatest use of alachlor is as a herbicide for control of annual grasses and broadleaf weeds in crops, primarily on corn, sorghum and soybeans. Alachlor is the second most widely used herbicide in the United States, with particularly heavy use on corn and soybeans in Illinois, Indiana, Iowa, Minnesota, Nebraska, Ohio, and Wisconsin.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Alochlor
Lasagrin
Lassagrin
Lasso
Lazo;
Metachlor
Pillarzo
Alanox
Alanex
Chimichlor

Why is Alachlor being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for alachlor has been set at zero because EPA believes this level of protection would not cause any of the long-term effects described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 2 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found alachlor to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: slight skin and eye irritation.

Long-term: Alachlor has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to liver, kidney, spleen; lining of nose and eyelids; cancer.

How much Alachlor is produced and released to the environment?

The major source of environmental release of alachlor is through its manufacture and use as a herbicide. Alachlor was detected in rural domestic well water by EPA's National Survey of Pesticides in Drinking Water Wells. EPA's Pesticides in Ground Water Database reports detections of alachlor in ground water at concentrations above the MCL in at least 15 States.

What happens to Alachlor when it is released to the environment?

If released to soil, alachlor can be broken down by bacteria and sunlight, usually within two months. However, alachor does not bind to most soils very well and may either evaporate or leach into ground water.

Sunlight and bacterial action are also important for degrading alachlor in surface water, but evaporation generally does not occur. Once alachlor enters ground water, its break down is very slow.

The bioconcentration of alachlor in aquatic organisms is not important. Any alachlor taken up by plants or animals is quickly eliminated.

How will Alachlor be Detected in and Removed from My Drinking Water?

The regulation for alachlor became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if alachlor is present above 0.2 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of alachlor so that it is consistently below that level. The following treatment methods have been approved by EPA for removing alachlor: Granular activated charcoal.

How will I know if Alachlor is in my drinking water?

If the levels exceed the MCL, 2 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 2 ppb

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Consumer Factsheet on: ATRAZINE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Atrazine and how is it used?

Atrazine is a white, crystalline solid organic compound. It is a widely used herbicide for control of broadleaf and grassy weeds. Atrazine was estimated to be the most heavily used herbicide in the United States in 1987/89, with its most extensive use for corn and soybeans in Illinois, Indiana, Iowa, Kansas, Missouri, Nebraska, Ohio, Texas, and Wisconsin. Effective in 1993, its uses were greatly restricted.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Aatrex
Actinite PK
Akticon
Argezin
Atazinax
Atranex
Atrataf
Atred
Candex
Cekuzina-T

Chromozin
Crisatrina
Cyazin
Fenamin
Fenatrol
Gesaprim
Griffex
Hungazin
Inakor
Pitezin
Primatol
Radazin
Strazine
Vectal
Weedex A
Wonuk
Zeapos
Zeazine

Why is Atrazine being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for atrazine has been set at 3 parts per billion (ppb) because EPA believes this level of protection would not cause any of the health effects described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 3 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found atrazine to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: congestion of heart, lungs and kidneys; low blood pressure; muscle spasms; weight loss; damage to adrenal glands.

Long-term: Atrazine has the potential to cause the following effects from a lifetime exposure at levels above the MCL: weight loss, cardiovascular damage, retinal and some muscle degeneration; cancer.

How much Atrazine is produced and released to the environment?

Atrazine may be released to the environment in wastewater from manufacturing facilities and through its use as a herbicide. Atrazine was the second most frequently detected pesticide in EPA's National Survey of Pesticides in Drinking Water Wells. EPA's Pesticides in Ground Water Database indicates numerous detections of atrazine at concentrations above the MCL in ground water in several States, including Delaware, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska and New York.

What happens to Atrazine when it is released to the environment?

Microbial activity and other chemicals may breakdown atrazine in soil and water, particularly in alkaline conditions. Sunlight and evaporation do not reduce its presence. It may bind to some soils, but generally tends to leach to ground water.

Atrazine is not likely to be taken up in the tissues of plants or animals.

How will Atrazine be Detected in and Removed from My Drinking Water?

The regulation for atrazine became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if atrazine is present above 1 ppb. If it is present above this level the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of atrazine so that it is consistently below that level. The following treatment methods have been approved by EPA for removing atrazine: Granular activated charcoal.

How will I know if Atrazine is in my drinking water?

If the levels of atrazine exceed the MCL, 3 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 3 ppb

Mcl: 3 ppb

Learn more about your drinking water!

EPA strongly encourages people to learn more about their drinking water, and to support local efforts to protect and upgrade the supply of safe drinking water. Your water bill or telephone book's government listings are a good starting point.

Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPA's Safe Drinking Water Hotline: (800) 426-4791.

For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346

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Consumer Factsheet on: BENZENE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Benzene and how is it used?

Benzene is a clear, colorless aromatic liquid. It is highly flammable. The greatest use of benzene is as a building block for making plastics, rubber, resins and synthetic fabrics like nylon and polyester. Other uses include: as a solvent in printing, paints, dry cleaning, etc.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Benzol 90
Pyrobenzol
Polystream
Coal naphtha
Phene

Why is Benzene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for benzene has been set at zero because EPA believes this level of protection would not cause any of the health effects described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum

Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 5 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All community water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found benzene to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: temporary nervous system disorders, immune system depression, anemia.

Long-term: Benzene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: chromosome aberrations, cancer.

How much Benzene is produced and released to the environment?

Production of benzene has increased: from about 9.9 billion lbs. in 1984 to over 12 billion lbs. in 1993.

Benzene is released to air primarily from fumes and exhaust connected with its use in gasoline. Other sources are fumes from its production and use in manufacturing other chemicals. In addition, there are discharges into water from industrial effluents and losses during spills.

From 1987 to 1992, according to the Toxics Release Inventory, releases of benzene to water and land totalled over 2 million lbs. These releases were primarily from petroleum refining industries, with the greatest releases occurring in Texas.

What happens to Benzene when it is released to the environment?

If benzene is released to soil, it will either evaporate very quickly or leach to groundwater. It can be broken down by some soil microbes. It may also be degraded in some ground waters. If benzene is released to surface water, most of it should evaporate within a few hours. Though it does not degrade by reacting with water, it may be degraded by microbes. It is not likely to accumulate in aquatic organisms.

How will Benzene be Detected in and Removed from My Drinking Water?

The regulation for benzene became effective in 1989. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if benzene is present above 0.5 ppb. If it is present above this level, the system must continue to monitor the benzene levels.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of benzene so that it is consistently below that level. The following treatment methods have been approved by EPA for removing benzene: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if Benzene is in my drinking water?

If the levels of benzene exceed the MCL, 5 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 5 ppb

Benzene Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTAL	**564,546**	**1,539,385**
Top Six States*		
TX	1,436	1,135,994
AL	199,642	0
LA	137,599	4,347
CO	0	40,793
NM	0	38,199
IL	3	34,110
Major Industries*		
Petroleum refining	32,411	1,049,800
Primary Metal Ind.	133,339	18,078
Industrial chemicals	73,000	250,103
Alkalies, chlorine	122,240	0

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: BENZO(A)PYRENE

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National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Benzo(a)pyrene and how is it used?

Benzo(a)pyrene, or BaP, is one of a group of compounds called polycyclic aromatic hydrocarbons (PAHs). They are not produced or used commercially but are very commonly found since they are formed as a result of incomplete combustion of organic materials.

Trade Names and Synonyms:

BaP
3,4-Benz(a)pyrene

Why is Benzo(a)pyrene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinkingwater which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for benzo(a)pyrene has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a

Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.2 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found benzo(a)pyrene to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: red blood cell damage, leading to anemia; suppressed immune system.

Long-term: Benzo(a)pyrene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: developmental and reproductive effects; cancer.

How much Benzo(a)pyrene is produced and released to the environment?

PAHs are found in exhaust from motor vehicles and other gasoline and diesel engines, emission from coal-, oil-, and wood-burning stoves and furnaces, cigarette smoke; general soot and smoke of industrial, municipal, and domestic origin, and cooked foods, especially charcoal-broiled; in incinerators, coke ovens, and asphalt processing and use.

There are two major sources of PAHs in drinking water: 1) contamination of raw water supplies from natural and man-made sources, and 2) leachate from coal tar and asphalt linings in water storage tanks and distribution lines. PAHs in raw water will tend to adsorb to any particulate matter and be removed by filtration before reaching the tap.

PAHs in tap water will mainly be due to the presence of PAH-containing materials in water storage and distribution systems.

Though few data are available for estimating the potential for PAH release to water from these materials, there are reports that levels can reach 0.01 mg/L with optimum leaching conditions.

What happens to Benzo(a)pyrene when it is released to the environment?

Released benzo(a)pyrene is moderately persistent in the environment. It readily binds to soils and should not leach to ground water, though it has been detected in some ground water. If released to water, it will adsorb very strongly to sediments and particulate matter. In most waters and in sediments it will resist breakdown by microbes or reactive chemicals, but it may evaporate or be degraded by sunlight. Benzo(a)pyrene is expected to bioconcentrate in aquatic organisms that can not metabolize it, including plankton, oysters and some fish.

How will Benzo(a)pyrene be Detected in and Removed from My Drinking Water?

The regulation for BaP became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if BaP is present above 0.02 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of BaP so that it is consistently below that level. The following treatment methods have been approved by EPA for removing BaP: Granular activated charcoal.

How will I know if Benzo(a)pyrene is in my drinking water?

If the levels of BaP exceed the MCL, 0.2 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 0.2 ppb

Learn more about your drinking water!

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Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPA's Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: CARBOFURAN

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This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Carbofuran and how is it used?

Carbofuran is a white crystalline solid with a slightly phenolic odor. This broad spectrum insecticide is sprayed directly onto soil and plants just after emergence to control beetles, nematodes and rootworm. The greatest use of carbofuran is on alfalfa and rice, with turf and grapes making up most of the remainder. Earlier uses were primarily on corn crops.

Carbofuran is allowed for use on only a few U.S. crops, and will soon be banned from use on corn and sorghum in California.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Niagara 10242
Furadan 4F or 3G
Brifur
Crisfuran
Chinufur
Curaterr
Yaltox
Pillarfuran

Kenofuran
Carbofuran

Why is Carbofuran being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for carbofuran has been set at 40 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 40 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found carbofuran to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: headache, sweating, nausea, diarrhea, chest pains, blurred vision, anxiety and general muscular weakness. These effects are reversible.

Long-term: Carbofuran has the potential to cause the following health effects from long-term exposures at levels above the MCL: damage to the nervous and reproductive systems.

How much Carbofuran is produced and released to the environment?

Carbofuran enters surface water as a result of runoff from treated fields and enters ground water by leaching of treated crops.

EPA's 1990 National Pesticide Survey did not detect carbofuran levels above the MCL in rural domestic wells or Community Water

System wells. EPA's Pesticides in Ground Water Database found very low levels of carbofuran in ground water between 1971 and 1991.

What happens to Carbofuran when it is released to the environment?

If released to soil or water, carbofuran will be broken down by reactive chemicals and microbes, particularly in alkaline conditions. Carbofuran may leach significantly in many soils, as has been seen in the detection of carbofuran in sandy aquifers in NY and WI. Leaching may not occur, however, in very high organic content soils. It is not expected to accumulate in aquatic organisms.

How will Carbofuran be Detected in and Removed from My Drinking Water?

The regulation for carbofuran became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if carbofuran is present above 0.9 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of carbofuran so that it is consistently below that level. The following treatment methods have been approved by EPA for removing carbofuran: Granular activated charcoal.

How will I know if Carbofuran is in my drinking water?

If the levels of carbofuran exceed the MCL, 40 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 40 ppb

Mcl: 40 ppb

Learn more about your drinking water!

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Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPA's Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: CARBON TETRACHLORIDE

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This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Carbon Tetrachloride and how is it used?

Carbon tetrachloride is a clear heavy organic liquid with a sweet aromatic odor similar to chloroform. Most of it is used to make chlorofluorocarbon propellants and refrigerants, though this has been declining steadily. Other uses have included: as dry cleaning agent and fire extinguisher, in making nylon, as a solvent for rubber cement, soaps, insecticides, etc.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Perchloromethane
Methane tetrachloride
Benzinoform
Univerm
Necatorina
Facsiolin
Flukoids
R10 (refrigerant)
Tetraform
Tetrasol
Freon 10
Halon 104

Why is Carbon Tetrachloride being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for carbon tetrachloride has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 5 part per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found carbon tetrachloride to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: liver, kidney and lung damage.

Long-term: Carbon tetrachloride has the potential to cause the following effects from a lifetime exposure at levels above the MCL: liver damage; cancer.

How much Carbon Tetrachloride is produced and released to the environment?

Production of carbon tetrachloride in 1988 was 761 million lbs Carbon tetrachloride is released to land and water from landfills, in wastewater from industries, from agricultural activities. From 1987 to 1993, according to the Toxic Release Inventory, carbon tetrachloride releases to water and land totalled nearly 76,000 lbs. These releases were primarily from chemical manufacturing industries. The largest releases occurred in Texas.

What happens to Carbon Tetrachloride when it is released to the environment?

Carbon tetrachloride evaporates quickly from surface waters and soil. It does not bind to soil and may leach into ground water. It has a low potential to accumulate in aquatic life.

How will Carbon Tetrachloride be Detected in and Removed from My Drinking Water?

The regulation for carbon tetrachloride became effective in 1989. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if carbon tetrachloride is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water

supplier must take steps to reduce the amount of carbon tetrachloride so that it is consistently below that level. The following treatment methods have been approved by EPA for removing carbon tetrachloride : Granular activated charcoal in combination with Packed tower aeration.

How will I know if Carbon Tetrachloride is in my drinking water?

If the levels of carbon tetrachloride exceed the MCL, 5 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 5 ppb

Carbon Tetrachloride Releases to Water and Land, 1987 to 1993 (in pounds):

		Water	Land
TOTALS (in pounds)		**52,719**	**23,078**
Top Five States*			
TX	22,922	75	
WV	4	14,443	
LA	7,720	2,213	
AL	8,205	0	
CA	20	2,400	
Major Industries*			
Alkalies, chlorine		31,147	17,545
Inorganic chemicals		8,796	460
Petroleum refining		4,450	1,530
Misc. Indust. Organics		3,266	377
Agricultural chems.		817	2,400

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Chlordane and how is it used?

Chlordane is a viscous liquid, colorless to amber, with a slight chlorine-like aromatic odor. It was used on corn, citrus, deciduous fruits and nuts, vegetables; for home, garden and ornamentals; lawns, turf, ditchbanks and roadsides. It was applied directly to soil or foliage to control a variety of insect pests including parasitic roundworms and other nematodes, termites, cutworms, chiggers, leafhoppers. The only commercial use of chlordane products still permitted is for fire ant control in power transformers.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Velsicol 1068
Aspon-chlordane
Belt
Chlorindan
Chlor-Kil
Cortilan-Neu
Dowchlor
Oktachlor
Oktaterr

Synklor
Tat Chlor 4
Topiclor
Toxichlor
Intox 8
Gold Crest C-100
Kilex
Kypchlor
Niran
Termi-Ded
Prentox
Pentiklor

Why is Chlordane being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for chlordane has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below. Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 2 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found chlordane to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: central nervous system effects - including irritability, excess salivation, labored breathing, tremors, convulsions, deep depression - and blood system effects such as anemia and certain types of leukemia.

Long-term: Chlordane has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to liver, kidneys, heart, lungs, spleen and adrenal glands; cancer.

How much Chlordane is produced and released to the environment?

Chlordane has been released into the environment primarily from its application as an insecticide. The amount of chlordane used annually in the US prior to 1983 was estimated in 1985 to be greater that 3.6 million pounds. As of April 14, 1988, however, all commercial use of chlordane in the US has been canceled.

What happens to Chlordane when it is released to the environment?

Chlordane may persist for long periods of time in air, soil and water. Though chlordane tends to adhere to soil, its detection in various groundwaters in NJ and elsewhere indicates that it can leach to groundwater. It is only very slowly broken down by microbes. Chlordane has been detected in air samples in remote areas such as over the Pacific and Atlantic Oceans, and in the Arctic.

Chlordane has a great tendency to accumulate in aquatic organisms, but there is evidence that this is reversible once exposure is stopped.

How will Chlordane be Detected in and Removed from My Drinking Water?

The regulation for chlordane became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if chlordane is present above 0.2 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of chlordane so that it is consistently below that level. The following treatment methods have been approved by EPA for removing chlordane: granular activated charcoal.

How will I know if Chlordane is in my drinking water?

If the levels of chlordane exceed the MCL, 2 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 2 ppb

Learn more about your drinking water!

EPA strongly encourages people to learn more about their drinking water, and to support local efforts to protect and upgrade the supply of safe drinking water. Your water bill or telephone book's government listings are a good starting point.

Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPA's Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: CHLOROBENZENE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Chlorobenzene and how is it used?

Chlorobenzene is a colorless organic liquid with a faint, almond-like odor. The greatest use of chlorobenzene is in the manufacture of other organic chemicals, dyestuffs and insecticides. It is also a solvent for adhesives, drugs, rubber, paints and dry-cleaning, and as a fiber-swelling agent in textile processing.

The list of trade names given below may help you find out whether

you are using this chemical at home or work.

Trade Names and Synonyms:

Benzene chloride
Chlorbenzol
Monochlorobenzene
Phenyl chloride
IP Carrier T 40
Tetrosin SP

Why is Chlorobenzene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for chlorobenzene has been set at 0.1 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.1 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found chlorobenzene to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: anesthetic effects and impaired liver and kidney function.

Long-term: Chlorobenzene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: liver, kidney and central nervous system damage.

How much Chlorobenzene is produced and released to the environment?

Production of chlorobenzene in 1988 was 270 million pounds, and was expected to decrease. Major environmental releases of chlorobenzene are due to its use as a solvent in pesticides.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, chlorobenzene releases to water totalled over 326,000 lbs. Releases to land totalled nearly 37,000 lbs. These releases were primarily from alkali and chlorine industries which use chlorobenzene in chlorination processes. Most of these releases occurred in West Virginia.

What happens to Chlorobenzene when it is released to the environment?

Releases into water and onto land will either evaporate or be slowly degraded by microbes in the soil or water. Since it does not bind to soils, it can be expected to leach into the groundwater. Little accumulation is expected in fish and food products.

How will Chlorobenzene be Detected in and Removed from My Drinking Water?

The regulation for chlorobenzene became effective in 1989. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if chlorobenzene is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of chlorobenzene so that it is consistently below that level. The following treatment methods have been approved by EPA for removing chlorobenzene: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if Chlorobenzene is in my drinking water?

If the levels of chlorobenzene exceed the MCL, 0.1 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.1 ppm

Mcl: 0.1 ppm

Chlorobenzene Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**326,017**	**36,910**
Top Five States *		
WV	262,653	263
OH	20,598	12,500
NJ	13,710	13,261
LA	16,460	265
SC	1,401	5,939
Major Industries		
Alkalis, chlorine	261,058	67
Plastics, resins	23,756	13,312
Cyclic crudes, dyes	21,657	6,637
Indus. organics	13,460	9,375
Gum, wood chems	0	4,909

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346.

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Consumer Factsheet on: 2,4-D

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is 2,4-D and how is it used?

2,4-D is a colorless, odorless powder used as a herbicide for the control of broad-leaf weeds in agriculture, and for control of woody plants along roadsides, railways, and utilities rights of way. It has been most widely used on such crops as wheat and corn, and on pasture and rangelands.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

"Agent White"
Bladex-B
Brush Killer 64
Dicofur
Dormon
Ipaner
Moxon
Netagrone
Pielik
Verton 38
Mota Maskros
Silvaprop 1

Agricorn D
Acme LV4
Croprider
Fernesta
Lawn-Keep
Pennamine D
Plantgard
Tributon
Weed-B-Gon
Weedatul
Agroxone
Weedar
Salvo
Green Cross Weed-No-More 80
Red Devil Dry Weed Killer
Scott's 4XD
Weed-Rhap LV40
Weedone 100
2,4-Dichloro-phenoxyacetic acid

Why is 2,4-D being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for 2,4-D has been set at 70 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 70 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found 2,4-D to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: nervous system damage.

Long-term: 2,4-D has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to the nervous system, kidneys and liver.

How much 2,4-D is produced and released to the environment?

Production of 2,4-D was 45.1 million lbs in 1982. 1991 data indicates only that production exceeded 5000 lbs. Major environmental releases of 2,4-D are due to agricultural applications of systemic herbicides. It is also released as a result of the production or disposal of 2,4-D or its by-products.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, 2,4-D releases to land and water totalled over 116,000 lbs. These releases were primarily from cane sugar-related industries (except refineries). The largest releases occurred in Hawaii.

What happens to 2,4-D when it is released to the environment?

2,4-D is readily degraded by microbes in soil and water. Leaching to ground water may occur in coarse-grained sandy soils with low organic content or with very basic soils. In general little runoff occurs with 2,4-D or its amine salts. There is no evidence that bioconcentration of 2,4-D occurs through the food chain. This has been known from large-scale monitoring studies of soils, foods, feedstuffs, wildlife, human beings, and from other environmental cycling studies.

How will 2,4-D be Detected in and Removed from My Drinking Water?

The regulation for 2,4-D became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if 2,4-D is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of 2,4-D so that it is consistently below that level. The following treatment methods have been approved by EPA for removing 2,4-D: Granular activated charcoal.

How will I know if 2,4-D is in my drinking water?

If the levels of 2,4-D exceed the MCL, 70 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 70 ppb

Mcl: 70 ppb

2,4-D Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**3,444**	**113,358**

Top Five States	
HI	73,679
FL	38,456
MO	4440
MI	822
TX	800

Major Industries	
Cane sugar	99,886
Agri. chems.	815
Plastics, resins	696
Misc. manufact.	400
Gen. Chemical	126

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPA's Safe Drinking Water Hotline: (800)

426-4791.

For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346

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Consumer Factsheet on: DALAPON

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Dalapon and how is it used?

Dalapon is a colorless liquid with an acrid odor sold as sodium or magnesium salt. Dalapon is a herbicide used to control grasses in a wide variety of crops, including fruit trees, beans, coffee, corn, cotton and peas. It is also registered for use in a number of non-crop applications such as lawns, drainage ditches, along railroad tracks, and in industrial areas.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Revenge
Alatex
Basfapon
Basinex
Crisapon
Dawpon-RAE
Ded-Weed
Dowpon
Gramevin
Kenapon
Liropon

Propon
Radapon
Unipon
S-1315
S-95
2,2-DPA
2,2-dichloro-proprionic acid

Why is Dalapon being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for dalapon has been set at 0.2 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 0.2 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: Dalapon is not known to cause any health problems when people are exposed to it at levels above the MCL for relatively short periods of time.

