

The Water In Your Life



A guide to
home water problems,
how they occur,
and how they can
be corrected.



ECOWATER
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SINCE 1925.

How Water Problems Originate

Water is an indestructible resource; there is as much water on earth and in the skies today as existed 5,000 years ago. However, clean water is a precious resource fundamental to life as we know it.

While our water supply remains constant, we are polluting it faster than nature can clean it. And