Long-term: Dalapon has the potential to cause the following effects from a lifetime exposure at levels above the MCL: increased kidney-to-body weight.

How much Dalapon is produced and released to the environment?

Dalapon is released directly to the environment in its use as a herbicide for the control of annual and perennial grasses. Domestic production of dalapon in 1982 ranged between 7 and 9 million lbs. active ingredient. In 1984, its use in California was reported as follows: Non-food use, 92.9% (mostly on rights of way); main food crop treated was sugarbeet (6.7% of total).

What happens to Dalapon when it is released to the environment?

Dalapon leaches readily in soil, though in some soils, microbes may break it down fast enough to prevent ground water contamination. Still, a persistence of six months has been observed in soils of various forests and tree nurseries. Microbes will also degrade most of any releases to water. Accumulation in aquatic life is not expected to be a problem.

How will Dalapon be Detected in and Removed from My Drinking Water?

The regulation for dalapon became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if dalapon is present above 1 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of dalapon so that it is consistently below that level. The following treatment methods have been approved by EPA for removing dalapon: Granular activated charcoal.

How will I know if Dalapon is in my drinking water?

If the levels of dalapon exceed the MCL, 0.2 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.2 ppm

Mcl: 0.2 ppm

Learn more about your drinking water!

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government listings are a good starting point.

Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPA's Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: DIBROMOCHLOROPROPANE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is DBCP and how is it used?

Dibromochloropropane, or DBCP is a dense yellow organic liquid with a pungent odor. It is used primarily as an unclassified nematocide for soil fumigation of cucumbers, summer squash, cabbage, cauliflower, carrots, snap beans, okra, aster, shasta daisy, lawn grasses and ornamental shrubs.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

DBCP
BBC 12
Fumagon
Fumazone
Nemabrom
Nemafum
Nemagon
Nemanax
Nemapaz
Nemaset
Nemazon
Gro-Tone Nematode
Durham Nematocide

Why is DBCP being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for DBCP has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.2 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found DBCP to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: kidney and liver damage and atrophy of the testes.

Long-term: DBCP has the potential to cause the following effects from a lifetime exposure at levels above the MCL: kidney damage and antifertility; cancer.

How much DBCP is produced and released to the environment?

In the past, release of DBCP to the environment occurred primarily from its fumigant and nematocide uses. In 1977, 831,000 pounds of DBCP was used in CA alone, mainly on grapes and tomatoes. In 1974, USA farmers applied 9.8 million pounds of DBCP on crops. All registrations of end use products were canceled in 1979 except for the use as a soil fumigant against nematodes on pineapples in Hawaii. This use was canceled in 1985.

What happens to DBCP when it is released to the environment?

DBCP released to soil will most likely evaporate or leach to groundwater. Break down by microbes is slow by comparison. Once in the atmosphere, DBCP is expected to be broken down fairly quickly by sunlight. DBCP is not likely to accumulate in aquatic life.

How will DBCP be Detected in and Removed from My Drinking Water?

The regulation for DBCP became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if DBCP is present above 0.02 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of DBCP so that it is consistently below that level. The following treatment methods have been approved by EPA for removing DBCP: Granular activated charcoal together with Packed Tower Aeration.

How will I know if DBCP is in my drinking water?

If the levels of DBCP exceed the MCL, 0.2 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 0.2 ppb

Learn more about your drinking water!

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Consumer Factsheet on: ORTHO-DICHLOROBENZENE (o-DCB)

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is o-DCB and how is it used?

Ortho-dichlorobenzene, (o-DCB) is a colorless organic liquid with a pleasant, aromatic odor. The greatest use of o-dichlorobenzene is as a chemical intermediate for making agricultural chemicals, primarily herbicides. Other present and past uses include: solvent for waxes, gums, resins, wood preservatives, paints; insecticide for termites and borers; in making dyes; as a coolant, deodorizer, degreaser.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

ortho-Dichlorobenzol
Dilantin
Dowtherm E
Chloroben
Dilatin DB

Why is o-DCB being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for o-DCB has been set at 0.6 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.6 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: o-DCB is not known to cause any health problems when people are exposed to it at levels above the MCL for relatively short periods of time.

Long-term: o-DCB has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to the nervous system, liver, kidneys and blood cells.

How much o-DCB is produced and released to the environment?

Production of o-DCB was estimated at 43 million lbs. in 1991. Its use in manufacturing and solvents may be significant sources of discharges into water. Dichlorobenzenes also enter water systems from the use of o-DCB as a deodorant in industrial wastewater treatment. Chemical waste dump leachates and industrial wastewater are the major source of pollution of dichlorobenzenes to Lake Ontario.

From 1987 to 1993, according to the Toxic Release Inventory, o-DCB releases to land and water totalled 248 million lbs., mostly to land. These releases were primarily form organic chemical manufacturing industries. The largest releases occurred in New Jersey.

What happens to o-DCB when it is released to the environment?

If released to soil, o-DCB can bind to soil particles. However, its detection in groundwater indicates that leaching can occur. It will evaporate from soil or surface water and will be broken down by microbes. o-DCB is likely to accumulate in fish and other aquatic life.

How will o-DCB be Detected in and Removed from My Drinking Water?

The regulation for o-DCB became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if o-DCB is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of o-DCB so that it is consistently below that level. The following treatment methods have been approved by EPA for removing o-DCB: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if o-DCB is in my drinking water?

If the levels of o-DCB exceed the MCL, 0.6 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.6 ppm

Mcl: 0.6 ppm

o-DCB Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**75,967**	**171,663**
Top Five States *		
NJ	19,602	165,661
WV	39,653	0
OR	7,260	0
SC	1,502	4,628
TX	1,418	1,000
Major Industries		
Industrial Organics	15,416	98,092
Cyclic crudes, dyes	7,639	67,418
Alkalis, chlorine	38,029	0
Paper mills	7,260	0
Gum, wood chems.	250	4,378

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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List of Contaminants

Consumer Factsheet on: PARA-DICHLOROBENZENE (p-DCB)

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is p-DCB and how is it used?

Para-dichlorobenzene (p-DCB) is an organic solid of white crystals with a mothball-like odor. It is used mainly as an insecticidal fumigant against clothes moths and as a deodorant for garbage and restrooms. It is also used as an insecticide and fungicide on crops, and in the manufacture of other organic chemicals and in plastics, dyes, pharmaceuticals.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Paradichlorobenzene
Paradichlorobenzol
Paramoth
Di-Chloricide
Paradi
Paradow
Persia-Perazol
Evola
Parazene

Why is p-DCB being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for p-DCB has been set at 75 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 75 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found p-DCB to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: nausea, vomiting, headaches, and irritation of the eyes and respiratory tract.

Long-term: p-DCB has the potential to cause the following effects from a lifetime exposure at levels above the MCL: anemia, skin lesions, appetite loss, damage to liver and changes in blood.

How much p-DCB is produced and released to the environment?

74 million lbs. of p-DCB were consumed by industry in 1986, and demand was predicted to increase. Chemical waste dump leachates and direct manufacturing effluents are reported to be the major source of p-DCB pollution in Lake Ontario.

From 1987 to 1993, according to the Toxic Release Inventory, p-DCB releases to water totalled almost 34,000 lbs. Releases to land totalled nearly 4,500 lbs. These releases were primarily from a single chemical manufacturing plant in West Virginia.

What happens to p-DCB when it is released to the environment?

p-DCB only moderately binds to soil so it may leach to ground water. Otherwise, it will evaporate and be slowly broken down by microbes. If released to water, it will largely evaporate. p-DCB is not likely to accumulate in most aquatic life, though it may in some fishes.

How will p-DCB be Detected in and Removed from My Drinking Water?

The regulation for p-DCB became effective in 1989. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if p-DCB is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water

supplier must take steps to reduce the amount of p-DCB so that it is consistently below that level. The following treatment methods have been approved by EPA for removing p-DCB: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if p-DCB is in my drinking water?

If the levels of p-DCB exceed the MCL, 75 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 75 ppb

Mcl: 75 ppb

p-DCB Releases to Water and Land, 1987 to 1993 (in pounds):

		Water	Land
	TOTALS (in pounds)	**33,675**	**4,482**
	Top Five States*		
WV	27,676	0	
TX	1,280	3,132	
DE	1,870	200	
GA	750	0	
LA	503	0	
	Major Industries		
Alkalies, chlorine		27,676	0
Industrial org. chem.		3,076	3,350
Agricultural chem.		750	0
Cyclic crudes, intermed.		600	0

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

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Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: 1,2-DICHLOROETHANE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is 1,2-DCA and how is it used?

1,2-Dichloroethane (1,2-DCA) is a colorless, oily, organic liquid with a sweet, chloroform-like odor. The greatest use of 1,2-dichloroethane is in making chemicals involved in plastics, rubber and synthetic textile fibers. Other uses include: as a solvent for resins and fats, photography, photocopying, cosmetics, drugs; and as a fumigant for grains and orchards.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

1,2-Ethylene dichloride
Glycol dichloride
Freon 150
Borer sol
Brocide
Destruxol borer-sol
Dichlor-mulsion
Dutch oil
Granosan

Why is 1,2-DCA being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for 1,2-dichloroethane has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 5 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found 1,2-dichloroethane to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: central nervous system disorders, and adverse lung, kidney, liver circulatory and gastrointestinal effects.

Long-term: 1,2-Dichloroethane has the potential to cause the following effects from a lifetime exposure at levels above the MCL: cancer.

How much 1,2-DCA is produced and released to the environment?

Production of 1,2-dichloroethane was 18 billion lbs. in 1993. It is released in waste water, spills, and/or improper disposal primarily from its use as a cleaning solvent, in making other organics, and in pesticides.

From 1987 to 1993, according to the Toxics Release Inventory, releases to water and land totalled over 455,000 lbs. These releases were primarily from facilities which make industrial organic chemicals, alkalis and chlorine. The largest releases occurred in New Jersey and Louisiana.

What happens to 1,2-DCA when it is released to the environment?

While releases to water or soil will evaporate quickly, 1,2-dichloroethane will also leach into groundwater rapidly where it is likely to persist for a very long time. There is little degradation by microbes. 1,2-Dichloroethane is not expected to accumulate in fish.

How will 1,2-DCA be Detected in and Removed from My Drinking Water?

The regulation for 1,2-dichloroethane became effective in 1989. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if 1,2-dichloroethane is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of 1,2-dichloroethane so that it is consistently below that level. The following treatment methods have been approved by EPA for removing 1,2-dichloroethane: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if 1,2-DCA is in my drinking water?

If the levels of 1,2-dichloroethane exceed the MCL, 5 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 5 ppb

1,2-DCA Releases to Water and Land, 1987 to 1993 (in pounds):

		Water	Land
	TOTALS (in pounds)	**433,056**	**22,616**
	Top Six States*		
NJ	192,700	231	
LA	136,508	2,292	
TX	36,459	7,028	
MO	6,786	8,730	
NY	11,330	0	
KY	10,309	0	
	Major Industries		
Industrial organics		211,146	363
Alkalies, chlorine		120,283	3,254
Cyclic crudes, intermed.		32,945	119
Agricultural chemicals		11,918	8,980
Industrial gases		15,497	0
Plastics materials, resins		6,908	6,895
Photographic equip.		11,566	0
Other Chemicals		8,179	0
Pharmaceuticals		7,525	521
Petroleum refining		1,730	1,479

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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Consumer Factsheet on: 1,1-DICHLOROETHYLENE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is 1,1-DCE and how is it used?

1,1-Dichloroethylene (1,1-DCE) is an organic liquid with a mild, sweet, chloroform-like odor. Virtually all of it is used in making adhesives, synthetic fibers, refrigerants, food packaging and coating resins such as the saran types.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

1,1-DCE
1,1-Dichloroethene
Asym-dichloro-ethylene
Vinylidene chloride

Why is 1,1-DCE being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for 1,1-DCE has been set at 7 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible,

considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 7 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found 1,1-DCE to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: liver damage.

Long-term: 1,1-DCE has the potential to cause the following effects from a lifetime exposure at levels above the MCL: liver and kidney damage, as well as toxicity to the developing fetus; cancer.

How much 1,1-DCE is produced and released to the environment?

An estimated 90,700 tons/yr of 1,1-DCE were produced in the USA during the early 1980s. It may be released by evaporation or in wastewater during its production and use in the manufacture of plastic wrap, adhesives, and synthetic fiber. It may also form in groundwater that has been contaminated by similar solvents.

From 1987 to 1993, according to the Toxics Release Inventory, releases to water and land totalled over 11,500 lbs. These releases were primarily from facilities which make plastics materials/resins. The largest releases occurred in Kentucky.

What happens to 1,1-DCE when it is released to the environment?

Releases to water will primarily be lost to the atmosphere through evaporation. 1,1-DCE will evaporate from soil and will leach into the groundwater where its fate is unknown, but degradation is expected to be slow. Its tendency to accumulate in aquatic life is unknown but expected to be minor.

How will 1,1-DCE be Detected in and Removed from My Drinking Water?

The regulation for 1,1-DCE became effective in 1989. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if 1,1-DCE is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of 1,1-DCE so that it is consistently below that level. The following treatment methods have been approved by EPA for removing 1,1-DCE: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if 1,1-DCE is in my drinking water?

If the levels of 1,1-DCE exceed the MCL, 7 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing

alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 7 ppb

Mcl: 7 ppb

1,1-DCE Releases to Water and Land, 1987 to 1993 (in pounds):

		Water	Land
	TOTALS (in pounds)	**10,101**	**1,488**
	Top States		
KY	2,880	286	
TX	2,061	150	
LA	2,079	3	
	Major Industries		
Plastics materials, resins		3,942	1,299
Alkalies, chlorine		4,173	154

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Technical Factsheet on: 1,2-DICHLOROETHYLENE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

Drinking Water Standards

MCLG: cis-0.07; trans-0.1 mg/L
MCL: cis-0.07; trans-0.1 mg/L
HAL(child)- 1 day: cis-4; trans-20
: Longer-term: cis-3; trans-2

Health Effects Summary

Acute: EPA has found cis- and trans- 1,2-dichloroethylene to potentially cause central nervous system depression from short-term exposures at levels above the MCL.

Short-term exposures in drinking water which are considered "safe" for a 10-kg (22 lb.) child consuming 1 liter of water per day: for the cis form- a one-day exposure of 4 mg/L or upto a 7-year exposure to 3 mg/L. For the trans isomer: a one-day exposure of 20 mg/L or upto a 7-year exposure to 2 mg/L.

Chronic: Both cis- and trans-1,2-DCE have the potential to cause liver, circulatory and nervous system damage from long-term exposure at levels above the MCL. The trans isomer is approximately twice as potent as the cis- isomer in its ability to depress the central nervous system.

Cancer: There is inadequate evidence to state whether or not either cis- or trans-1,2-DCE have the potential to cause liver cancer from a lifetime exposure in drinking water.

Usage Patterns

Both the cis and trans forms - usually as a mixture - are used as a solvent for waxes, resins, and acetylcellulose; in the extraction of rubber; as a refrigerant; in the manufacture of pharmaceuticals and artificial pearls and in the extraction of oils and fats from fish and meat; as a chemical intermediate for making chlorinated compounds.

No data were available on recent production levels in the United States.

Release Patterns

Releases to the environment are expected to be limited to manufacturing plants in the Gulf Region of the United States. Since cis-and trans-1,2-DCE are not listed chemicals in the Toxics Release Inventory, data on releases during manufacture and handling are not available.

Trans-1,2-dichloroethylene may be released to the environment in air emissions and wastewater during its production and use as a solvent and extractant, in organic synthesis, and in the manufacture of perfumes, lacquers, and thermoplastics.

An assessment of the sources of trans-1,2-dichloroethylene is complicated by the fact that it is a priority pollutant while the cis isomer is not and the standard EPA methods of analysis do not allow the isomers to differentiated. This has resulted in monitoring reports erroneously listing the trans isomer when the cis isomer is present. The Michigan Department of Health has the capability of distinguishing these isomers and claims that it frequently finds the cis isomer and, if concentrations are high, they occasionally find traces of the trans isomer.

Environmental Fate

Both the cis- and trans-1,2-dichloroethylenes may be released to the environment in air emissions and wastewater during its production and use. Under anaerobic conditions that may exist in landfills, aquifers, or sediment one is likely to find 1,2-dichloroethylenes that are formed as breakdown products from the reductive dehalogenation of common industrial solvents trichloroethylene, tetrachloroethylene, and 1,1,2,2-tetrachloroethane.

The cis-1,2-dichloroethylene is apparently the more common isomer found although it is mistakenly reported as the trans isomer. The trans-isomer, being a priority pollutant, is more commonly analyzed for and the analytical procedures generally used do not distinguish between isomers.

If 1,2-dichloroethylenes are released on soil, it should evaporate and leach into the groundwater where very slow biodegradation should occur. If released into water, 1,2-dichloroethylenes will be lost mainly through volatilization.

In the atmosphere, 1,2-dichloroethylenes will be lost by reaction with photochemically produced hydroxyl radicals and scavenged by rain. Because it is relatively long-lived in the atmosphere, considerable dispersal from source areas should occur.

Biodegradation, adsorption to sediment, and bioconcentration in aquatic organisms should not be significant.

Chemical/Physical Properties

CAS Number: cis- 156-59-2 trans- 156-60-5

Color/ Form/Odor: Colorless, odorless liquid

M.P.: cis- -80 C; trans- -50 C

B.P.: cis- 60.3 C; trans- 48 C

Vapor Pressure: cis- 273 mm Hg at 30 C; trans- 395 mm Hg at 30 C

Octanol/Water Partition (Kow): Log Kow = cis- 1.86; trans- 2.06

Density/Spec. Grav.: cis- 1.26 at 20 C trans- 1.28 at 20 C

Solubility: Soluble in water, cis- 3.5 g/L of water, trans- 6.3 g/L of water at 25 C

Soil sorption coefficient: Kocs of cis and trans isomers are estimated at 36 to 49; high to very high mobility in soil

Odor/Taste Thresholds: N/A

Henry's Law Coefficient: cis- 0.00337 atm-cu m/mole; trans- 0.00672 atm-cu m/mole

Bioconcentration Factor: BCFs of cis and trans isomers are estimated at 15 to 22; not expected to bioconcentrate in aquatic organisms.

Trade Names/Synonyms: Both isomers- 1,2-DCE, Acetylene dichloride; cis- Z-1,2-dichloroethene; trans- E-1,2-dichloroethene, sym-dichloroethylene

Other Regulatory Information

Monitoring:

-- For Ground/Surface Water Sources:

Initial Frequency- 4 quarterly samples every 3 years

Repeat Frequency- Annually after 1 year of no detection

-- Triggers - Return to Initial Freq. if detect at > 0.0005 mg/L

Analysis

Reference Source	**Method Numbers**

EPA 600/4-88-039	502.2; 524.2

Treatment/Best Available Technologies: Granular Activated Charcoal and Packed Tower Aeration

For Additional Information

EPA can provide further regulatory or other general information:
EPA Safe Drinking Water Hotline - 800/426-4791

Other sources of toxicological and environmental fate data include:
Toxic Substance Control Act Information Line - 202/554-1404
Toxics Release Inventory, National Library of Medicine - 301/496-6531
Agency for Toxic Substances and Disease Registry - 404/639-6000

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Drinking Water For Kids!

Consumer Factsheet on: DICHLOROMETHANE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is DCM and how is it used?

Dichloromethane (DCM) is a colorless organic liquid with a sweet, chloroform-like odor. The greatest use of DCM is as a paint remover. Other uses include: solvent and cleaning agent in a variety of industries, a fumigant for strawberries and grains; and to extract substances from foodstuffs.

The list of synonyms given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

DCM
Methylene chloride

Why is DCM being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for dichloromethane has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 5 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found dichloromethane to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: Damage to the nervous system and to blood.

Long-term: Dichloromethane has the potential to cause the following effects from a lifetime exposure at levels above the MCL: liver damage; cancer.

How much DCM is produced and released to the environment?

Production of DCM has been decreasing: from a high of 561 million lbs. in 1986, to roughly 410 million lbs. in 1993. It is released in wastewater primarily from the following industries: Paint and ink, aluminum forming, coal mining, photographic equipment and supplies, pharmaceutical, organic chemical/plastics, metal foundries and laundries. DCM is also formed during the chlorination of water.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, DCM releases to land and water totalled over 2.1 million lbs. These releases were primarily from medicinals and botanicals industries. The largest releases occurred in Connecticut and New York.

What happens to DCM when it is released to the environment?

Most DCM is released to air where it is degraded by sunlight within a few months. Releases to water evaporate very quickly. It will evaporate from soil but can also leach through soil to ground water. DCM is not likely to accumulate in aquatic life.

How will DCM be Detected in and Removed from My Drinking Water?

The regulation for dichloromethane became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if dichloromethane is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of dichloromethane so that it is consistently below that level. The following treatment methods have been approved by EPA for removing dichloromethane: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if DCM is in my drinking water?

If the levels of dichloromethane exceed the MCL, 5 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 5 ppb

DCM Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**1,544,694**	**556,830**
Top Ten States*		
CT	940,158	0
NY	58,400	155,755
GA	166,700	0
NJ	138,302	2,721
WI	0	139,920
SC	20,860	52,810
MI	39,575	32,900
KS	0	33,489
MO	0	27,295
TX	15,910	823
Major Industries*		
Medicinals, botanicals	1,106,858	0
Photographic supplies	58,400	155,755
Misc Indust. organics	141,942	53,741
Custom plastics, resins	0	139,920
Pharmaceuticals	37,575	0
Potato/corn chips&snacks	2,000	32,900
Air conditioning/heating	0	33,489
Steel pipe, tubing	0	27,295

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

EPA strongly encourages people to learn more about their drinking water, and to support local efforts to protect and upgrade the supply of safe drinking water. Your water bill or telephone books government listings are a good starting point.

Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

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For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346.

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Consumer Factsheet on: 1,2-DICHLOROPROPANE

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is 1,2-DCP and how is it used?

1,2-Dichloropropane (1,2-DCP) is a colorless organic liquid with a chloroform-like odor. The greatest use of 1,2-dichloropropane is in making other organic chemicals. It is also used in making lead-free gasoline, paper coating, soil fumigant for nematodes, and insecticide for stored grain.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Propylene dichloride
Nematox
Vidden D
Dowfume EB-5

Why is 1,2-DCP being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for 1,2-DCP has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible,

considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 5 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found 1,2-DCP to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: damage to the liver, kidneys, adrenal glands, bladder, and the gastrointestinal and respiratory tracts.

Long-term: 1,2-DCP has the potential to cause the following effects from a lifetime exposure at levels above the MCL: the liver, kidneys, bladder, gastrointestinal tract and the respiratory tract; cancer.

How much 1,2-DCP is produced and released to the environment?

Production of 1,2-DCP has decreased greatly since a 1980 report of 77 million lbs. Dow Chemical, the only listed producer, discontinued its production in 1991. It may be released into the atmosphere or in wastewater during its production or use as an intermediate in chemical manufacture. There were also significant releases during its former use as a soil fumigant. It may also leach from municipal landfills.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, 1,2-dichloropropane releases to land and water totalled nearly 104,000 lbs. These releases were primarily from chemical industries. The largest releases occurred in New York.

What happens to 1,2-DCP when it is released to the environment?

1,2-DCP released to soil will largely evaporate. However, it has been detected in groundwater. Releases to surface water will also evaporate, and are not likely to accumulate in aquatic life.

How will 1,2-DCP be Detected in and Removed from My Drinking Water?

The regulation for 1,2-DCP became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if 1,2-DCP is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of 1,2-DCP so that it is consistently below that level. The following treatment methods have been approved by EPA for removing 1,2-DCP: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if 1,2-DCP is in my drinking water?

If the levels of 1,2-DCP exceed the MCL, 5 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 5 ppm

1,2-DCP Releases to Water and Land, 1987 to 1993 (in pounds):

		Water	Land
TOTALS (in pounds)		**98,504**	**5,470**
Top Five States			
NY	30,000	3,205	
LA	25,586	260	
VA	14,629	250	
TX	12,290	1,206	
NJ	10,463	0	
Major Industries			
Alkalies, chlorine		37,297	1,216
Photographic equip.		30,000	3,205
Gum, wood chemicals		14,629	250
Plastics, resins		10,463	0
Misc. Indust. Organics		4,793	250

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

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Consumer Factsheet on: DINOSEB

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Dinoseb and how is it used?

Dinoseb is an organic solid - yellowish crystals with a pungent odor. Its greatest use is as a contact herbicide for post-emergence weed control in cereals, undersown cereals, seedling lucerne and peas. Dinoseb is also used as a corn yield enhancer and an insecticide and miticide.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Aatox
Chemox
Gebutox
Knox-weed
Basanite
BNP 20
Butaphene
Dibutox
Dinitrall
Dinitro
Desicoil
Dow Selective Weed Killer

Hivertox
Ladob
Laseb
Nitropone C
Dytop
Premerge
Hel-fire
Caldon
Kiloseb
Sinox General
Subitex
Dinitrobutyl-phenol

Why is Dinoseb being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for dinoseb has been set at 7 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 7 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found dinoseb to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: sweating, headache, mood changes.

Long-term: Dinoseb has the potential to cause the following effects from a lifetime exposure at levels above the MCL: decreased body and thyroid weight, degeneration of testes; thickening of intestinal lining.

How much Dinoseb is produced and released to the environment?

1982 production of dinoseb was reported as 6.2 million pounds, used primarily on soybeans and vegetables. Release of dinoseb has resulted primarily from its use as an herbicide on a variety of weeds.

What happens to Dinoseb when it is released to the environment?

Dinoseb is degraded slowly by soil bacteria and binds weakly to soil. Therefore, leaching in soil is possible and dinoseb has been detected in groundwater. In water, dinoseb is mainly broken down by sunlight. It is not likely to accumulate in aquatic life.

How will Dinoseb be Detected in and Removed from My Drinking Water?

The regulation for dinoseb became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if dinoseb is present above 0.2 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of dinoseb so that it is consistently below that level. The following treatment methods have been approved by EPA for removing dinoseb: Granular activated charcoal.

How will I know if Dinoseb is in my drinking water?

If the levels of dinoseb exceed the MCL, 7 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 7 ppb

Mcl: 7 ppb

Learn more about your drinking water!

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Your state Department of Health/Environment is also a valuable source of information.

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Consumer Factsheet on: DIOXIN (2,3,7,8-TCDD)

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Dioxin and how is it used?

Dioxin is an organic solid of white crystalline needles. Dioxin is not produced or used commercially in the US. It is a contaminant formed in the production of some chlorinated organic compounds, including a few herbicides such as silvex. It may also be formed during combustion of a variety of chlorinated organic compounds.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Dioxin
Tetradioxin

Why is Dioxin being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for dioxin has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.00003 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found dioxin to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: liver damage, weight loss, wasting of glands important to the body's immune system.

Long-term: Dioxin has the potential to cause the following effects from a lifetime exposure at levels above the MCL: a variety of reproductive effects, from reduced fertility to birth defects; cancer.

How much Dioxin is produced and released to the environment?

Dioxin is released to the environment in emissions from the incineration of municipal refuse and certain chemical wastes, in exhaust from automobiles powered by leaded gasoline, in emissions from wood burning in the presence of chlorine, in accidental fires involving transformers containing PCBs and chlorinated benzenes, and from the improper disposal of certain chlorinated chemical wastes. It has been released to the environment as a low level impurity in various pesticides.

What happens to Dioxin when it is released to the environment?

Dioxin is one of the most toxic and environmentally stable tricyclic aromatic compounds of its structural class. Due to its very low water solubility, most of the dioxin occurring in water will adhere to sediments and suspended silts. Similarly, it tends to adhere to soil if released to land, and is not likely to leach to ground water. Two processes which may be able to remove dioxin from water and soil are evaporation and breakdown by sunlight. Dioxin is generally resistant to microbial breakdown. Dioxin has a very great tendency to accumulate in aquatic life, from algae to fish.

How will Dioxin be Detected in and Removed from My Drinking Water?

The regulation for dioxin became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if dioxin is present above 5 parts per trillion. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of dioxin so that it is consistently below that level. The following treatment methods have been approved by EPA for removing dioxin: Granular activated charcoal.

How will I know if Dioxin is in my drinking water?

If the levels of dioxin exceed the MCL, 0.00003 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 0.00003 ppb

Learn more about your drinking water!

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Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPA's Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: DIQUAT

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Diquat and how is it used?

Diquat is an organic solid of colorless or yellow crystals. A water solution is dark red-brown. Diquat is a herbicide that has been used extensively in the US since the late 1950s to control both crop and aquatic weeds. It is used on potatoes; as an aid in harvesting cotton, rapeseed and other oil seed crops; to wilt and dry out silage, standing hay, etc. for storage; a plant growth regulator and sugar cane-flowering suppressant.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Reglone

Why is Diquat being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for diquat has been set at 20 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 20 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found diquat to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: dehydration.

Long-term: Diquat has the potential to cause the following effects from a lifetime exposure at levels above the MCL: cataracts.

How much Diquat is produced and released to the environment?

Diquat usage in 1980 was estimated to be 200,000 lbs. of active ingredient. 1982 data indicates that diquat was not produced domestically, but imports were nearly 835,000 lbs. Diquat is released into the environment during its use as a contact herbicide, aquatic weed control agent, harvesting aid, or plant growth regulator. It may also be released into wastewater or in spills during its manufacture, transport and storage.

What happens to Diquat when it is released to the environment?

Diquat rapidly adheres to soil particles. Though it is resistant to breakdown by microbes or other means, this binding to soil serves to deactivate it.

Diquat is removed rapidly from water, disappearing in 2-4 weeks. It has little or no tendency to accumulate in fish.

How will Diquat be Detected in and Removed from My Drinking Water?

The regulation for diquat became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if diquat is present above 0.4 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of diquat so that it is consistently below that level. The following treatment methods have been approved by EPA for removing diquat: Granular activated charcoal.

How will I know if Diquat is in my drinking water?

If the levels of diquat exceed the MCL, 20 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 20 ppb

Mcl: 20 ppb

Learn more about your drinking water!

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Consumer Factsheet on: ENDOTHALL

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Endothall and how is it used?

Endothall is an organic solid of white odorless crystals. Endothall is used as a defoliant for a wide range of crops and as a herbicide for both terrestrial and aquatic weeds. It is used as a desiccant

on lucerne and on potato, for the defoliation of cotton, to control aquatic weeds and as an aquatic algicide growth regulator. It has been used for: sugar beets, turf, hops sucker suppression; alfalfa, clover desiccants; potato vine killers.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Accelerate
Aquathol
Des-i-cate
Endothall Turf Herbicide
Endothall Weed Killer
Herbicide 273
Hydrothol
Herbon Pennout
Hydout

Why is Endothall being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for endothall has been set at 0.1 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.1 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found endothall to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: depressed breathing and heart rate.

Long-term: Endothall has the potential to cause the following effects from a lifetime exposure at levels above the MCL: increase in size of some internal organs, particularly the stomach and intestine.

How much Endothall is produced and released to the environment?

EPA estimated total domestic usage in 1982 to have been approximately 1.5 million lbs. Release of endothall to the environment is expected to occur primarily during its use as a pre-emergence, post-emergence, turf and aquatic herbicide and harvest aid. Other sources of release include loss during manufacturing, formulation, packaging or disposal of this herbicide.

What happens to Endothall when it is released to the environment?

Endothall is expected to be quickly broken down by microbes in soil or water. It is also able to leach through soil into ground water; however, rapid degradation would limit the extent of leaching.

Endothall is not likely to accumulate in aquatic life.

How will Endothall be Detected in and Removed from My Drinking Water?

The regulation for endothall became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if endothall is present above 9 parts per billion. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of endothall so that it is consistently below that level. The following treatment methods have been approved by EPA for removing endothall: Granular activated charcoal.

How will I know if Endothall is in my drinking water?

If the levels of endothall exceed the MCL, 0.1 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.1 ppm

Mcl: 0.1 ppm

Learn more about your drinking water!

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Consumer Factsheet on: ENDRIN

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Endrin and how is it used?

Endrin is an organic solid of odorless white crystals. Endrin is an insecticide which has been used mainly on field crops such as cotton, maize, sugarcane, rice, cereals, ornamentals, and other crops. It has also been used for grasshoppers in non-cropland and to control voles and mice in orchards. Once widely used in the US, most uses were canceled in 1980.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Nendrin
EN 57
Endrex
Endricol
Hexadrin
Mendrin
Oktanex
Compound 269

Why is Endrin being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for endrin has been set at 2 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 2 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found endrin to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: tremors, labored breathing, mental confusion, convulsions.

Long-term: Endrin has the potential to cause the following effects from a lifetime exposure at levels above the MCL: convulsions and damage to liver tissue.

How much Endrin is produced and released to the environment?

Production in 1980 was reported to be 100,000 lbs. Endrin's former source in the environment is from use as an insect, bird and rat-killer. It has been used on agricultural crops, cotton seeds, control of birds on buildings and mice in orchards. Its major use has been on cotton crops. The EPA presently considers the pesticide canceled.

What happens to Endrin when it is released to the environment?

Endrin is very persistent, but it is known to be broken down by sunlight. Endrin released to soils will persist for up to 14 years or more. Its strong adsorption to soil makes leaching into groundwater unlikely. However, the detection of endrin in certain groundwater samples suggest that leaching may be possible in some soils. Endrin released to water systems will also persist, mainly in sediments.

It has a very high potential to accumulate in fish and shellfish.

How will Endrin be Detected in and Removed from My Drinking Water?

The regulation for endrin became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if endrin is present above 0.01 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of endrin so that it is consistently below that level. The following treatment methods have been approved by EPA for removing endrin: Granular activated charcoal.

How will I know if Endrin is in my drinking water?

If the levels of endrin exceed the MCL, 2 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 2 ppb

Mcl: 2 ppb

Learn more about your drinking water!

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For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346

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Consumer Factsheet on: EPICHLOROHYDRIN

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Epichlorohydrin and how is it used?

Epichlorohydrin is a colorless organic liquid with a pungent, garlic-like odor. The greatest use of epichlorohydrin is used to make glycerin and as a building block in making plastics and other polymers, some of which are used in water supply systems. It is also used in the paper and drug industries and as an insect fumigant.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Chloromethyl-ethylene oxide
Chloromethyl-oxirane
Glycidyl chloride

Why is Epichlorohydrin being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for epichlorohydrin has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

There are currently no acceptable means of detecting epichlorohydrin in drinking water. In this case, EPA is requiring water suppliers to use a special treatment technique to control its amount in water. Since epichlorohydrin is used in drinking water treatment processes, it is being controlled simply by limiting its use for this purpose.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found epichlorohydrin to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: skin irritation; detrimental effects on liver, kidneys, central nervous system.

Long-term: Epichlorohydrin has the potential to cause the following effects from a lifetime exposure at levels above the MCL: stomach, eye and skin irritation; chromosome aberrations; adverse changes in blood; cancer.

How much Epichlorohydrin is produced and released to the environment?

Production and imports of epichlorohydrin in the mid-1980s totalled 511 million lbs. The main source of concern for epichlorohydrin in drinking water is from its use as a clarifier during water treatment. When added to water, it coagulates and traps suspended solids for easier removal. However, some epichlorohydrin may not coagulate and may remain in the water as a contaminant.

What happens to Epichlorohydrin when it is released to the environment?

Epichlorohydrin readily evaporates from near-surface soils and surface waters. It will not bind to sediments in water bodies. If spilled on land, it may leach into the groundwater but it is easily broken down by a number of chemical reactions. It will not accumulate in aquatic life.

How will Epichlorohydrin be Detected in and Removed from My Drinking Water?

The regulation for epichlorohydrin became effective in 1992. EPA requires your water supplier to show that when epichlorohydrin is added to water, the amount of uncoagulated epichlorohydrin is less than 2 ppb.

How will I know if Epichlorohydrin is in my drinking water?

If the treatment technique for epichlorohydrin fails, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: Treatment Technique

Epichlorohydrin Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**42,705**	**22,849**

Top Five States

AL	29,385	18,476
LA	6,924	2,663
NJ	2,164	16
TX	200	1,396
AR	1,594	0

Major Industries

Industrial organics	25,137	14,941
Plastics and resins	6,392	2,509
Industrial inorganics	4,200	1,600
Agricultural chemicals	2,207	1,532
Alkalis, chlorine	2,100	1,033

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Consumer Factsheet on: ETHYLBENZENE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Ethylbenzene and how is it used?

Ethylbenzene is a colorless organic liquid with a sweet, gasoline-like odor. The greatest use - over 99 percent - of ethylbenzene is to make styrene, another organic liquid used as a building block for many plastics. It is also used as a solvent for coatings, and in making rubber and plastic wrap.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Ethylbenzol
Phenylethane

Why is Ethylbenzene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for ethylbenzene has been set at 0.7 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants

using suitable treatment technologies.

The MCL has also been set at 0.7 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found ethylbenzene to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: drowsiness, fatigue, headache and mild eye and respiratory irritation.

Long-term: Ethylbenzene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to the liver, kidneys, central nervous system and eyes.

How much Ethylbenzene is produced and released to the environment?

Production of ethylbenzene has increased: from 6.9 billion lbs. in 1982 to 11.8 billion lbs in 1993. It is released to the air primarily from its use in gasoline. More localized may be due to waste water and spills from its production and industrial use.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, ethylbenzene releases to water and land totalled over 761,000 lbs. These releases were primarily from petroleum refining industries. The largest releases occurred in Texas. The largest direct releases to water occurred in Virginia.

What happens to Ethylbenzene when it is released to the environment?

Ethylbenzene will evaporate rapidly from water, and will be degraded by microbes. It binds only moderately to aquatic sediment and to soils. Thus, it may leach to ground water if released to land. Ethylbenzene has little potential for accumulating in aquatic life.

How will Ethylbenzene be Detected in and Removed from My Drinking Water?

The regulation for ethylbenzene became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if ethylbenzene is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of ethylbenzene so that it is consistently below that level. The following treatment methods have been approved by EPA for removing ethylbenzene: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if Ethylbenzene is in my drinking water?

If the levels of ethylbenzene exceed the MCL, 0.7 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.7 ppm

Mcl: 0.7 ppm

Ethylbenzene Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**47,293**	**714,580**
Top Ten States		
TX	9,870	480,164
VI	1,233	72,245
IL	31	44,789
PR	0	23,980
VA	17,997	1,950
DE	3,460	13,324
NJ	1,892	11,510
NM	0	13,076
WY	250	12,755
LA	4,383	4,552
Major Industries		
Petroleum refining	55,201	718,884
Plastics, resins	12,384	9,212
Indust. Organics	10,683	9,781
Pharmaceuticals	14,090	0
Metal containers	0	11,510

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

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Consumer Factsheet on: ETHYLENE DIBROMIDE

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This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is EDB and how is it used?

Ethylene dibromide (EDB) is a colorless, heavy organic liquid with a mildly sweet chloroform-like odor. Ethylene dibromide is mainly used in anti-knock gasoline mixtures, particularly in aviation fuel. Other uses include: as a solvent for resins, gums, and waxes; in waterproofing preparations; in making dyes and drugs; and as a pesticide for grains and fruit.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

EDB
Glycol dibromide
Bromofume
Dowfume W 85
Aadibroom
Iscobrome-D
Nefis
Pestmaster
EDB-85
Soilbrom
Soilfume

Kopfume

Why is EDB being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for EDB has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.05 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found EDB to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: damage to the liver, stomach, and adrenal glands, along with significant reproductive system toxicity, particularly the testes.

Long-term: EDB has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to the respiratory system, nervous system, liver, heart, and kidneys; cancer.

How much EDB is produced and released to the environment?

EDB is released during the use, storage, and transport of leaded gasoline, as well as during any spills; from its former use as a pesticide; wastewater and emissions from processes and waste waters of the chemical industries that use it.

From 1987 to 1993, according to the Toxics Release Inventory EDB releases to land and water totalled over 3,000 lbs. These releases were primarily from petroleum refineries. The largest of these releases occurred in California and Missouri.

What happens to EDB when it is released to the environment?

When spilled on land or applied to land during soil fumigation, ethylene dibromide may leach to groundwater. Its persistence can vary greatly from soil to soil, from a few weeks to as much as 19 years.

EDB released to water will mainly evaporate. It can be degraded by microbes and chemical reaction in some types of groundwater. It does not tend to accumulate in aquatic life.

How will EDB be Detected in and Removed from My Drinking Water?

Yhe regulation for EDB became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if EDB is present above 0.01 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of EDB so that it is consistently below that level. The following treatment methods have been approved by EPA for removing EDB: Granular activated charcoal.

How will I know if EDB is in my drinking water?

If the levels of EDB exceed the MCL, 0.05 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 0.05 ppb

EDB Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	2,554	2,670

Top Six States

CA	500	
MS	500	
HI	750	
NJ	700	
TX	466	
PR	500	

Top Industrial Sources	
Petroleum refining	1,716
Industrial organic	700
chemicals, fertilizers	

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Consumer Factsheet on: GLYPHOSATE

List of Contaminants

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National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Glyphosate and how is it used?

Glyphosate is an organic solid of odorless white crystals. It is a non-selective herbicide used on many food and non-food crops as well as non-crop areas such as roadsides. When applied at lower rates, it serves as a plant growth regulator. The most common uses include control of broadleaf weeds and grasses in: hay/pasture, soybeans, field corn; ornamentals, lawns, turf, forest plantings, greenhouses, rights-of-way.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Glialka
Roundup
Sting
Rodeo
Spasor
Muster
Tumbleweed
Sonic
Glifonox
Glycel

Rondo

Why is Glyphosate being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for glyphosate has been set at 0.7 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.7 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found glyphosate to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: congestion of the lungs; increased breathing rate.

Long-term: Glyphosate has the potential to cause the following effects from a lifetime exposure at levels above the MCL: kidney damage, reproductive effects.

How much Glyphosate is produced and released to the environment?

Glyphosate is released to the environment in its use as a herbicide for controlling woody and herbaceous weeds on forestry, right-of-way, cropped and non-cropped sites. These sites may be around water and in wetlands.

It may also be released to the environment during its manufacture, formulation, transport, storage, disposal and cleanup, and from spills. Glyphosate is among the most widely used pesticides by volume. Usage in 1990 was estimated to be 11,595,000 pounds. It ranked eleventh among conventional pesticides in the US during 1990-91. In recent years, 13 to 20 million acres were treated with 18.7 million lbs. annually.

What happens to Glyphosate when it is released to the environment?

Glyphosate is strongly adsorbed to soil, with little potential for leaching to ground water. Microbes in the soil readily and completely degrade it even under low temperature conditions. It tends to adhere to sediments when released to water. Glyphosate does not tend to accumulate in aquatic life.

How will Glyphosate be Detected in and Removed from My Drinking Water?

The regulation for glyphosate became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if glyphosate is present above 6 parts per billion. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of glyphosate so that it is consistently below that level. The following treatment methods have been approved by EPA for removing glyphosate: Granular activated charcoal.

How will I know if Glyphosate is in my drinking water?

If the levels of glyphosate exceed the MCL, 0.7 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.7 ppm

Mcl: 0.7 ppm

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Consumer Factsheet on: HEPTACHLOR AND HEPTACHLOR EPOXIDE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Heptachlor and how is it used?

Heptachlor is a white to tan waxy organic solid with a camphor-like odor. The epoxide is formed from heptachlor in the environment. It was once used as a non-agricultural insecticide. Most uses of the product were canceled in 1978. The only permitted commercial use of heptachlor products is for fire ant control in buried, pad-mounted electric power transformers, and in underground cable television and telephone cable boxes.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Aahepta
Agroceres
Hepta
Heptachlordane
Heptagran
Heptamul

Heptox
Gold Crest H-60
Rhodiachlor
Velsicol 104
Basaklor
Soleptax
Termide

Why is Heptachlor being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLGs for heptachlor and its epoxide have been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on these MCLGs, EPA has set enforceable standards called Maximum Contaminant Levels (MCLs). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL for heptachlor has been set at 0.4 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water. The MCL for the epoxide is 0.2 ppb.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found heptachlor and its epoxide to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: liver and central nervous system damage.

Long-term: Heptachlor and its epoxide have the potential to cause the following effects from a lifetime exposure at levels above the MCL: extensive liver damage; cancer.

How much Heptachlor is produced and released to the environment?

Heptachlor may be released directly to the soil in connection with its use in termite and fire ant control. However, heptachlor has been found in treated wastewater from some types of industrial facilities. Production of heptachlor in 1982 was nearly 100,000 lbs.

Heptachlor epoxide is not produced commercially, but rather is formed by the chemical and biological transformation of heptachlor in the environment.

What happens to Heptachlor when it is released to the environment?

Heptachlor can evaporate from soil surfaces, and is degraded by bacteria once it passes into the soil. Heptachlor is expected to adsorb strongly to soil and so resist leaching to groundwater.

Heptachlor epoxide also adsorbs strongly to soil but is extremely resistant to biodegradation, persisting for many years in the upper soil layers. Similarly in water, heptachlor will be broken down while the epoxide will persist, usually in sediments.

Heptachlor epoxide is concentrated extensively in aquatic life. It is taken up into the food chain by plants and bioconcentrates into fish, animals and milk.

How will Heptachlor be Detected in and Removed from My Drinking Water?

The regulation for heptachlor became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if heptachlor is present above 0.04 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of heptachlor so that it is consistently below that level. The following treatment methods have been approved by EPA for removing heptachlor: Granular activated charcoal.

How will I know if Heptachlor is in my drinking water?

If the levels of heptachlor exceed the MCL, 0.4 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mcl

Heptachlor- 0.4 ppb

Heptachlor epoxide- 0.2 ppb

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Consumer Factsheet on: HEXACHLOROBENZENE

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National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is HCB and how is it used?

Hexachlorobenzene (HCB) is an organic solid of white crystalline needles. It is produced as a by-product from the manufacture of a variety of other regulated organic chemicals. It is also a contaminant in the production of some pesticides. The greatest use of HCB is in making other organic compounds such as rubber, dyes, wood preservatives. Other uses of include: as a fungicide on grains, especially wheat.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Hexa CB
HCB
Phenyl perchloryl
Perchlorobenzene
Pentachlorophenyl chloride
Anticarie
Bunt-cure
Co-op hexa
Julin's carbon chloride
No bunt 40

No bunt 80
Sanocide
Snieciotox
Smut-go
Granox nm
Voronit C

Why is HCB being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for HCB has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 1 part per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found HCB to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: skin lesions, nerve and liver damage.

Long-term: HCB has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to liver and kidneys; reproductive effects; benign tumors of endocrine glands; cancer.

How much HCB is produced and released to the environment?

In 1982, imports were reported to be 38,000 lbs, with no evidence of commercial domestic production. However, 2 to 5 million lbs may be generated each year as a waste by-product of chlorination processes in chemical manufacture.

Major environmental releases of HCB are due to air and water discharges from its production as a by-product of chemical manufacture, or from pesticide applications. It is also released by some waste incineration processes. It has been detected in treated waste water from non-ferrous metal manufacturing.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, HCB releases to land and water totalled 1,287 lbs., all of which was to water. These releases were primarily from alkali, chlorine and agricultural chemical industries. The largest releases occurred in Louisiana and Texas.

What happens to HCB when it is released to the environment?

HCB is a very persistent environmental chemical due to its chemical stability and resistance to break down by microbes in soil or water. HCB strongly to soils and to lake and river sediments. It is not likely to migrate through soil to ground water.

Hexachlorobenzene will accumulate in fish. It has been detected in food during market basket surveys.

How will HCB be Detected in and Removed from My Drinking Water?

The regulation for HCB became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if HCB is present above 0.1 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of HCB so that it is consistently below that level. The following treatment methods have been approved by EPA for removing HCB: Granular activated charcoal.

How will I know if HCB is in my drinking water?

If the levels of HCB exceed the MCL, 1 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 1 ppb

HCB Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**1,286**	**1**

Top States		
LA	677	
TX	609	

Major Industries	
Alkalies, chlorine	854
Agricultural chemicals	297

Learn more about your drinking water!

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Your state Department of Health/Environment is also a valuable source of information.

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Consumer Factsheet on: HEXACHLOROCYCLOPENTADIENE

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is HEX and how is it used?

Hexachlorocyclopentadiene (HEX) is an oily, yellow-green organic liquid with a pungent odor. Its greatest use is as a raw material in manufacturing other chemicals, including pesticides, flame retardants, resins, dyes, pharmaceuticals, plastics, etc. HEX has no end uses of its own.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

HEX
Hexachloropentadiene

Why is HEX being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for HEX has been set at 50 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 50 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found HEX to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: gastrointestinal distress; damage to liver, kidneys and heart.

Long-term: HEX has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to the stomach and kidneys.

How much HEX is produced and released to the environment?

It has been estimated that between 8 and 15 million lbs. of HEX are produced each year. Major sources of its release are emissions and contaminated wastewater from facilities which manufacture or use this compound as a chemical intermediate, and from the application of pesticides where it may remain as an impurity. From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, HEX releases to land and water totalled only 78 lbs., all of which was to water. These releases were primarily from alkalis and chlorine industries. The largest releases occurred in New York.

What happens to HEX when it is released to the environment?

HEX is not a persistent environmental contaminant. If released to soil, it is likely to adhere to soil where it will be degraded by microbes. In water it evaporates quickly and is attacked by sunlight and other reactive chemicals. Its tendency to accumulate in aquatic life varies greatly from one species to another.

How will HEX be Detected in and Removed from My Drinking Water?

The regulation for HEX became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if HEX is present above 0.2 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of HEX so that it is consistently below that level. The following treatment methods have been approved by EPA for removing HEX: Granular activated charcoal combined with Packed tower aeration.

How will I know if HEX is in my drinking water?

If the levels of HEX exceed the MCL, 50 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 50 ppb

Mcl: 50 ppb

Learn more about your drinking water!

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Consumer Factsheet on: LINDANE

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National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Lindane and how is it used?

Lindane is a white crystalline organic solid. Most uses being restricted in 1983, lindane is currently used primarily for treating wood-inhabiting beetles and seeds. It is also used as a dip for fleas and lice on pets, and livestock, for soil treatment, on the foliage of fruit and nut trees, vegetables, timber, ornamentals and for wood protection.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

gamma-Hexachlorocyclohexane
Exagamma
Forlin
Gallogamma
Gammaphex
Inexit
Kwell
Lindagranox
Lindaterra
Lovigram
Silvanol

Why is Lindane being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for lindane has been set at 0.2 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.2 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found lindane to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: high body temperature and pulmonary edema.

Long-term: Lindane has the potential to cause the following effects from a lifetime exposure at levels above the MCL: liver and kidney damage.

How much Lindane is produced and released to the environment?

Lindane enters surface water as a result of runoff from agricultural land and from home and garden applications where it is used as an insecticide.

From 1987 to 1993, according to EPA's Toxics Release Inventory, lindane releases to land and water totalled 1115 lbs.

What happens to Lindane when it is released to the environment?

When released to water, lindane is not broken down by microbes, but it is attacked by chemicals in basic waters. It is degraded by soil microbes, and may evaporate from the surface, or slowly leach to ground water. Lindane will accumulate slightly in fish and shellfish.

How will Lindane be Detected in and Removed from My Drinking Water?

The regulation for lindane became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if lindane is present above 0.02 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of lindane so that it is consistently below that level. The following treatment methods have been approved by EPA for removing lindane: Granular activated charcoal.

How will I know if Lindane is in my drinking water?

If the levels of lindane exceed the MCL, 0.2 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.2 ppb

Mcl: 0.2 ppb

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Consumer Factsheet on: METHOXYCHLOR

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Methoxychlor and how is it used?

Methoxychlor is a colorless organic solid with a slightly fruity odor. It is an insecticide preferred to DDT for use on animals, in animal feed, and on DDT-sensitive crops such as squash, melons, etc. Since methoxychlor is more unstable than DDT, it has less residual effect. It has been used extensively in Canada for the control of biting flies, and is also effective against mosquitoes and houseflies.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Dimethoxy-DDT
Methoxy-DDT
Chemform
Maralate
Methoxo
Methoxcide
Metox
Moxie

Why is Methoxychlor being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for methoxychlor has been set at 40 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 40 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found methoxychlor to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: central nervous system depression, diarrhea, and damage to liver, kidney and heart tissue.

Long-term: Methoxychlor has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to liver, kidney and heart tissue; retards growth.

How much Methoxychlor is produced and released to the environment?

Production of methoxychlor has decreased: from 3.7 million lbs. in 1978 to 700,000 lbs in 1982. Release of methoxychlor to the environment occurs due to its use as an insecticide and from losses during the manufacture, formulation, packaging, and disposal of methoxychlor.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, methoxychlor releases to land and water totalled only about 2000 lbs.

What happens to Methoxychlor when it is released to the environment?

Methoxychlor does not tend to persist when released to soil or water. If released to soil, methoxychlor will adhere to soils, though some may leach into groundwater as suggested by the detection of methoxychlor in some groundwater samples. It is broken down by soil and sediment microbes under some conditions. In water, methoxychlor degrades quite rapidly - within days compared to months as in soil. It may accumulate in some shellfish, but not in fish.

How will Methoxychlor be Detected in and Removed from My Drinking Water?

The regulation for methoxychlor became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if methoxychlor is present above 0.1 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of methoxychlor so that it is consistently below that level. The following treatment methods have been approved by EPA for removing methoxychlor: Granular activated charcoal.

How will I know if Methoxychlor is in my drinking water?

If the levels of methoxychlor exceed the MCL, 40 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 40 ppb

Mcl: 40 ppb

Learn more about your drinking water!

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government listings are a good starting point.

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Consumer Factsheet on: OXAMYL (VYDATE)

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National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Oxamyl and how is it used?

Oxamyl is a white crystalline organic solid with a slight sulfurous odor. It is widely used for control of insects, mites and nematodes on field crops, fruits and ornamentals. The majority of oxamyl is applied to apples, potatoes, and tomatoes.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Vydate K
Thioxamyl
Dioxamyl
DPX 1410
Dupont 1410

Why is Oxamyl being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for oxamyl has been set at 0.2 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.2 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found oxamyl to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: tremors, salivation and tearing due to interference with nerve function.

Long-term: Oxamyl has the potential to cause the following effects from a lifetime exposure at levels above the MCL: decreased body weight.

How much Oxamyl is produced and released to the environment?

Oxamyl is released directly to the environment in its use as an insecticide and during its manufacture, handling and storage. EPA estimated that 400,000 lbs. of oxamyl were produced in the US in 1982.

What happens to Oxamyl when it is released to the environment?

Oxamyl is highly soluble in water, and is relatively stable in acidic waters. Otherwise it is readily broken down. Degradation is also rapid in soils which makes it unlikely that oxamyl will leach to ground water. Accumulation in aquatic life is not expected as oxamyl is rapidly absorbed, metabolized and eliminated in toxicological tests.

How will Oxamyl be Detected in and Removed from My Drinking Water?

The regulation for oxamyl became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if oxamyl is present above 2 parts per billion. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of oxamyl so that it is consistently below that level. The following treatment methods have been approved by EPA for removing oxamyl: Granular activated charcoal.

How will I know if Oxamyl is in my drinking water?

If the levels of oxamyl exceed the MCL, 0.2 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.2 ppm

Mcl: 0.2 ppm

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Consumer Factsheet on: POLYCHLORINATED BIPHENYLS

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National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What are PCBs and how are they used?

Polychlorinated biphenyls (PCBs) are a group of organic chemicals which can be odorless or mildly aromatic solids or oily liquids. They were formerly used in the USA as hydraulic fluids, plasticizers, adhesives, fire retardants, way extenders, de-dusting agents, pesticide extenders, inks, lubricants, cutting oils, in heat transfer systems, carbonless reproducing paper.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

PCB
Chlorinated diphenyl
Clophen
Kanechlor
Aroclor
Fenclor
Chlorextol
Dykanol

Inerteen
Monter
Pyralene
Santotherm
Sovol
Therminol
Noflamol

Why are PCBs being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for PCBs has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.5 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found PCBs to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: acne-like eruptions and pigmentation of the skin; hearing and vision problems; spasms.

Long-term: PCBs has the potential to cause the following effects from a lifetime exposure at levels above the MCL: effects similar to acute poisonings; irritation of nose, throat and gastrointestinal tracts; changes in liver function; cancer.

How much PCBs are produced and released to the environment?

Production of PCBs has decreased drastically: from over 86 million lbs. in 1970 to 35 million lbs in 1977. Since EPA banned most uses of

PCBs in 1979, current releases are due mainly to the cycling of this persistent contaminant from soil to air to soil again. PCBs are also currently released from landfills, incineration of municipal refuse and sewage sludge, and improper (or illegal) disposal of PCB materials, such as waste transformer fluid, to open areas.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, PCB releases to land and water totalled over 74,000 lbs. The bulk of these releases occurred in 1990 and were primarily from non-ferrous wire drawing and insulating industries. The largest releases occurred in California.

What happens to PCBs when they are released to the environment?

PCBs are very persistent in soil and water, with no known break down processes other than slow degradation by microbes. They adhere to soils or evaporate, and so will not usually leach to ground water. PCB-contaminated sediments in lakes or rivers can slowly release PCB back into water, from which it eventually evaporates.

How will PCBs be Detected in and Removed from My Drinking Water?

The regulation for PCBs became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if PCBs are present above some lowest detectable level. If it is present above this level, which differs for each type of PCB, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of PCBs so that it is consistently below that level. The following treatment methods have been approved by EPA for removing PCBs: Granular activated charcoal.

How will I know if PCBs are in my drinking water?

If the levels of PCBs exceed the MCL, 0.5 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 0.5 ppb

PCB Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**784**	**73,632**

Top Five States		
CA	7	58,178
NJ	0	13,188
KY	250	750
WA	0	998
TN	255	251

Major Industries		
Non-ferrous wire	0	58,178
Steel pipe/tubing	0	13,183
Pulp mills	0	998

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Consumer Factsheet on: PENTACHLOROPHENOL

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National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Pentachlorophenol and how is it used?

Pentachlorophenol (PCP) is a white organic solid with needle-like crystals and a phenolic odor. The greatest use of pentachlorophenol is as a wood preservative (fungicide). Though once widely used as an herbicide, it was banned in 1987 for these and other uses, as well as for any over-the-counter sales.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

PCP
Penchlorol
Dowicide 7
Permasan
Fungifen
Grundier arbezol
Lauxtol
Liroprem
Chlon
Dura Treet II

Santophen 20
Woodtreat
Penta Ready
Penta WR
Forpen-50
Ontrack WE Herbicide
Ortho Triox
Osmose WPC
Watershed WP
Weed and Brush KillerH

Why is Pentachlorophenol being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for pentachlorophenol has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 1 part per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found pentachlorophenol to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: damage to the central nervous system

Long-term: Pentachlorophenol has the potential to cause the following effects from a lifetime exposure at levels above the MCL: reproductive effects and damage to liver and kidneys; cancer.

How much Pentachlorophenol is produced and released to the environment?

Production of pentachlorophenol was 45 million lbs in 1983. It may be released to the environment as a result of its manufacture, storage, transport, or use as an industrial wood preservative. From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, releases to land and water totalled nearly 100,000 lbs.

The most widespread releases were primarily from wood preserving industries in many states. However, the greatest volume of releases occurred at a military munitions plant in Nevada.

What happens to Pentachlorophenol when it is released to the environment?

When released to soil or water, PCP will be slowly broken down by microbes and may gradually leach into ground water. If released in water, it will adsorb to sediment, or be degraded by sunlight. Its accumulation in fish will be moderate.

How will Pentachlorophenol be Detected in and Removed from My Drinking Water?

The regulation for pentachlorophenol became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if pentachlorophenol is present above 0.04 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of pentachlorophenol so that it is consistently below that level. The following treatment methods have been approved by EPA for removing pentachlorophenol: Granular activated charcoal.

How will I know if Pentachlorophenol is in my drinking water?

If the levels of pentachlorophenol exceed the MCL, 1 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 1 ppb

Pentachlorophenol Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**18,700**	**79,780**

Top Five States		
NV	0	64,100
OR	4,313	5,405
WA	3,310	5,995
AR	2,735	1,615
GA	783	1,255

Major Industries	
Explosives	34,100
Wood preserving	15,678
Misc. Chemicals	30,000

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

EPA strongly encourages people to learn more about their drinking water, and to support local efforts to protect and upgrade the supply of safe drinking water. Your water bill or telephone book's government listings are a good starting point.

Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPA's Safe Drinking Water Hotline: (800) 426-4791.

For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346

Consumer Factsheet on: PICLORAM

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Picloram and how is it used?

Picloram is a crystalline organic solid with a chlorine-like odor. It is used in salt form as a systemic herbicide for controlling annual weeds on crops, and in combination with 2,4-D or 2,4,5-T against perennials on non-croplands for brush control. Picloram is used to control bitterweed, knapweed, leafy spurge, locoweed, larkspur, mesquite, prickly pear, and snakeweed on rangeland in the western states.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

"Agent White"
Tordon

Why is Picloram being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for picloram has been set at 0.5 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 0.5 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found picloram to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: damage to central nervous system, weakness, diarrhea, weight loss.

Long-term: Picloram has the potential to cause the following effects from a lifetime exposure at levels above the MCL: liver damage.

How much Picloram is produced and released to the environment?

EPA estimates that 300,000 lbs. of picloram were produced in the US in 1982.

Picloram is released to the environment primarily from its application as a herbicide, and also during its production and handling.

What happens to Picloram when it is released to the environment?

Picloram is the most persistent of its family of herbicides. It does not adhere to soil and so may leach to groundwater, and has in fact been detected there. It is degraded in soil and water mainly by microbes. Picloram has very little tendency to accumulate in aquatic life.

How will Picloram be Detected in and Removed from My Drinking Water?

The regulation for picloram became effective in 1994. Between 1993 nd 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if picloram is present above 0.1 part per billion. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of picloram so that it is consistently below that level. The following treatment methods have been approved by EPA for removing picloram: Granular activated charcoal.

How will I know if Picloram is in my drinking water?

If the levels of picloram exceed the MCL, 0.5 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.5 ppm

Mcl: 0.5 ppm

Learn more about your drinking water!

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Consumer Factsheet on: SIMAZINE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Simazine and how is it used?

Simazine is an organic white solid, used as a pre-emergence herbicide used for control of broad-leaved and grassy weeds on a variety of deep-rooted crops such as artichokes, asparagus, berry crops, broad beans, citrus, etc., and on non-crop areas such as farm ponds and fish hatcheries. Its major use is on corn where it is often combined with AAtrex. Other herbicides with which simazine is combined include: paraquat, on apples, peaches; Roundup or Oust for noncrop use; Surflan on Christmas trees; Dual on corn and ornamentals.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Aktinit
Batazina
Bitemol
CAT(Herbicide)
CDT
Cekuzina-S
Geigy 27,692
Gesatop

Herbazin
Herbex
Hungazin
Premazine
Primatol S
Pricep
Printop
Radocon
Simadex
Tafazine
Zeapur

Why is Simazine being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for simazine has been set at 4 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 4 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found simazine to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: weight loss, changes in blood.

Long-term: Simazine has the potential to cause the following effects from a lifetime exposure at levels above the MCL: tremors; damage to testes, kidneys, liver and thyroid; gene mutations; cancer.

How much Simazine is produced and released to the environment?

The amount of simazine used annually in the USA was estimated in 1985 to be 4.8 billion pounds. Simazine may be released into the environment via effluent at manufacturing sites and at points of application where it is employed as a herbicide.

What happens to Simazine when it is released to the environment?

If released to water, simazine will not bind to sediments or evaporate. It may leach to ground water. Its persistence varies from a few months to a few years, depending mainly on the rate of degradation by microbes. Simazine has a low potential to bioaccumulate in fish.

How will Simazine be Detected in and Removed from My Drinking Water?

The regulation for simazine became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if simazine is present above 0.07 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of simazine so that it is consistently below that level. The following treatment methods have been approved by EPA for removing simazine: Granular activated charcoal.

How will I know if Simazine is in my drinking water?

If the levels of simazine exceed the MCL, 4 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 4 ppb

Mcl: 4 ppb

Learn more about your drinking water!

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Consumer Factsheet on: STYRENE

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Styrene and how is it used?

Styrene is an oily organic liquid with an aromatic, almost floral odor. Initially, styrene was used primarily in the synthetic rubber industry, but it is currently used as a building block for polymers in making plastics, resins, coatings, and paints.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Vinyl benzene
Phenethylene
Cinnamene
Diarex HF 77
Styrolene
Styrol
Styropol

Why is Styrene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for styrene has been set at 0.1 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.1 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found styrene to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: nervous system effects such as depression, loss of concentration, weakness, fatigue and nausea.

Long-term: Styrene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: liver and nerve tissue damage; cancer.

How much Styrene is produced and released to the environment?

Production of styrene was 10.7 billion lbs in 1993. It is released into the environment by emissions and effluents from its production and its use in polymer manufacture. Consumers may be exposed to styrene through contact with resin products used in fiberglass boat construction and repair, and in auto body fillers. Styrene may also leach from polystyrene containers used for food products.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, styrene releases to land and water totalled over 2 million lbs. These releases were primarily from adhesives and sealants industries. The largest releases occurred in Texas. The largest direct releases to water occurred in Louisiana.

What happens to Styrene when it is released to the environment?

Styrene released to water rapidly evaporates and is degraded by microbes. It does not bind well to soils and may leach to groundwater, but its rapid break down minimizes this process. It does not tend to accumulate in aquatic life.

How will Styrene be Detected in and Removed from My Drinking Water?

The regulation for styrene became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if styrene is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of styrene so that it is consistently below that level. The following treatment methods have been approved by EPA for removing styrene: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if Styrene is in my drinking water?

If the levels of styrene exceed the MCL, 0.1 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.1 ppm

Mcl: 0.1 ppm

Styrene Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**275,888**	**1,796,451**

Top Ten States*

TX	160,411	572,294
WV	1,600	555,360
IN	0	124,794
WI	0	102,973
OH	0	90,358
GA	0	79,000
LA	53,430	0
FL	0	38,800
NY	32	33,192
KY	0	18,000

Major Industries*

Adhesives, sealants	0	537,360
Concrete products	0	398,424
Synthetic rubber	152,215	149,147
Misc. plastic products	515	201,713
Plastics and resins	25,133	71,363
Boatbuilding, repair	220	83,256
Car parts, access.	0	79,250
Misc. Indust. organics	34,275	43,290
Travel trailers, campers	0	45,129
Custom plastic resins	720	44,320

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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Your state Department of Health/Environment is also a valuable source of information.

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Consumer Factsheet on: TETRACHLOROETHYLENE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Tetrachloroethylene and how is it used?

Tetrachloroethylene (PCE) is a colorless organic liquid with a mild, chloroform-like odor. Its greatest use is in the textile industry, and as a component of aerosol dry-cleaning products.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Ethylene tetrachloride
Perchloroethylene
PCE
Ankilostin
Didakene
Fedal-un
Nema
Perclene
Persec
Tetlen
Tetracap
Tetraleno
Tetropil
Antisal 1
Dow-per
Perawin
Perchlor

Percosolv
Perk
Perklone
Tetraguer
Tetralex
Tetravec

Why is Tetrachloroethylene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for PCE has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 5 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver and may have an increased risk of getting cancer.

How much Tetrachloroethylene is produced and released to the environment?

Production of tetrachloroethylene was 405 million lbs in 1986. Major releases of tetrachloroethylene to air and water are from dry cleaning and industrial metal cleaning or finishing. Water pollution can occur from tetrachloroethylene leaching from vinyl liners in some types of pipelines used for water distribution, and during chlorination water treatment.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, tetrachloroethylene releases to land and water totalled over 1 million lbs. These releases were primarily from alkali and chlorine industries which use it to make other chemicals. The largest releases occurred in Louisiana and South Carolina.

What happens to Tetrachloroethylene when it is released to the environment?

PCE released to soil will readily evaporate or may leach slowly to the groundwater. Its break down by soil microbes is slow. PCE released to water will primarily evaporate and has little potential for accumulating in aquatic life.

How will Tetrachloroethylene be Detected in and Removed from My Drinking

Water?

The regulation for tetrachloroethylene became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if PCE is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant until the system has taken immediate steps to remediate the problem or the State has determined that the contaminant will remain reliably and consistently below the MCL.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of PCE so that it is consistently below that level. The following treatment methods have been approved by EPA for removing PCE: Granular activated carbon in combination with Packed Tower Aeration.

How will I know if Tetrachloroethylene is in my drinking water?

If the levels of PCE exceed the MCL, 5 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 5 ppb

Tetrachloroethylene Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**297,602**	**750,104**
Top Ten States*		
LA	23,639	610,518
SC	104,728	0
NH	62,150	0
NC	42,192	13,102
IL	0	40,500
TX	36,144	720
OH	0	32,170
IN	1,300	27,000
CO	0	11,000
IA	5,112	0
Major Industries*		
Alkalis, chlorine	63,472	611,242
Leather tanning,finishing	62,150	0
Cotton fabric finishing	51,577	0
Misc textile finishing	48,082	2,000
Knit outwear mills	45,808	0
Misc. apparel, access.	0	40,500
Transportation Equip.	3,750	27,000
Ammunition	0	20,575
Misc Chem. preparations	0	11,102

Petroleum refining	0	11,000
Ordnance, accessories	0	10,100

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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Consumer Factsheet on: TOLUENE

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Toluene and how is it used?

Toluene is an organic liquid with a sweet, benzene-like odor. The largest chemical use for toluene is to make benzene and urethane.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Methylbenzene
Methacide
Phenylmethane
Toluol
Antisal 1A

Why is Toluene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for toluene has been set at 1 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible,

considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has also been set at 1 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found toluene to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: minor nervous system disorders such as fatigue, nausea, weakness, confusion.

Long-term: Toluene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: more pronounced nervous disorders such as spasms, tremors, impairment of speech, hearing, vision, memory, coordination; liver and kidney damage.

How much Toluene is produced and released to the environment?

Production of toluene was 6.4 billion lbs in 1993. It is released into the atmosphere principally from the volatilization of petroleum fuels and toluene-based solvents and thinners and from motor vehicle exhaust. It is also released in wastewaters or by spills on land during the storage, transport and disposal of fuels and oils.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, toluene releases to land and water totalled over 4 million lbs., primarily from petroleum refining industries. The largest releases occurred in Texas and California. The largest releases directly to water occurred in Connecticut and West Virginia.

What happens to Toluene when it is released to the environment?

Toluene released to soil will be lost by evaporation from near-surface soil and by leaching to the groundwater. Its breakdown by soil microbes is slow. Toluene evaporates within a few hours when released to water, and it has little tendency to accumulate in aquatic life.

How will Toluene be Detected in and Removed from My Drinking Water?

The regulation for toluene became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if toluene is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of toluene so that it is consistently below that level. The following treatment methods have been approved by EPA for removing toluene: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if Toluene is in my drinking water?

If the levels of toluene exceed the MCL, 1 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 1 ppm

Mcl: 1 ppm

Toluene Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS* (in pounds)	**732,310**	**3,672,041**
Top Ten States*		
TX	16,285	969,210
CA	0	930,000
CT	316,068	0
OK	0	287,000
VA	27,500	216,000
VI	2,970	191,504
IL	56	180,824
MI	0	129,226
WV	117,523	1,377
SC	6,000	89,578
Major Industries*		
Petroleum refining	227,196	2,580,941
Medicinals, botanicals	301,585	1,108
Petroleum/coal prods.	38,856	287,000
Misc Ind. Chemicals	179,576	107,159
Gaskets, sealing devices	4,002	216,000
Wood office furniture	0	129,226
Plastics, resins	57,661	39,139
Wood home furniture	30,000	65,444
Paints, allied products	5,927	88,024

* Water/Land totals only include facilities with releases greater than 10,000 lbs.

Learn more about your drinking water!

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Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: TOXAPHENE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard setby the United States Environmental Protection Agency (EPA).

What is Toxaphene and how is it used?

Toxaphene is an amber, waxy organic solid with a piney odor. Toxaphene was used as an insecticide for cotton and vegetables, and on livestock and poultry. These uses have been restricted, and toxaphene is now used only for special needs, mainly in southern states.

The list of trade names given below may help you find out whetheryou are using this chemical at home or work.

Trade Names and Synonyms:

Chlorinated camphene
Octachlorocamphene
Camphochlor
Agricide Maggot Killer
Alltex
Crestoxo
Compound 3956
Estonox
Fasco-Terpene
Geniphene
Hercules 3956
M5055

Melipax
Motox
Penphene
Phenacide
Phenatox
Strobane-T
Toxadust
Toxakil
Vertac 90%
Toxon 63
Attac
Anatox
Royal Brand Bean Tox 82
Cotton Tox MP82
Security Tox-Sol-6
Security Tox-MP cotton spray
Security Motox 63 cotton spray
Agro-Chem Brand Torbidan 28
Dr Roger's TOXENE

Why is Toxaphene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for toxaphene has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 3 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found toxaphene to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: central nervous system effects including restlessness, hyperexcitability, tremors, spasms or convulsions.

Long-term: Toxaphene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: liver and kidney degeneration; central nervous system effects; possible immune system suppression; cancer.

How much Toxaphene is produced and released to the environment?

Production of toxaphene in 1977 was nearly 40 million pounds. By 1982, when EPA canceled most of its uses, consumption was reported at 12 million pounds. Toxaphene is released into the environment primarily from its application as an insecticide for the protection of cotton, mostly in southern states.

What happens to Toxaphene when it is released to the environment?

Toxaphene is very persistent, remaining in soil for up to 14 years. It is not expected to leach to groundwater. It will not break down by microbial or other means. Though it strongly binds to soils and the sediments of water bodies, it may gradually evaporate to the air where it is slowly broken down by sunlight. Toxaphene has a high potential to accumulate in aquatic life.

How will Toxaphene be Detected in and Removed from My Drinking Water?

The regulation for toxaphene became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if toxaphene is present above 1 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of toxaphene so that it is consistently below that level. The following treatment methods have been approved by EPA for removing toxaphene: Granular activated charcoal.

How will I know if Toxaphene is in my drinking water?

If the levels of toxaphene exceed the MCL, 3 ppb, the system must notify the public via newspapers, radio, TV and other means.

Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 3 ppb

Learn more about your drinking water!

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Consumer Factsheet on: 2,4,5-TP (SILVEX)

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Silvex and how is it used?

2,4,5-TP is a white organic powder with little odor. Its use has been banned since 1985. The greatest use of 2,4,5-TP was as a postemergence herbicide for control of woody plants, and broadleaf herbaceous weeds in rice and bluegrass turf, in sugarcane, in rangeland improvement programs, on lawns. Aquatic uses included control of weeds in ditches and riverbanks, on floodways, along canals, reservoirs, streams, and along southern waterways.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Weed-B-Gon
Propon
Silvi-Rhap
Sta-fast
Miller Nu Set
Aqua-Vex
Color-Set
Ded-Weed
Fenoprop
Fenormone

Fruitone T
Garlon
Kuran
Kurosal G/SL
Silvex

Why is Silvex being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for 2,4,5-TP has been set at 0.05 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.05 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found 2,4,5-TP to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: depression and other nervous system effects, weakness, stomach irritation and minor damage to liver and kidneys.

Long-term: 2,4,5-TP has the potential to cause the following effects from a lifetime exposure at levels above the MCL: minor liver and kidney damage.

How much Silvex is produced and released to the environment?

In 1982, 2,4,5-TP production was 500,000 pounds. Former releases were from spraying on rangelands, runoff from fields, and direct release to water for control of aquatic weeds.

What happens to Silvex when it is released to the environment?

2,4,5-TP will strongly bind to soils and is degraded by microbes, so it isn't likely to leach to ground water. If released to water, 2,4,5-TP will bind to sediment, where microbes will slowly degradeit. It has a very low potential for accumulating in aquatic life.

How will Silvex be Detected in and Removed from My Drinking Water?

The regulation for 2,4,5-TP became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if 2,4,5-TP is present above 0.2 ppb. If it is present above this evel, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of 2,4,5-TP so that it is consistently below that level. The following treatment methods have been approved by EPA for removing 2,4,5-TP: Granular activated charcoal.

How will I know if Silvex is in my drinking water?

If the levels of 2,4,5-TP exceed the MCL, 0.05 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.05 ppm

Mcl: 0.05 ppm

Learn more about your drinking water!

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is 1,2,4-TCB and how is it used?

1,2,4-Trichlorobenzene (1,2,4-TCB) is an aromatic, colorless organic liquid. The greatest use of 1,2,4-trichlorobenzene is primarily as a dye carrier. It is also used to make herbicides and other organic chemicals; as a solvent; in wood preservatives; in abrasives. It was once used as a soil treatment for termite control.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Hostetex L-PEC
Trichlorobenzol

Why is 1,2,4-TCB being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for 1,2,4-trichlorobenzene has been set at 0.07 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants

using suitable treatment technologies.

The MCL has also been set at 0.07 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found 1,2,4-trichlorobenzene to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: changes in liver, kidneys and adrenal glands

Long-term: 1,2,4-Trichlorobenzene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: increased adrenal gland weights

How much 1,2,4-TCB is produced and released to the environment?

Current production figures on 1,2,4-trichlorobenzene are not available. EPA estimated 1983 production to be in the range of 3 to 8 million lbs., with imports over 3 million lbs. Major environmental releases of 1,2,4-trichlorobenzene are due to its manufacture and use as a dye carrier.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, 1,2,4-trichlorobenzene releases to land and water totalled over 180,000 lbs. These releases were primarily from textile finishing industries. The largest releases occurred in North Carolina and Virginia.

What happens to 1,2,4-TCB when it is released to the environment?

1,2,4-Trichlorobenzene (1,2,4-TCB) binds well to the soil and therefore will not leach appreciably to the groundwater when released to land. However, 1,2,4-TCB has been detected in some groundwater samples which indicates that it can be transported there by some process. If released to water it will largely evaporate within a few hours. It has some potential to accumulate in fish.

How will 1,2,4-TCB be Detected in and Removed from My Drinking Water?

The regulation for 1,2,4-trichlorobenzene became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if 1,2,4-trichlorobenzene is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of 1,2,4-trichlorobenzene so that it is consistently below that level. The following treatment methods have been approved by EPA for removing 1,2,4-trichlorobenzene: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if 1,2,4-TCB is in my drinking water?

If the levels of 1,2,4-trichlorobenzene exceed the MCL, 0.07 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.07 ppm

Mcl: 0.07 ppm

1,2,4-TCB Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**157,541**	**22,835**
Top Five States*		
NC	80,253	13,209
VA	36,970	0
GA	17,639	8,951
WV	20,300	0
NY	1,150	1
Major Industries*		
Finishing plants, misc	52,249	0
Finishing plants, synth.	47,976	0
Weaving, finishing mills	20,139	8,951
Alkalies, chlorine	21,773	1
Knitting mills, misc	9,077	9,994
Knit outerwear mills	1,300	3,200

* Water/Land totals only include facilities with releases greater than 100 lbs.

Learn more about your drinking water!

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Consumer Factsheet on: 1,1,1-TRICHLOROETHANE

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As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is 1,1,1-TCA and how is it used?

1,1,1-Trichloroethane (1,1,1-TCA) is an organic liquid with a chloroform-like odor. It is largely used as a solvent removing grease from machined metal products, in textile processing and dyeing and in aerosols.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Chloroethene
Methylchloroform
Aerothene TT
Algylen
Alpha-T
Chlorten
Gemalgene
Genklene
Dowclene
Solvent 111
Trichloran
Inhibisol

Why is 1,1,1-TCA being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for 1,1,1-TCA has been set at 0.2 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.2 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found 1,1,1-TCA to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: damage to the liver, nervous system and circulatory system.

Long-term: 1,1,1-TCA has the potential to cause the following effects from a lifetime exposure at levels above the MCL: liver, nervous system and circulatory system damage.

How much 1,1,1-TCA is produced and released to the environment?

Demand for 1,1,1-trichloroethane was 705 million lbs. in 1989. 1,1,1-TCA is likely to enter the environment by evaporation or in wastewater from its production or use in metal cleaning. It can also enter the environment in leachates and volatile emissions from landfills.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, releases to water and land totalled over 1 million lbs. These releases were primarily from metal fabrication industries. The largest releases occurred in California and Georgia. The largest direct releases to water occurred in Utah and Indiana.

What happens to 1,1,1-TCA when it is released to the environment?

1,1,1-TCA will evaporate rapidly from water and soil. It does not bind to soils nor is it broken down by microbial action, so it may leach to ground water. It has little tendency to accumulate in aquatic life.

How will 1,1,1-TCA be Detected in and Removed from My Drinking Water?

The regulation for 1,1,1-TCA became effective in 1989. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if 1,1,1-TCA is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water

supplier must take steps to reduce the amount of 1,1,1-TCA so that it is consistently below that level. The following treatment methods have been approved by EPA for removing 1,1,1-TCA: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if 1,1,1-TCA is in my drinking water?

If the levels of 1,1,1-TCA exceed the MCL, 0.2 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 0.2 ppm

Mcl: 0.2 ppm

1,1,1-TCA Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**222,403**	**812,873**
Top Six States*		
CA	0	109,070
GA	0	73,258
AR	0	67,000
IN	15,000	46,096
VA	0	51,822
UT	40,000	0
Major Industries		
Gray iron foundries	1,084	76,158
Aircraft	546	73,258
Manufacturing industries	1,018	72,572
Wood furniture	0	53,038
Fabricated structural metal	0	51,425
Plating, polishing	6,152	41,647
Turbines, generators	40,317	966

* State totals only include facilities with releases greater than 10,000 lbs.

Learn more about your drinking water!

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National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is 1,1,2-TCE and how is it used?

1,1,2-Trichloroethane (1,1,2-TCE) is an organic liquid with a chloroform-like odor. It is only used to make vinylidene chloride which is in turn used to make synthetic fibers and plastic wraps such as the saran wrap.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Beta trichloroethane
Beta-T
Vinyl trichloride

Why is 1,1,2-TCE being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for 1,1,2-TCE has been set at 3 parts per billion (ppb) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants

using suitable treatment technologies.

The MCL has been set at 5 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found 1,1,2-TCE to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: irritation of gastrointestinal tract; red or hemorrhaged lungs; pale liver.

Long-term: 1,1,2-TCE has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to liver and kidneys; cancer.

How much 1,1,2-TCE is produced and released to the environment?

An estimated 124 million lbs. of 1,1,2-TCE was produced in the US during 1974, based on the manufacture of vinylidene chloride. It evaporates during its use in the manufacture of vinylidene chloride and as a solvent. It is also released in wastewater from these uses, and in leachates and volatile emissions from landfills. The EPA estimates the gross annual discharge of 1,1,2-TCE waste in the US to be 4 million lbs.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, 1,1,2-TCE releases to land and water totalled over 30,000 lbs., of which about 98 percent was to water. These releases were primarily from alkali and chlorine industries. The largest releases occurred in Louisiana and Texas.

What happens to 1,1,2-TCE when it is released to the environment?

When released into water, 1,1,2-TCE should primarily evaporate. In soils, it should partially evaporate and partially leach into the groundwater. Its break down by microbes, if it occurs, is very slow. 1,1,2-TCE shows little tendency to accumulate in aquatic life.

How will 1,1,2-TCE be Detected in and Removed from My Drinking Water?

The regulation for 1,1,2-TCE became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if 1,1,2-TCE is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of 1,1,2-TCE so that it is consistently below that level. The following treatment methods have been approved by EPA for removing 1,1,2-TCE: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if 1,1,2-TCE is in my drinking water?

If the levels of 1,1,2-TCE exceed the MCL, 5 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 3 ppb

Mcl: 5 ppb

1,1,2-TCE Releases to Water and Land, 1987 to 1993 (in pounds):

		Water	**Land**
TOTALS (in pounds)		**30,326**	**756**
332			
Top Five States*			
LA	14,481		
TX	9,699	294	
NY	4,570	130	
MD	750	0	
KY	447	0	
Major Industries*			
Alkalies, chlorine		21,783	361
Photograph equipment		4,570	130
Meat packing plants		981	0
Petroleum refining		959	0
Blast furnaces, steelworks		750	0

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

Learn more about your drinking water!

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Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: TRICHLOROETHYLENE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Trichloroethylene and how is it used?

Trichloroethylene is a colorless or blue organic liquid with a chloroform-like odor. The greatest use of trichloroethylene is to remove grease from fabricated metal parts and some textiles.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

1,1,2-Trichloroethylene
Acetylene trichloroethylene
Algylen
Anameth
Benzinol
Chlorilen
CirCosolv
Germalgene
Lethurin
Perm-a-chlor
Petzinol
Philex
TRI-Plus M
Vitran

Why is Trichloroethylene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for trichloroethylene has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 5 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

How much Trichloroethylene is produced and released to the environment?

Production of trichloroethylene has increased from just over 260,000 lbs. in 1981 to 320 million lbs. in 1991. Major environmental releases of trichloroethylene are due to air emissions from metal degreasing plants. Wastewater from metal finishing, paint and ink formulation, electrical/electronic components, and rubber processing industries also may contain trichloroethylene.

From 1987 to 1993, according to the Toxics Release Inventory, trichloroethylene releases to water and land totalled over 291,000 lbs. These releases were primarily from steel pipe and tube manufacturing industries. The largest releases occurred in Pennsylvania and Illinois. The largest direct releases to water occurred in West Virginia.

What happens to Trichloroethylene when it is released to the environment?

Trichloroethylene released to soil will either evaporate or leach into ground water. If released to water, it will also quickly evaporate. It has only a moderate potential to accumulate in aquatic life.

How will Trichloroethylene be Detected in and Removed from My Drinking Water?

The regulation for trichloroethylene became effective in 1989. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if TCE is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant until the system has taken immediate steps to remediate the problem or the State has determined that the contaminant will remain reliably and consistently below the

MCL.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of TCE so that it is consistently below that level. The following treatment methods have been approved by EPA for removing TCE: Granular activated carbon in combination with Packed Tower Aeration.

How will I know if Trichloroethylene is in my drinking water?

If the levels of trichloroethylene exceed the MCL, 5 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 5 ppb

Trichloroethylene Releases to Water and Land, 1987 to 1993 (in pounds):

		Water	Land
	TOTALS (in pounds)	**100,293**	**191,088**
	Top Six States*		
PA	0	33,450	
IL	0	30,711	
GA	3,742	17,532	
TX	0	21,000	
MA	0	19,920	
WV	12,822	0	
	Major Industries		
Steel pipe, tubes		31	39,288
Misc. Indust. Organics		27,708	0
Car parts, access.		4,405	19,920
Plating, polishing		3,342	20,100
Wool fabric mills		3,942	18,081

* State totals only include facilities with releases greater than 10,000 lbs.

Learn more about your drinking water!

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Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

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Consumer Factsheet on: VINYL CHLORIDE

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Vinyl Chloride and how is it used?

Vinyl chloride is a colorless organic gas with a sweet odor. It is used in the manufacture of numerous products in building and construction, automotive industry, electrical wire insulation and cables, piping, industrial and household equipment, medical supplies, and is depended upon heavily by the rubber, paper, and glass industries.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Chlorethene
Chlorethylene
Monochloroethene
Monovinyl chloride (MVC)
Trovidur

Why is Vinyl Chloride being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for vinyl chloride has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 2 parts per billion (ppb) because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found vinyl chloride to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: damage to the nervous system.

Long-term: Vinyl chloride has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to the liver and nervous system; cancer.

How much Vinyl Chloride is produced and released to the environment?

Production of vinyl chloride in 1993 was nearly 14 billion lbs. Its major release to the environment will be as emissions and wastewater at polyvinyl chloride (PVC) plastics production and manufacturing facilities. Small quantities of vinyl chloride can be released to food since it is used to make many food wrappings and containers.

From 1987 to 1993, according to EPA's Toxic Release Inventory, vinyl chloride releases to water and land totalled over 38,000 lbs. These releases were primarily from plastics materials and resins industries. The largest releases occurred in Louisiana and Delaware.

What happens to Vinyl Chloride when it is released to the environment?

Vinyl chloride released to soil will either quickly evaporate, be broken down by microbes or may leach to the groundwater. It also rapidly evaporates from water, but does not degrade there. It will not accumulate in aquatic life.

How will Vinyl Chloride be Detected in and Removed from My Drinking Water?

The regulation for vinyl chloride became effective in 1989. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if vinyl chloride is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of vinyl chloride so that it is consistently below that level. The following treatment methods have been approved by EPA for removing vinyl chloride: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if Vinyl Chloride is in my drinking water?

If the levels of vinyl chloride exceed the MCL, 2 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 2 ppb

Vinyl Chloride Releases to Water and Land, 1987 to 1993 (in pounds):

		Water	Land
TOTALS (in pounds)		**21,693**	**17,038**
	Top Five States		
LA	12,600	0	
DE	86	8,829	
OH	3,360	0	
PA	0	3,290	
SC	0	3,100	
	Major Industries		
Plastics, resins		19,489	13,375

Learn more about your drinking water!

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Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPAs Safe Drinking Water Hotline: (800) 426-4791.

For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346.

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Consumer Factsheet on: XYLENES

List of Contaminants

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Xylene and how is it used?

A xylene is any of a group of very similar organic compounds. They are clear liquids with a sweet odor. The greatest use of xylenes is as a solvent which is much safer than benzene. Other uses include: in gasoline as part of the BTX component (benzene-toluene-xylene); Xylene mixtures are used to make phthalate plasticizers, polyester fiber, film and fabricated items.

The list of trade names given below may help you find out whether you are using this chemical at home or work.

Trade Names and Synonyms:

Dimethyl benzene
Xylol
Methyltoluene
Violet 3

Why is Xylene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for xylenes has been set at 10 parts per million (ppm) because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 10 ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found xylenes to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: disturbances of cognitive abilities, balance, and coordination.

Long-term: Xylenes has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to the central nervous system, liver and kidneys.

How much Xylene is produced and released to the environment?

Production of xylenes was 6.84 billion lbs. in 1993. Major environmental releases of xylenes are due to evaporation from the refining and use of petroleum products. It may also be released by leaks or spills during the transport and storage of gasoline and other fuels. Xylenes are a natural products of many plants, and are a component of petroleum and coal tar.

From 1987 to 1993, according to EPA's Toxic Chemical Release Inventory, xylene releases to land and water totalled nearly 4.8 billion lbs. These releases were primarily from petroleum refining industries. The largest releases occurred in Texas. The largest direct releases to water occurred in New Jersey and Georgia.

What happens to Xylene when it is released to the environment?

Most of the xylenes are released into the atmosphere where they are quickly degraded by sunlight. When released to soil or water, xylenes will quickly evaporate. They may leach into ground water and persist there for several years. There is little potential for accumulation in aquatic life.

How will Xylene be Detected in and Removed from My Drinking Water?

The regulation for xylenes became effective in 1992. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if xylenes is present above 0.5 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of xylenes so that it is consistently below that level. The following treatment methods have been approved by EPA for removing xylenes: Granular activated charcoal in combination with Packed Tower Aeration.

How will I know if Xylene is in my drinking water?

If the levels of xylenes exceed the MCL, 10 ppm, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: 10 ppm

Mcl: 10 ppm

Xylene Releases to Water and Land, 1987 to 1993 (in pounds):

	Water	Land
TOTALS (in pounds)	**875,943**	**3,897,738**
Top Ten States*		
TX	30,853	2,099,734
NJ	294,437	280,759
IL	36	206,990
IN	0	145,079
AL	34,361	59,022
CA	0	91,500
MI	0	86,774
GA	68,310	15,000
VA	50,100	33,000
WA	27,860	52,360
Major Industries*		
Petroleum refining	131,817	2,678,958
Metal barrels, drums	5	289,542
Textile finishing, misc.	278,454	0
Misc. Industrial chems.	95,706	69,696
Extruded Aluminum prod.	1,265	138,798
Furniture, fixtures	0	91,500
Cotton fabric finishing	68,310	15,000
Wood office furniture	0	67,677
Pharmaceuticals	52,285	3,100
Paper mills	52,480	2,122

* Water/Land totals only include facilities with releases greater than a certain amount - usually 1000 to 10,000 lbs.

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United States Environmental Protection Agency | Office of Water (4606) | EPA 816-F-01-003 June 2001

Radionuclides Rule: A Quick Reference Guide

Overview of the Rule

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

Public Health Benefits

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

Regulated Contaminants

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

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

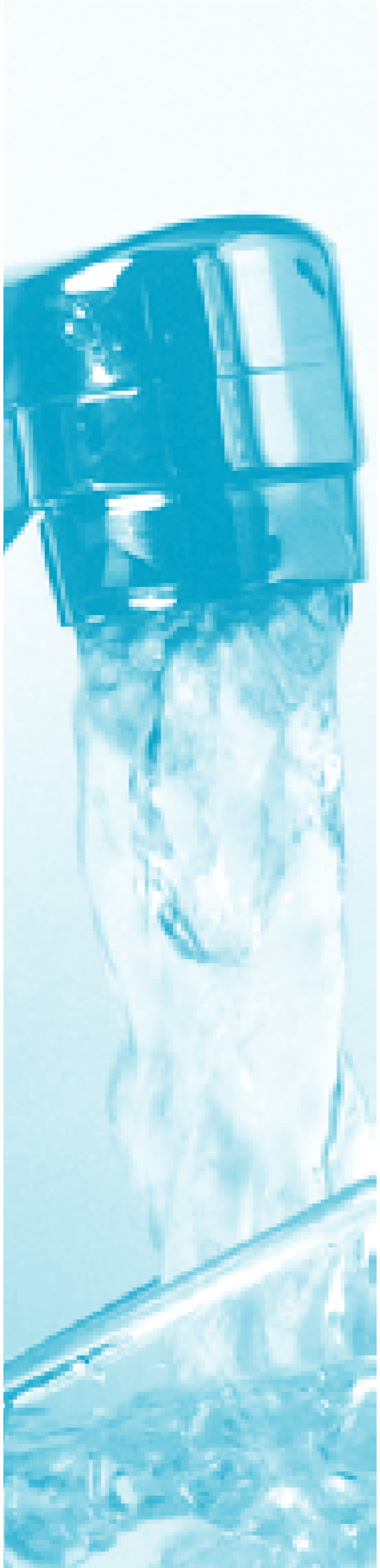
Critical Deadlines & Requirements

For Drinking Water Systems

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

For States

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



Monitoring Requirements

Gross Alpha, Combined Radium-226/228, and Uranium (1)	Beta Particle and Photon Radioactivity (1)
Initial Monitoring	
Four consecutive quarters of monitoring.	No monitoring required for most CWSs. Vulnerable CWSs (2) must sample for: • Gross beta: quarterly samples. • Tritium and Strontium-90: annual samples.
Reduced Monitoring	
If the average of the initial monitoring results for each contaminant is below the detection limit: One sample every 9 years. If the average of the initial monitoring results for each contaminant is greater than or equal to the detection limit, but less than or equal to one-half the MCL: One sample every 6 years. If the average of the initial monitoring results for each contaminant is greater than one-half the MCL, but less than or equal to the MCL: One sample every 3 years.	If the running annual average of the gross beta particle activity minus the naturally occurring potassium-40 activity is less than or equal to 50 pCi/L: One sample every 3 years.
Increased Monitoring	
A system with an entry point result above the MCL must return to quarterly sampling until 4 consecutive quarterly samples are below the MCL.	If gross beta particle activity minus the naturally occurring potassium-40 activity exceeds 50 pCi/L, the system must: • Speciate as required by the State. • Sample at the initial monitoring frequency.

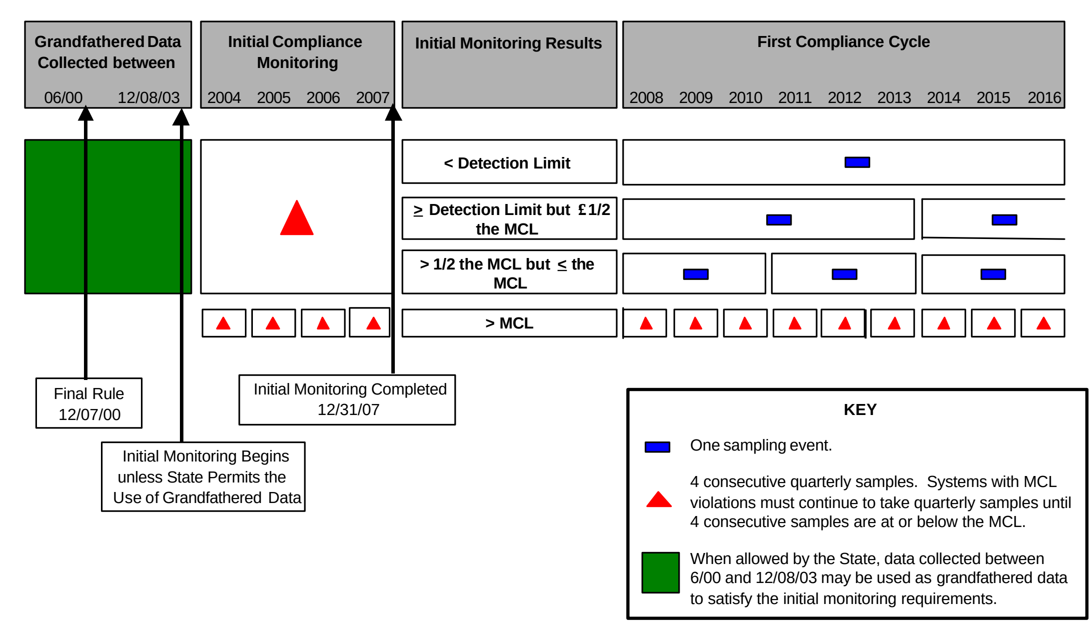
(1) All samples must be collected at each entry point to the distribution system.
(2) The rule also contains requirements for CWSs using waters contaminated by effluents from nuclear facilities.

Grandfathering of Data

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

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

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



For additional information on the Radionuclides Rule

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

Secondary Drinking Water Regulations: Guidance for Nuisance Chemicals

EPA 810/K-92-001
July 1992

What are Secondary Standards?

The U.S. Environmental Protection Agency (EPA) has established National Primary Drinking Water Regulations that set mandatory water quality standards for drinking water contaminants. These are enforceable standards called "maximum contaminant levels" or "MCLs", which are established to protect the public against consumption of drinking water contaminants that present a risk to human health. An MCL is the maximum allowable amount of a contaminant in drinking water which is delivered to the consumer .

In addition, EPA has established National Secondary Drinking Water Regulations that set non-mandatory water quality standards for 15 contaminants. EPA does not enforce these "secondary maximum contaminant levels" or "SMCLs." They are established only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at the SMCL.

Why Set Secondary Standards?

Since these contaminants are not health threatening at the SMCL, and public water systems only need test for them on a *voluntary* basis, then why it is necessary to set secondary standards?

EPA believes that if these contaminants are present in your water at levels above these standards, the contaminants may cause the water to appear cloudy or colored, or to taste or smell bad. This may cause a great number of people to stop using water from their public water system even though the water is actually safe to drink.

Secondary standards are set to give public water systems some guidance on removing these chemicals to levels that are below what most people will find to be noticeable.

What problems are caused by THESE contaminants?

There are a wide variety of problems related to secondary contaminants. These problems can be grouped into three categories: *Aesthetic effects* -- undesirable tastes or odors; *Cosmetic effects* -- effects which do not damage the body but are still undesirable; and *Technical effects* -- damage to water equipment or reduced effectiveness of treatment for other contaminants. The secondary MCLs related to each of these effects are given in Table 1.

Aesthetic Effects

Odor and Taste are useful indicators of water quality even though odor-free water is not necessarily safe to drink. Odor is also an indicator of the effectiveness of different kinds of treatment. However, present methods of measuring taste and odor are still fairly subjective and the task of identifying an unacceptable level for each chemical in different waters requires more study. Also, some contaminant odors are noticeable even when present in extremely small amounts. It is usually very expensive and often impossible to identify, much less remove, the odor-producing substance.

- *Standards related to odor and taste:* Chloride, Copper, Foaming Agents, Iron, Manganese pH, Sulfate, Threshold Odor Number (TON), Total Dissolved Solids, Zinc.

Color may be indicative of dissolved organic material, inadequate treatment, high disinfectant demand and the potential for the production of excess amounts of disinfectant by-products. Inorganic contaminants such as metals are also common causes of color. In general, the point of consumer complaint is variable over a range from 5 to 30 color units, though most people find color objectionable over 15 color units. Rapid changes in color levels may provoke more citizen complaints than a relatively high, constant color level.

- *Standards related to color:* Aluminum, Color, Copper, Foaming Agents, Iron, Manganese, Total Dissolved Solids.

Foaming is usually caused by detergents and similar substances when water has been agitated or aerated as in many faucets. An off-taste described as oily, fishy, or perfume-like is commonly associated with foaming. However, these tastes and odors may be due to the breakdown of waste products rather than the detergents themselves.

- *Standards related to foaming:* Foaming Agents.

Cosmetic Effects

Skin discoloration is a cosmetic effect related to silver ingestion. This effect, called argyria, does not impair body function, and has never been found to be caused by drinking water in the United States. A standard has been set, however, because silver is used as an antibacterial agent in many home water treatment devices, and so presents a potential problem which deserves attention.

- *Standard related to this effect:* Silver.

Tooth discoloration and/or pitting is caused by excess fluoride exposures during the formative period prior to eruption of the teeth in children. The secondary standard of 2.0 mg/L is intended as a guideline for an upper boundary level in areas which have high levels of *naturally occurring* fluoride. It is *not* intended as a substitute for the lower concentrations (0.7 to 1.2 mg/L) which have been recommended for systems which *add* fluoride to their water. The level of the SMCL was set based upon a balancing of the beneficial effects of protection from tooth decay and the undesirable effects of excessive exposures leading to discoloration.

- *Standard related to this effect:* Fluoride.

Technical Effects

Corrosivity, and *staining* related to corrosion, not only affect the aesthetic quality of water, but may also have significant economic implications. Other effects of corrosive water, such as the corrosion of iron and copper, may stain household fixtures, and impart objectionable metallic taste and red or blue-green color to the water supply as well. Corrosion of distribution system pipes can reduce water flow.

- *Standards related to corrosion and staining:* Chloride, Copper, Corrosivity, Iron, Manganese, pH, Total Dissolved Solids, Zinc.

Scaling and *sedimentation* are other processes which have economic impacts. Scale is a mineral deposit which builds up on the insides of hot water pipes, boilers, and heat exchangers, restricting or even blocking water flow. Sediments are loose deposits in the distribution system or home plumbing.

- *Standards related to scale and sediments:* Iron, pH, Total Dissolved Solids, Aluminum.

Table I. Secondary Maximum Contaminant Levels

Contaminant	**Secondary MCL**	**Noticeable Effects above the Secondary MCL**
Aluminum	0.05 to 0.2 mg/L*	colored water
Chloride	250 mg/L	salty taste
Color	15 color units	visible tint
Copper	1.0 mg/L	metallic taste; blue-green staining
Corrosivity	Non-corrosive	metallic taste; corroded pipes/ fixtures staining
Fluoride	2.0 mg/L	tooth discoloration

Foaming agents	0.5 mg/L	frothy, cloudy; bitter taste; odor
Iron	0.3 mg/L	rusty color; sediment; metallic taste; reddish or orange staining
Manganese	0.05 mg/L	black to brown color; black staining; bitter metallic taste
Odor	3 TON (threshold odor number)	"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	skin discoloration; graying of the white part of the eye
Sulfate	250 mg/L	salty taste
Total Dissolved Solids (TDS)	500 mg/L	hardness; deposits; colored water; staining; salty taste
Zinc	5 mg/L	metallic taste
** mg/L is milligrams of substance per liter of water*		

How can these Problems be Corrected?

Although state health agencies and public water systems often decide to monitor and treat their supplies for secondary contaminants, federal regulations do not require them to do this. Where secondary contaminants are a problem, the types of removal technologies discussed below are corrective actions which the water supplier can take. They are usually effective depending upon the overall nature of the water supply.

Corrosion control is perhaps the single most cost-effective method a system can use to treat for iron, copper and zinc due to the significant benefits in (1) reduction of contaminants at the consumer's tap, (2) cost savings due to extending the useful life of water mains and service lines, (3) energy savings from transporting water more easily through smoother, uncorroded pipes, and (4) reduced water losses through leaking or broken mains or other plumbing. This treatment is used to control the acidity, alkalinity or other water qualities which affect pipes and equipment used to transport water. By controlling these factors, the public water system can reduce the leaching of metals such as copper, iron, and zinc from pipes or fixtures, as well as the color and taste associated with these contaminants. It should be noted that corrosion control is not used to remove metals from contaminated source waters.

Conventional treatments will remove a variety of secondary contaminants. *Coagulation/ flocculation* and *filtration* removes metals like iron, manganese and zinc. *Aeration* removes odors, iron and manganese. *Granular activated carbon* will remove most of the contaminants which cause odors, color, and foaming.

Non-conventional treatments like *distillation*, *reverse osmosis* and *electrodialysis* are effective for removal of chloride, nitrates, total dissolved solids and other inorganic substances. However, these are fairly expensive technologies and may be impractical for smaller systems.

Non-treatment options include blending water from the principal source with uncontaminated water from an alternative source.

What Can You Do?

If you are concerned about the presence of secondary contaminants in your drinking water supply, here are a few suggestions:

- **FIRST, identify your local public water system**. If you pay a water bill, the name, address, and telephone number of your supplier should be on the bill. If you do not pay a water bill, then contact your landlord, building manager, or the local health department -- they should know.
- **SECOND, contact your local public water system.** Inquire about your supplier's monitoring for secondary contaminants. Ask for the list of secondary contaminants which are being monitored in your water supply. Does the water being delivered to the public meet these SMCLs? If you have not yet received notice from your supplier, ask how you can get a copy of the monitoring results.
- **THIRD, if you receive a public notice from your local public water system** regarding other

drinking water standards -- READ IT CAREFULLY -- and follow any instructions closely. If you have questions or concerns, contact the person from the water system who is indicated in the notice. If that person is unavailable, contact either the state drinking water program or your local health department.

- **FOURTH, contact your state drinking water program** if your water supplier is unable to provide the information you need. Ask if your water supplier is consistently in compliance with both primary and secondary drinking water regulations. Request a copy of monitoring results that were submitted to the State by your supplier. Your state drinking water program is usually located in the state capital (or another major city), and is often part of the department of health or environmental regulation. Consult the blue "government pages" of your local phone book for the proper address and phone number, or call the Safe Drinking Water Hotline.
- **FIFTH, support rate increases for your local water supplier,** where necessary, to upgrade your supplier's treatment facilities to meet drinking water standards.
- **FINALLY, if you have a private well** and you think that the well may be near a source of contamination or may have been contaminated -- HAVE YOUR WATER TESTED by a certified laboratory. A list of certified labs is available from your state's laboratory certification officer. A list of the certification officers can be obtained from the Safe Drinking Water Hotline.

For More Information

For more information on secondary contaminants, write or call the EPA. Ask for a list of the primary and secondary contaminants, about monitoring requirements for these, and for a list of the health advisories available for these contaminants.

or call the Safe Drinking Water Hotline
at 1-800-426-4791

About Portable Document Format Files

HTML, the code used to create Web pages, cannot maintain all of the original formatting and presentation of many documents. In such cases, EPA uses a different format called Portable Document Format (PDF). PDF documents maintain the look of the original document, and they can be viewed on any Macintosh, PC, or Unix computer. However, you must download and install the free Acrobat* Reader* program at http://www.adobe.com/products/acrobat/readstep2.html EXIT disclaimer. Please be sure to use the most current reader from Adobe to ensure compatibility for all PDF files on EPA's site.

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Drinking Water and Health Basics

Frequently Asked Questions

Local Drinking Water Information

Drinking Water Standards

List of Contaminants & MCLs

Regulations & Guidance

Public Drinking Water Systems

Source Water Protection

Underground Injection Control

Data & Databases

Drinking Water Academy

Safe Drinking Water Act

National Drinking Water Advisory Council

Water Infrastructure Security

Drinking Water For Kids!

About The Office of Ground Water & Drinking Water

Office mission

Office Links

Office mission

Fact sheet about the Office

Organization Chart

Mail, Phone, and Fax

OGWDW, together with states, tribes, and our many partners, will protect public health by ensuring safe drinking water and protecting ground water.

We will accomplish this mission using the following principles:

Prevention as an effective approach;

Risk-based priority setting for new and existing regulations, based on sound science, quality data in reliable databases, and quality methods and standards;

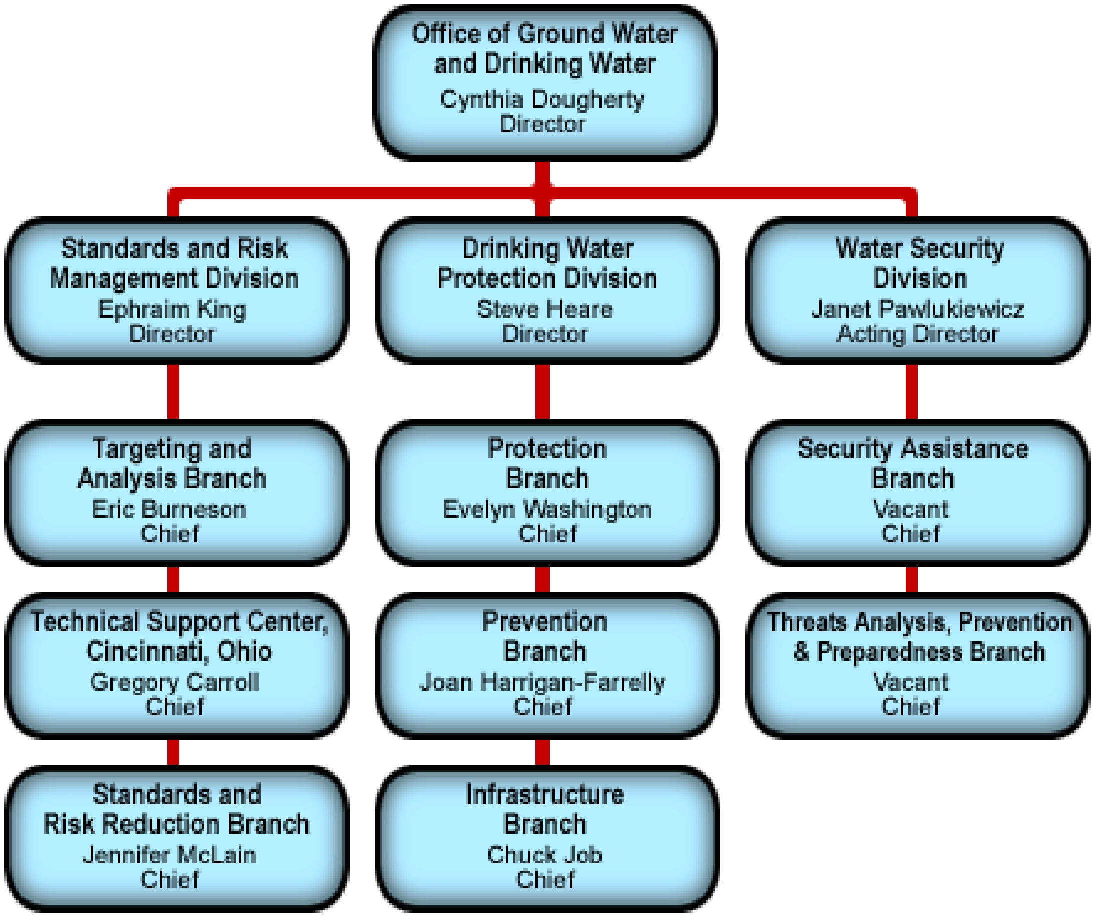
Partnership and involvement of public and private organizations, citizens, and communities;

Flexibility and effectiveness in implementation while maintaining a national public health baseline;

Accountability of all parties through public participation and accessible information; and

Results documented and presented clearly.

Office organization



The Office works closely with EPA's Regional Offices.

Standards and Risk Management Division

Targeting and Analysis Branch
Activities: develops regulatory tools in the areas of drinking water treatment technologies, analytical methods, cost/ benefit analysis, contaminant identification and occurrence; and develops regulations for individual chemical contaminants in drinking water such as radon, arsenic, and emerging new contaminants.

Technical Support Center, Cincinnati, Ohio
Activities: provides technical and scientific support to the development and implementation of drinking water regulations; manages Unregulated Contaminant Monitoring Rule implementation and drinking water laboratory certification program; supports Partnership for Safe Water, treatment plant optimization and analytical methods development.

Standards and Risk Reduction Branch
Activities: develops drinking water regulations and guidance for control of microbial contaminants and disinfection byproducts, other high priority contaminants, and improved distribution system operations collects microbial,

disinfection byproduct, water quality parameter, and treatment process data to determine contaminant occurrence in drinking water; evaluates waterborne disease outbreak, toxicological and edpdemiological data to support risk modeling to evaluate public health risk; analyzes economic issues, and plans and tracks research in support of drinking water regulations.

Drinking Water Protection Division

Protection Branch
Activities: responsible for implementation of the Public Water Supply System program, including operator certification, small systems technical assistance, chemical monitoring, and the tribal program.

Prevention Branch
Activities: responsible for implementation of the source water assessment and protection program, including wellhead protection, comprehensive state ground water protection, and the sole source aquifer program, and the Underground Injection Control program.

Infrastructure Branch
Activities: maintains information on drinking water through computer databases and the Internet, responsible for the Drinking Water State Revolving Fund, and works to promote consumer awareness of safe drinking water issues.

Office Mail, Phone, & Fax information

For General Inquiries: Safe Drinking Water Hotline

1 - 800 - 426 - 4791

Office of Ground Water and Drinking Water (4601)

Mailing address:
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460-0003

Street address:
EPA East
1201 Constitution Ave, NW
Washington, DC 20460-0003

Phone: 202-564-3750
Fax: 202-564-3753 (Director's office)
Fax: 202-564-3751 (Drinking Water Protection Division)
Fax: 202-564-3752 (Standards and Risk Management Division)

Technical Support Center:
U.S. EPA
26 Martin Luther King Drive
Cincinnati, Ohio 45268
Phone: 513-569-7948
Fax: 513-569-7191

E-mail addresses for EPA staff take the form of lastname.firstname@epa.gov

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publication number identifies:

-The responsible organization producing the publication.
-A specific office/division within the organization.
-An alpha descriptor of the document type.
-Calendar year in which the publication was produced.
-And the sequential number identifying how many of that type of
publication were produced within that particular organization during the
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Ground Water & Drinking Water

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Drinking Water Academy
Safe Drinking Water Act
National Drinking Water Advisory Council
Water Infrastructure Security

Drinking Water For Kids!

Links to Partners

EPA's drinking water program is organized into 10 regional offices and an office in Washington DC. EPA works with the states and many other partner organizations to ensure that Americans enjoy safe drinking water. The following links transport you off EPA's web site. While EPA encourages the use of all resources to obtain accurate, current information, EPA does not necessarily endorse the views or the accuracy of the information presented on these sites. (Our policy on links) EXIT disclaimer

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States ~ Federal agencies ~ Drinking water organizations
Environmental & public health organizations ~ Trade associations
International organizations

State and Territorial Drinking Water Protection Programs

Alabama	Hawaii	Michigan	North Carolina	Tennessee
Alaska	Idaho	Minnesota	North Dakota	Texas
American Samoa	Illinois	Mississippi	N. Mariana Is.	Utah
Arizona	Indiana	Missouri	Ohio	Vermont
Arkansas	Iowa	Montana	Oklahoma	Virgin Islands
California	Kansas	Nebraska	Oregon	Virginia
Colorado	Kentucky	Nevada	Pennsylvania	Washington
Connecticut	Louisiana	New Hampshire	Puerto Rico	Washington, DC
Delaware	Maine	New Jersey	Rhode Island	West Virginia
Florida	Maryland	New Mexico	South Carolina	Wisconsin
Georgia	Massachusetts	New York	South Dakota	Wyoming
Guam				

Other State Environmental Agencies -

The Association of State and Interstate Water Pollution Control Administrators maintains an index of links to State environmental agencies.

Related Federal Agencies

The Centers for Disease Control and Prevention promotes health and quality of life by preventing and controlling disease, injury, and disability.

U.S.Department of Agriculture - Rural Utilities Service provides loans, grants and loan guarantees for drinking water, sanitary sewer, solid waste and storm drainage facilities in rural areas and cities and towns of 10,000 or less.

U.S. Food and Drug Administration regulates food (including bottled water), cosmetics, medicines, and other products.

U.S. Geological Survey provides the nation with reliable, impartial information to describe and understand the earth.

Drinking Water Protection Organizations

American Water Resources Association promotes understanding of water resources and related issues by providing a multidisciplinary forum for education, professional development and information exchange.

American Water Works Association is an international non-profit scientific and educational society dedicated to the improvement of drinking water quality and supply.

American Water Works Research Foundation sponsors practical, applied, and future-need based research for the drinking water community.

Association of Boards of Certification helps environmental certifying authorities do a better job by sharing information, know-how, and resources.

Association of Metropolitan Water Agencies is made up of the directors, commissioners, and managers of the nation's largest municipal and publicly-owned water systems.

Association of State and Interstate Water Pollution Control Administrators is an independent, nonpartisan organization of state water program managers.

Association of State Drinking Water Administrators is the professional association that represents the collective interests of the nation's state drinking water programs.

Clean Water Action is a national citizens' organization working for clean, safe and affordable water, prevention of health-threatening pollution, creation of environmentally- safe jobs and businesses, and empowerment of people to make democracy work.

Council of Infrastructure Financing Authorities is a national organization of state, regional, and local financing authorities, and is a principal advocate for needed infrastructure funding from all levels of government.

Foundation for Cross-Connection Control and Hydraulic Research offers training courses and training tools to assist those involved in cross-connection control.

The Groundwater Foundation is dedicated to informing the public about one of our greatest hidden resources, groundwater.

Ground Water Protection Council is a national, not-for-profit organization whose members are interested in the protection of the nation's ground water supplies.

National Association of Regulatory Utility Commissioners serve the consumer interest by seeking to improve the quality and effectiveness of public regulation in America.

National Association of Water Companies is the trade association that represents the private and investor-owned water utility industry.

National Drinking Water Clearinghouse assists small communities by collecting, developing and providing timely information relevant to drinking water issues.

National Ground Water Association enhances the skills and credibility of all ground water professionals, develop and exchange industry knowledge, and promote the ground water industry and understanding of ground water resources.

National Rural Water Association is a nonprofit, grassroots organization representing the vast majority of water systems in the country, governed by a volunteers from each state.

NSF International develops standards, provides education, and provides third-party conformity assessment services while representing the interest of all stakeholders.

National Watershed Network is a coordinated national effort to encourage the formation of local, voluntary watershed partnerships and help assure that these partnerships successfully attain their goals.

Partnership for Safe Water encourages and assists U.S. water suppliers to voluntarily enhance their water systems performance for greater control of *Cryptosporidium*, *Giardia* and other microbial contaminants.

Rural Community Assistance Program helps rural people to improve the quality of life in their communities.

WaterWiser is a clearinghouse of water conservation and efficiency information.

Environmental and Public Health Organizations

American Ground Water Trust protects America's ground water, promotes public awareness of the environmental and economic importance of ground water, and provides accurate information to assist public participation in water resources decisions.

American Public Health Association is the oldest and largest organization of public health professionals in the world.

American Society for Microbiology is the oldest and largest single life science membership organization in the world.

American Society for Testing and Materials is the developer and provider of voluntary consensus standards, related technical information, and services having internationally recognized quality and applicability that promote public health and safety.

Association of State and Territorial Health Officials is a non-profit public health organization that represents the leaders of State and Territorial health agencies.

Consumer Federation of America works with public officials to promote beneficial policies, to oppose harmful policies, and to ensure a balanced debate on important issues in which consumers have a stake.

Environmental Council of States is the national non-profit, non-partisan association of state and territorial environmental commissioners.

Environmental News Network host a global online network for the environmental community by providing valuable content, communications and commerce opportunities.

Environmental Working Group is a leading content provider for public interest groups and concerned citizens who are campaigning to protect the environment.

League of Women Voters Education Fund provides local and state Leagues, as well as the wider public, with information and educational services on elections and on current public policy issues.

National Environmental Education and Training Foundation helps America meet critical national challenges through environmental learning.

National Environmental Health Association works to advance the environmental health and protection professional for the purpose of providing a healthful environment for all.

Natural Resources Defense Council uses law, science, and the support of more than 400,000 members nationwide to protect the planet's wildlife and wild places and to ensure a safe and healthy environment for all living things.

Sierra Club promote the responsible use of the earth's ecosystems and resources.

Public Interest Research Group are state-based advocates for the public interest.

Related Trade Associations

American Petroleum Institute represents the Nation's Oil and Natural Gas Industry.

International Bottled Water Association is the trade association representing the bottled water industry.

Water Quality Association represents manufacturers and distributors of household, commercial, industrial and small system water treatment systems.

International Organizations

Water For People is a nonprofit, charitable organization in the United States and Canada that helps people in developing countries obtain safe drinking water.

WaterPartners International is a non-governmental organization that links donors to high quality partner organizations that help communities design and construct their own sustainable water supply systems.

World Health Organization's objective is the attainment by all peoples of the highest possible level of health.

World Water Council is a nonprofit organization devoted to long-term global water policy.

El Agua

La Agencia Estadounidense de Protección Ambiental (EPA) trabaja con los estados y los proveedores de agua para asegurar que el público reciba agua potable segura. En esta pagina, hemos compilado información sobre el agua. Aqui se encuentra información importante sobre cómo proteger su salud y la de sus hijos, y tambien información mas divertida. Su proveedor de agua potable le enviará un informe anual breve para explicarle de donde proviene el agua que usted bebe, cual es su contenido, y cuan saludable es. Espere este informe por correo y lealo. Porque cuando se trata de saber que tipo de agua potable esta bebiendo, el ingrediente mas importante es usted.

el agua ~ **la salud** ~ **los niños** ~ **protegiendo el agua**

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el agua potable

- Agua potable y la salud: lo que usted debe saber (EPA 816-K-00-001): Apprenda de donde proviene el agua potable, lo que se puede contener, y mucho mas.
- Estándares del Reglamento Nacional Primario de Agua Potable (EPA 815-F-00-007)
- Estableciendo estándares para agua potable segura (EPA 815-F-00-008).
- En el Centro de Informacion y Estadisticas del Medio Ambiente se puede encontrar información sobre la calidad de su agua potable.

la salud

- Desinfección de Emergencia del Agua Potable: En momentos de crisis, es posible que los departamentos locales de salud indiquen urgentemente a los consumidores tomar más precauciones o medidas adicionales. (EPA 815-F-00-006)

- Plomo en el agua potable: Lo que usted puede hacer para reducir el plomo en el agua potable. (EPA 815-K-00-001)
- El *Cryptosporidium* ha causado varios brotes de enfermedades hídricas gastrointestinales, con síntomas que incluyen diarrea, nausea y/o dolor de estómago. Individuos con el sistema severamente inmunocomprometido (es decir, con inmunodeficiencia severa) son más propensos a tener síntomas intensos y persistentes que las personas saludables. (EPA 815-F-00-005)
- Los nitratos [Saliendo del sitio de la EPA]: Los niveles altos de nitratos en el agua potable pueden causar una enfermedad potencialmente fatal en los bebés. Esta enfermedad se llama el "síndrome del bebé azul" o methemoglobinemia. Aunque esta enfermedad puede ocurrir a cualquier edad, el agua contaminada con nitratos puede ser fatal para niños menores de seis meses.
- El radón: El radón (un gas radioactivo) puede penetrar su vivienda directamente de los suelos, o disuelto en el agua potable. Comparado con el radón que entra en la vivienda a través del suelo, el que entra a través del agua es una fuente de riesgo mucho menor.
- ¿Debo comer los peces que yo pesco? Guía para comer en forma saludable, los peces que usted pesca.

los niños

- Los niños y los estándares del agua potable: Este folleto explica cómo los estándares nacionales han contribuido a proteger el agua potable y ha ayudado a los lectores a tomar decisiones razonables, gracias a la información ofrecida, sobre el agua que ellos y sus hijos beben. (EPA 810-K-99-001)
- Encuentra determinada palabras

protegiendo el agua

- Guia Para La Proteccion De Las Aguas Subterraneas: Esta guía detalla las actividades que contaminan las aguas subterráneas. Conocimiento de las fuentes de contaminación es necesario para poder proteger los abastecimientos de aguas subterráneas más vulnerables. (EPA 440/6-90-004)
- El Programa Nacional de Estuarios (PNE) fue establecido por enmiendas al Acta de Agua Limpia para identificar, restaurar y proteger estuarios significativos para los Estados Unidos.
- [Saliendo del sitio de la EPA] El programa de Asesoramiento de las Condiciones Rurales para la Protección

de los Acuíferos (ACRUPAS) tiene el objetivo de interesar al público sobre las condiciones a nivel rural que pudieran afectartar la calidad del agua subterreana. El documento consiste de una serie de capítulos, en forma de formularios para facilitar esta evaluación voluntaria.

- EPA ha producido una serie de anuncios del periódico y de la radio que animan a gente que aprenda sobre su agua potable.
- Video: El problema con los sistemas de disposición de poca profundidad.

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Privacy and Security Notice

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- the type of browser and operating system used (if provided by the browser)
- the URL of the referring page (if provided by the browser)
- the object requested
- completion status of the request
- pages visited

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- they track what information you view at a site (important to commercial sites trying to determine your buying preferences);
- in the more advanced cases they track your movements through many Web sites but not the whole Web;
- businesses use them for customer convenience to allow them to produce a list of items to buy and pay for them all at one time and to garner information about what individuals are buying at their sites;
- advertisers use them to determine the effectiveness of their marketing and offer insights into consumer preferences and tastes by collecting data from many Web sites; and
- they can be used to help a Web site tailor screens for each customer's preference.

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- why EPA is collecting the information;
- what information is to be collected;
- the intended use of the information;
- how it will be protected/secured;
- if it will be shared within or outside EPA, including on publicly available Web sites;
- if shared, with whom;
- the opportunity to consent to, or reject, the collection and/or sharing, and

- when it will be destroyed.

How the Information is Used: We may store **non-personally identifiable information** we collect (such as search engine queries and anonymous survey responses) indefinitely to help us better understand and meet the needs of our visitors. We may share **non-personally identifiable information** with others, including the public, in aggregated form (for instance, in a list of our most popular search engine queries), in partial or edited form (such as in a report summarizing responses to a questionnaire), or verbatim (for example, in a complete listing of survey responses).

Your Rights under the Privacy Act: The Privacy Act of 1974 protects the personal information the federal government keeps on you in systems of records (SOR) (information an agency controls that can be retrieved by name or some other personal identifier). The Privacy Act regulates how the government can disclose, share, provide access to, and maintain the personal information that it collects. Not all information collected online is covered by the Privacy Act.

The Act s major provisions require agencies to:

- publish a Privacy Act Notice in the Federal Register explaining the existence, character and uses of a new or revised SOR;
- keep information about you accurate, relevant, timely, and complete to assure fairness in dealing with you; and
- allow you to, upon request, access and review your information held in a SOR and request amendment of the information if you disagree with it.

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Interaction with Children: Some EPA Web pages provide content to children. It is EPA policy, in compliance with the requirements of the Children's Online Privacy Protection Act (COPPA), to collect no information online about or from children age 13 and under except when it is needed to identify a submission or to answer a question. Any such instances on Web pages for children will be clearly marked, and a separate privacy notice will be posted on that Web page. Under no circumstances will any of the information be used for another purpose or shared with third parties, nor will personally identifying information be published on the EPA Web site.

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U.S. Environmental Protection Agency

Drinking Water for Kids

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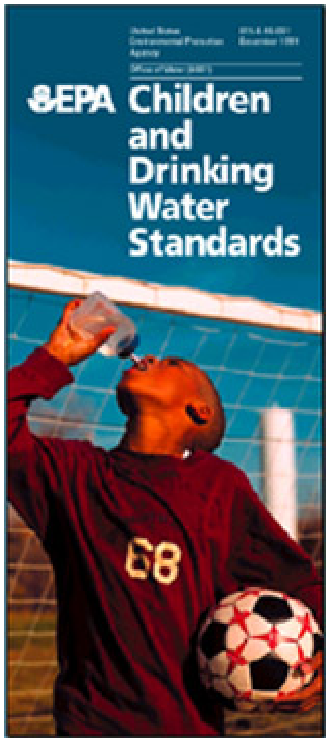
Children and Drinking Water Standards



There's been a lot of talk lately about drinking water. You may have seen features in the newspaper, on television news and in popular magazines, even in movies and television specials. This media coverage, combined with the new annual reports on drinking water that water systems are sending directly to their customers, is making many people think more about their drinking water. A question many people have on their minds is: Should I be concerned about the tap water my children are drinking? This booklet explains how national standards contribute to drinking water safety, and helps readers make informed, reasonable choices about the water they and their children drink.

- Read the Children and Drinking Water Standards booklet in HTML format or PDF format

For help using the free Adobe PDF Reader, see the EPA home page.

Some communities have made their annual water quality reports available online on this site. For more information about the drinking water quality in your community and your state, read your water quality report if it is online, or contact your water supplier to get a copy.

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Classroom Activities & Experiments

The Water Sourcebook Series

The Water Sourcebook Series (PDF files) consists of 4 volumes appropriate for Grades K - 2, 3 - 5, 6 - 8, & 9 - 12. The Series explains how the water management cycle affects every aspect of the environment. The curriculum provides strong science and math content, but also links these subject areas to social studies and language arts. Each Water Sourcebook contains hands-on activities and investigations, fact sheets, reference materials, and a glossary of terms.

Other Classroom Activities

K-3

- How People Get Their Water [120K PDF]
- Where Does Your Water Come From? [18K PDF]
- Aquifer in a Cup [64K PDF]
- Water in the World [84K PDF]
- Build your own water cycle

4-7

- Non-Point Source Pollution [17K PDF]
- Water Purification by Evaporation & Condensation [16K PDF]
- Role of Plants in Water Filtration [16K PDF]
- Build Your Own Aquifer [44K PDF]
- Blue Thumb Water Treatment Plant [456K PDF]
- The Case of the Disappearing Water [52K PDF]
- Deep Subjects: Wells and Ground Water [304K PDF]
- Excuse Me: Is this the Way to the Drainpipe? [200K PDF]
- The Case of the Mysterious Renters [71K PDF]
- Where Does Your Water Come From? [15K PDF]
- Non-Point Source Pollution [14K PDF]
- Teach Kids About the Water Treatment Process

8-12

- Safe Drinking Water - Protecting America's Public Health Poster (EPA 816-H-02-001 January 2002)
- Source Water Protection: Surface Water [503K PDF]
- Source Water Protection: Ground Water [671K PDF]
- Build Your Own Watershed [24K PDF]
- Water Filtration [98K PDF]

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Games & Online Activities
Grades K - 6
Grades 7 - 12

Kids' Health

Classroom Activities & Experiments
Grades K - 6
Grades 7 - 12

Other Kids' Stuff

Español

Other Stuff for Kids

EPA Resources:

- EPA Teacher Page
- EPA Student Page
- Magnificent Ground Water Connection
- Main EPA Kids Page

Other Water Education Material (outside EPA):

EXIT EPA

- Blue Thumb Campaign
- Kids Stuff from Ground Water Foundation
- Message from Children of Mars
- USGS Water Education
- USGS Water Education Posters
- Give Water a Hand
- Lehigh Valley Water Suppliers, Inc.
- My Health My World

Kid's Stuff en Español

- Busqueda de Palabras

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Privacy and Security Notice

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- the originating Internet Provider address (IPA) (this address can refer to a specific computer; more frequently, commercial Internet providers use a temporary IPA which does not link to a specific computer)
- the type of browser and operating system used (if provided by the browser)
- the URL of the referring page (if provided by the browser)
- the object requested
- completion status of the request
- pages visited

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- if shared, with whom;
- the opportunity to consent to, or reject, the collection and/or sharing, and
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- allow you to, upon request, access and review your information held in a SOR and request amendment of the information if you disagree with it.

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Drinking Water Academy

Safe Drinking Water Act

National Drinking Water Advisory Council

Water Infrastructure Security

Drinking Water For Kids!

Estableciendo estándares para agua potable segura

EPA 815-F-00-008
mayo de 2000

Engish Version

"Una de las promesas fundamentales que debemos hacer a nuestra nación es que los alimentos que se coman y el agua que se beba no presenten peligros para la salud."

-El presidente Bill Clinton, en la renovación de la autorización de la ley de Agua Potable Segura, 6 de agosto de 1996

La Ley de Agua Potable Segura (SDWA, por sus siglas en inglés), aprobada en 1974 y enmendada en 1986 y en 1996, le otorga a la Agencia de Protección Ambiental de los Estados Unidos (EPA, por sus siglas en inglés), la autoridad para establecer estándares de agua potable. Este documento describe como la EPA fija estas estándares.

¿Qué son los estándares de agua potable?

Lo estándares de agua potable son regulaciones establecidas por la EPA para controlar el nivel de contaminantes en el agua potable de la nación. Estos estándares son parte del enfoque de "barreras múltiples" del SDWA para asegurar la protección del agua potable e incluye: el análisis y protección de las fuentes de agua, la protección de pozos y sistemas de captación, el tratamiento por medio de operadores cualificados y el control de la integridad de sistemas de distribución y de la información al público sobre la calidad del agua que beben. Con la contribución de la EPA, de los estados, de las tribus, de los servicios públicos de agua potable, de las comunidades y los ciudadanos, estas barreras múltiples aseguran que el agua potable en los Estados Unidos y territorios sea segura para beber. En la mayoría de los casos, la EPA delega a los estados y tribus la responsabilidad referente a la implementación de estos estándares.

Existen dos categorías de estándares del agua potable:

El **Reglamento Nacional Primario de Agua Potable** (estándar primario o NPDWR, por sus siglas en inglés) son los estándares aplicables legalmente a los sistemas públicos de agua. Los estándares primarios protegen la calidad del agua potable mediante la limitación de los niveles de contaminantes específicos que puedan afectar negativamente a la salud pública y que se sabe que existen o puedan existir en el agua. Estos estándares están relacionadas con los Niveles Máximos de Contaminantes o con las Técnicas de Tratamiento, los cuales se describen a continuación.

El **Reglamento Nacional Secundario de Agua Potable**(estándar secundario o NSDWR, por sus siglas en inglés) es una guía para informar sobre los contaminantes que pueden producir efectos estéticos, como decoloración de la piel o dentadura, o dificultades de sabor, olor y color en el agua potable. La EPA recomienda los estándares secundarios a los sistemas de agua pero no los obliga a cumplir con ellos . Sin embargo, los estados pueden adoptarlos como estándares obligatorios. Esta información se centra en estándares nacionales primarios.

¿Quién debe cumplir con los estándares de agua potable?

Los estándares de agua potable son aplicables a los sistemas públicos de agua, los cuales sirven agua para las personas a través de por lo menos 15 conexiones de servicio o sirven normalmente a por lo menos 25 individuos . Los sistemas públicos de agua incluyen: las empresas municipales, las asociaciones de propietarios de viviendas, escuelas, negocios, campings y centros comerciales.

¿Quién participa en el proceso del establecimiento de estándares?

La EPA considera las opiniones de muchos individuos y grupos durante el proceso de la creación de reglamentos. Uno de los medios establecidos, por el cual la EPA solicita la asistencia de los interesados, es el Consejo Asesor Nacional de Agua Potable o National Drinking Water Advisory Council (NDWAC). El comité de 15 miembros fue creado por la SDWA y está formado por cinco personas del público en general, cinco representantes del estado y de agencias locales relacionadas con la higiene y la distribución de agua , y cinco representantes de organizaciones privadas y grupos con un interés demostrado en la higiene y la distribución de agua, incluyendo dos miembros que tienen alguna asociación con los sistemas públicos de agua pequeños en áreas rurales. NDWAC asesora al administrador de la EPA en cuanto a todas las actividades de la agencia relacionadas con el agua potable.

Además del consejo asesor NDWAC, se aconseja a los representantes de los servicios de agua, a los grupos relacionados con el medio ambiente y a representantes del interés público, los estados, tribus y al público en general, que participen activamente en la creación de las regulaciones mediante su participación en las reuniones públicas y tomando responsabilidad en los reglamentos propuestos. También se hacen reuniones especiales para obtener opiniones de las comunidades formadas por grupos minoritarios y de bajos ingresos, y de representantes de negocios pequeños.

¿Cuáles son las prioridades actuales de la EPA para la creación de reglamentos?

La EPA está trabajando con aquellos que tienen un interés en crear los siguientes reglamentos:

Productos microbianos, desinfectantes y subproductos de desinfección

La EPA impondrá más control de patógenos microbianos, incluyendo *Cryptosporidium* y también desinfectantes y subproductos de desinfección.

"Agrupación M/DBP" de reglas, de 1998 al 2002

Radón

La EPA establecerá un nuevo estándar para el radón.
agosto del 2000

Radionucleidos

La EPA revisará las regulaciones actuales sobre los radionucleidos y establecerá un nuevo estándar para el uranio.
noviembre del 2000

Agua Subterránea

La EPA identificará aquellas medidas necesarias para proteger el agua subterránea de la contaminación microbiana.
noviembre del 2000

Arsénico

La EPA revisará el estándar existente de arsénico.
primavera del 2000

Muestreo de Contaminantes No Regulados

La EPA selecionará hasta 30 contaminantes no regulados para ser muestreados por sistemas públicos de agua con una población mínima de 100,000 personas.
agosto del 2000

¿Cómo la EPA establece los estándares del agua potable?

Las enmiendas del 1996 a la SDWA requiere que la EPA siga una serie de instrucciones para determinar si el establecer un estándar con relación a un contaminante en particular es necesario y si es así, cuál debe ser ese estándar. Los datos científicos revisados por iguales, apoyan a las evaluaciones intensivas tecnológicas que incluyen los siguientes factores: acontecimientos en el medio ambiente, personas expuestas a peligros que afectan negativamente la salud de la población en general y de los grupos más sensibles, métodos analíticos de detección, viabilidad técnica e, impactos de la regulación en los sistemas de agua, en la economía y en la salud pública.

Teniendo en cuenta la opinión pública durante el proceso, la EPA debe (1) identificar los problemas relacionados con el agua potable, (2) establecer prioridades y (3) establecer estándares.

1) Identificar los problemas del agua potable.

La EPA debe determinar primero los contaminantes que tiene que regular. Estas determinaciones están basadas en los peligros para la salud y en la posibilidad de que estos contaminantes puedan existir en los sistemas públicos de agua en cantidades preocupantes. La lista de posibles contaminantes en el agua potable a nivel nacional *The National Drinking Water Contaminant Candidate List (CCL)* que se publicó el 2 de marzo de 1998, incluye aquellos (1) que todavía no están regulados bajo el SDWA, (2) que puedan afectar negativamente a la salud, (3) que existan o pueden existir en los sistemas de agua potable y (4) que puedan requerir regulaciones bajo el SDWA.

2) Establecer prioridades.

Los contaminantes incluidos en el CCL están divididos en prioridades de regulación, investigación relacionada con la salud y en reunir información a medida que se dan los casos. Antes de agosto del año 2001, la EPA seleccionará cinco o más contaminantes de las prioridades reguladoras en el CCL y determinará si se deberán regular o no. Para apoyar estas decisiones, la agencia debe determinar si al regular estos contaminantes se presentará una oportunidad significativa para reducir los peligros de salud. Si la EPA determina que las regulaciones son necesarias, la agencia debe proponerlas antes del mes de agosto del año 2003 y finalizarlas antes del mes de febrero del año 2005.

La agencia también seleccionará hasta 30 contaminantes no regulados del CCL para el control de los mismos por parte de los sistemas públicos de agua con un servicio a una población mínima de 100,000 personas. Actualmente, la mayoría de los contaminantes no regulados que tienen el potencial de existir en el agua potable son los plaguicidas y los microbios. Cada cinco años, la EPA repetirá el ciclo de revisión del CCL y hará determinaciones reguladoras de cinco contaminantes; también identificará hasta 30 de ellos para muestrear sin regularlos. Además, cada seis años, la EPA volverá a evaluar las regulaciones existentes para poder determinar si es necesario modificarlas.

A partir del mes de agosto del año 1999, una nueva base de datos llamada *National Contaminant Occurrence Database* (NCOD) acumulará información sobre productos químicos, radiológicos, microbianos y físicos que sean contaminantes y que estén o no regulados; también reunirá datos sobre contaminantes que tengan la posibilidad de existir en aguas tratadas, naturales o en las fuentes de los sistemas públicos de agua en los Estados Unidos y territorios. Aunque la EPA será el usuario principal de NCOD, la información almacenada en la base de datos estará a la disposición del público en general.

3) Proponer y finalizar una Reglamentación Nacional Primaria de Agua Potable.

Al analizar los estudios hechos sobre los efectos en la salud, la EPA establece una meta del **Nivel Máximo de Contaminantes en el Agua Potable (MNMC)**, bajo el cual se producirán unos efectos negativos desconocidos o que no se anticiparon en la salud de las personas y se permitirá un margen adecuado de seguridad. Los MNMC son objetivos de salud pública cuya aplicación no se exige. Como los MNMC consideran solamente la salud pública y no los límites de la tecnología de detección y tratamiento, algunas veces se establecen a un nivel irrealizable para los sistemas de agua. Cuando se determina un MNMC, la EPA considera el peligro que corren los grupos de la población más sensible (bebés, niños, personas de edad avanzada y aquellos con problemas del sistema de inmunidad) en cuanto a sufrir diferentes problemas de salud.

- **No carcinógenos (no incluye contaminantes microbianos):** Para los productos químicos que pueden afectar negativamente a la salud, el MNMC está basado en la **dosis de referencia**. Una dosis de referencia (RFD, por sus siglas en inglés) es una cantidad aproximada de un producto químico al que se puede exponer una persona todos los días y que no se considera que pueda tener unos efectos negativos en la salud de ese individuo durante su vida. Al calcular la dosis de referencia, los grupos más sensibles han sido incluidos y la incertidumbre puede constituir un orden de magnitud. La RFD se multiplica por el peso de un adulto normal (70 kg) y su consumición de agua diaria (2 litros) para proporcionar el nivel equivalente de agua potable o *Drinking Water Equivalent Level* (DWEL). El DWEL se multiplica por el porcentaje de exposición diaria total que contribuye el agua potable (con frecuencia el 20 por ciento) para determinar el MNMC.

- **Productos químicos contaminantes; carcinógenos:** Si existe evidencia que un producto químico pueda causar cáncer y no existe una dosis bajo la cual ese producto pueda considerarse como no peligroso, el MNMC se pone en cero. Si un producto químico es un carcinógeno y se puede determinar una dosis que no presente peligro, el MNMC se pone a un nivel por encima de cero.

- **Contaminantes microbianos:** Para los contaminantes microbianos que puedan presentar un peligro en la salud pública, el MNMC se pone en cero, ya que al ingerir un protozoario, un virus o una bacteria puede tener efectos negativos en la salud. La EPA está haciendo unos estudios para determinar si existe un nivel por encima de cero donde algunos contaminantes microbianos no presenten peligro. Hasta ahora, esto no se ha establecido.

Una vez que se determine el MNMC, la EPA impondrá un estándar aplicable. En la mayoría de los casos, el estándar es el **Nivel Máximo del Contaminante**, (NMC),el nivel máximo permitido del contaminante en el agua, el cual llega a cualquier usuario del sistema público de agua.

El NMC, se fija tan cerca como sea posible del MNMC, el cual está definido por la SDWA como el nivel que se puede alcanzar con el uso de la mejor tecnología disponible, técnicas de tratamiento y otros medios que la EPA encuentre estar disponibles (al examinar su eficacia bajo las condiciones del lugar y no solamente del laboratorio) y tomando en cuenta el costo.

Cuando no exista un método confiable, económica y técnicamente apropiado para medir un contaminante en concentraciones particularmente bajas, se debe establecer una **Técnica de Tratamiento** (TT) en vez de un NMC. Una TT es un procedimiento o un nivel del resultado tecnológico aplicable que los sistemas públicos de agua deben seguir para controlar un contaminante. Algunos ejemplos de las reglas de las TT son la Regla de Tratamiento de Agua de Superficial (desinfección y filtración) y la Regla de Plomo y Cobre (control óptimo de corrosión).

Al determinar la NMC o la TT basándose en una tecnología razonablemente económica para los sistemas grandes, la EPA debe completar un análisis de economía para determinar si los beneficios de ese estándar justifican los costos. Si no es así, la EPA puede ajustar el NMC de una clase o grupo de sistemas en particular a un nivel que produzca unos beneficios máximos de reducción de los peligros de salud a un costo justificado. Es posible que la EPA no ajuste los NMC si los beneficios justifican los costos de sistemas grandes y los sistemas pequeños no tengan la posibilidad de recibir variaciones.

Los estados están autorizados a otorgar **variaciones** de los estándares para sistemas con un servicio que alcanza a un máximo de 3,300 personas, si dicho sistema no puede cumplir con una regla (a través del tratamiento, la fuente de agua de otro lugar diferente u otra reestructuración) y el sistema instala una tecnología variante aprobada por la EPA. Los estados pueden otorgar variaciones a sistemas con un servicio que alcanza de 3,301 a 10,000 personas con la autorización de la EPA. La SDWA no permite a los sistemas pequeños tener variaciones para los contaminantes microbianos.

Bajo ciertas circunstancias, las **exenciones** de estándares se pueden otorgar para permitir más tiempo en la búsqueda de otras opciones de cumplimiento o asistencia financiera. Al vencer el periodo de exención, el sistema público de agua debe estar en cumplimiento. Los términos de las variaciones y exenciones deben eliminar los peligros en la salud pública.

¿Cuándo deben los sistemas de agua pública cumplir con estándares primarios nuevos?

Los estándares primarios entran en vigor tres años después de ser finalizados. Si se necesitan grandes mejoras, el administrador de la EPA o de un estado puede permitir una prolongación de este periodo hasta un total de dos años adicionales.

¿Existen consideraciones especiales para los sistemas pequeños?

Los sistemas pequeños reciben una consideración especial por parte de la EPA y de los estados. Más del 90 por ciento de todos los sistemas públicos de agua son pequeños y estos sistemas enfrentan grandes problemas para proporcionar agua potable a un costo razonable. Las enmiendas de 1996 al SDWA, proporciona a los estados los instrumentos necesarios para cumplir con los estándares relacionadas con los sistemas pequeños. Al establecer nuevas estándares primarios, la EPA debe identificar las tecnologías que producen su cumplimiento y son razonablemente económicas para los sistemas con servicio a menos de 10,000 personas. Estas incluyen sistemas de tratamiento contenida o módulos de tratamiento y dispositivos de tratamiento de punto de entrada y punto de uso bajo el control del sistema de agua. Cuando tales tecnologías no se puedan identificar, la EPA debe indicar otras que reduzcan al máximo los contaminantes y protejan la salud pública de manera económica. Los sistema pequeños tienen tres categorías: los que sirven de 25 a 500 personas, los que sirven de 501 a 3,300 y los que sirven de 3,301 a 10,000. ¿Cómo puedo proveer mi opinión?

En el Registro Federal se anuncian las fechas para reuniones públicas y se publican reglas para recibir comentarios. Los siguientes recursos proporcionan esta y otra información sobre el agua potable.

El sitio en la web de la Oficina Sobre el Agua Subterránea y Potable:
http://www.epa.gov/safewater/

Línea directa de la EPA Sobre el Agua Potable
1 (800) 426-4791

Vuelta al Programa de los Estándares de Agua Potable

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Microbials and Disinfection Byproducts

A major challenge for water suppliers is how to balance the risks from microbial pathogens and disinfection byproducts. It is important to provide protection from these microbial pathogens while simultaneously ensuring decreasing health risks to the population from disinfection byproducts. The Safe Water Drinking Act requires EPA to develop rules to achieve these goals.

Read about current and future rules that protect people from microbes, disinfectants, and disinfection byproducts.

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Radon

Radon is a naturally-occurring radioactive gas that may cause cancer, and may be found in drinking water and indoor air. Some people who are exposed to radon in drinking water may have increased risk of getting cancer over the course of their lifetime, especially lung cancer. Radon in soil under homes is the biggest source of radon in indoor air, and presents a greater risk of lung cancer than radon in drinking water. As required by the Safe Drinking Water Act, EPA has developed a proposed regulation to reduce radon in drinking water that has a multimedia mitigation option to reduce radon in indoor air.

- Radon Project Plan
- Statutory Requirements
- Timeline
- Meeting Summaries
- Upcoming Events
- Federal Register Notices
- More Links
- Public Input

Radionuclides in Drinking Water

EPA has updated its standards for radionuclides in drinking water. EPA also has set a new standard for uranium, as required by the 1986 amendments to the Safe Drinking Water Act. The standards are: combined radium 226/228 (5 pCi/L); beta emitters (4 mrems); gross alpha standard (15 pCi/L); and uranium (30 µg/L).

- General information about radionuclides in drinking water
- Fact Sheet about the new standards
- Radionuclides final rule (December 7, 2000) (HTML version ~ PDF version)

Radionuclides Project Plan

Implementation and Guidance

Timeline

Regulatory Development Strategy

Meeting Summaries

Upcoming Events

Federal Register Notices

Public Input

Notice of Data Availability

- Notice of Data Availability (April 21, 2000) [read online in HTML or download PDF file]
- Technical Support Document
- Health Risk Reduction and Cost Analysis

Implementation and Guidance

You will need Adobe Acrobat Reader to view the Adobe PDF files on this page. See EPA's PDF page for more information about getting and using the free Acrobat Reader.

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Proposed Ground Water Rule

EPA 815-F-00-003
April 2002

- Proposed Ground Water Rule (May 10, 2000)
  (read online in HTML) (download in PDF)
- Questions and Answers about the proposal
- Regulatory Impact Analysis for the Proposed Ground Water Rule [PDF file]

EPA is proposing a rule which specifies the appropriate use of disinfection in ground water and addresses other components of ground water systems to assure public health protection. The Ground Water Rule (GWR) establishes multiple barriers to protect against bacteria and viruses in drinking water from ground water sources and will establish a targeted strategy to identify ground water systems at high risk for fecal contamination. The GWR is scheduled to be issued as a final regulation in Spring 2003.

Background

Although ground water has historically been thought to be free of microbial contamination, recent research indicates that some ground waters are a source of waterborne disease. Most cases of waterborne disease are characterized by gastrointestinal symptoms (diarrhea, vomiting, etc.) that are frequently self limiting in healthy individuals and rarely require medical treatment. However, these same symptoms are much more serious and can be fatal for persons in sensitive subpopulations (such as, young children, elderly and persons with compromised immune systems). In addition, research indicates that some viral pathogens found in ground water are linked to long term health effects (for example, adult onset diabetes, myocarditis). EPA does not believe all ground water systems are fecally contaminated; data indicate that only a small percentage of ground water systems are contaminated. However, the severity of health impacts and the number of people potentially exposed to microbial pathogens in ground water indicate that a regulatory response is warranted.

Presently, only surface water systems and systems using ground water under the direct influence of surface water are required to disinfect their water supplies. The 1996 amendments to the Safe Drinking Water Act require EPA to develop regulations that require disinfection of ground water systems “as necessary” to protect the public health (§1412(b)(8)). The proposed GWR will specify when corrective action (including disinfection) is required to protect consumers who receive water from ground water systems from bacteria and viruses.

This rule applies to public ground water systems (systems that have at least 15 service connections, or regularly serve at least 25 individuals daily at least 60 days out of the year). This rule also applies to any system that mixes surface and ground water if the ground water is added directly to the distribution system and provided to consumers without treatment. The GWR does not apply to privately owned wells, however, EPA recommends private well owners test for coliform bacteria once each year.

While developing the proposal, EPA consulted extensively with stakeholders. EPA benefited from the stakeholders’ participation in four public meetings across the country, and their comments are reflected in the proposed rule. EPA also received valuable input from small entity representatives as part of the Small Business Regulatory Enforcement Fairness Act (SBREFA) panel. The GWR Small Business Advisory Panel met seven times from April to June, 1998. Many of the panel’s recommendations have been incorporated into the proposed rule.

In February 1999, EPA posted an informal draft of the GWR preamble on the Internet. Approximately 300 copies were also mailed to participants of public meetings or to those who requested a copy. EPA received valuable comments and stakeholder input from over 80 individuals representing States, trade associations, environmental interest groups, as well as individual stakeholders.

Public comment on the Proposed Rule

EPA took public comment on the proposed Ground Water Rule for 60 days. The comment period closed August 4, 2000. EPA received over 250 comments. For more information, the general public can call the Safe Drinking Water Hotline at 800-426-4791. A fact sheet, the proposal, and additional information are also available at http://www.epa.gov/safewater/gwr/gwrfs.html.

What Requirements are Proposed in the GWR?

- System sanitary surveys conducted by the State and identification of significant deficiencies;

- Hydrogeologic sensitivity assessments for undisinfected systems;
- Source water microbial monitoring by systems that do not disinfect and draw from hydrogeologically sensitive aquifers or have detected fecal indicators within the system's distribution system;
- Corrective action by any system with significant deficiencies or positive microbial samples indicating fecal contamination; and
- Compliance monitoring for systems which disinfect to ensure that they reliably achieve 4-log (99.99 percent) inactivation or removal of viruses.

The proposed requirements are discussed in greater detail below:

Sanitary Surveys

Applies to:

All ground water systems

Frequency:

Every 3 years for community water systems; 5 years for non-community water systems, consistent with the 1998 Interim Enhanced Surface Water Treatment Rule (Community water systems serve the same populations year round, e.g., houses and apartment buildings. Non-community water systems do not serve the same people year round, e.g., schools, factories, office buildings, hospitals, gas station and campgrounds.)

Key components:

- State must perform each system's sanitary survey and address the 8 elements from the joint EPA and Association of State Drinking Water Administrators guidance.
- State must have authority to enforce corrective action requirements.
- State must provide a list of significant deficiencies (e.g., those that require corrective action) to the system within 30 days of identification of the deficiencies.

Hydrogeologic Sensitivity Assessment

Applies to:

All ground water systems which do not provide 4-log (99.99%) virus inactivation/removal

Frequency:

One-time assessment of sensitivity (within 6 years of the final rule's date of publication for community water systems and 8 years for non-community water systems). Sensitive systems must monitor monthly (see below).

Key components:

- State must conduct a one-time assessment of all systems that do not provide 4-log virus inactivation/removal to identify those systems located in sensitive aquifers.
- EPA considers karst, gravel, or fractured bedrock aquifers to be "sensitive" to microbial contamination. States may waive source water monitoring for sensitive systems if there is a hydrogeologic barrier to fecal contamination.

Source Water Monitoring

Applies to:

Ground water systems that are sensitive or have contamination in their distribution system ("triggered monitoring") and do not treat to 4-log removal or inactivation of viruses

Frequency:

Monthly for sensitive systems; once for triggered monitoring

Key Components:

- Routine Monitoring. For systems determined by the State to be hydrogeologically sensitive, the system must conduct monthly source water monitoring for fecal indicators. Sampling frequency may be reduced after twelve negative samples.
- Triggered Monitoring. If a total coliform-positive sample is found in the distribution system, then the system must collect one source water sample and monitor for a fecal indicator.

Corrective Actions

Applies to:

Ground water systems that have a significant deficiency or have detected a fecal indicator in their source water

Frequency:

Correct within 90 days or longer with a State-approved schedule

Key components:

- Significant Deficiency or Source Water Contamination. If a ground water system is notified of significant deficiencies by the State, or notified of a source water sample positive, within 90 days it must correct the contamination problem by eliminating the contamination source, correct the significant deficiencies, provide an alternative source water or install a treatment process which reliably achieves 4-log removal or inactivation of viruses. A system may take longer than 90 days for corrective action with a State-approved plan. Systems must notify the State of completion of the corrective action or the State must confirm correction within 30 days after the 90 day period or scheduled correction date.

- Treatment. Systems providing treatment must monitor treatment to ensure at least 4-log virus inactivation and/or removal.

Compliance Monitoring

Applies to:

Applies to all ground water systems that notify States they disinfect in order to avoid source water monitoring, and to systems which disinfect as a corrective action.

Frequency:

Systems serving less than 3,300 must monitor disinfection treatment once daily, while systems serving 3,300 or more people must monitor their disinfection treatment continuously.

Key components:

- If monitoring shows the disinfection concentration to be below the required level, the system must restore the disinfection concentration within 4 hours or notify the State.

For general information please contact the Safe Drinking Water Hotline at (800) 426-4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding Federal holidays, from 9:00 am to 5:30 PM Eastern Time.

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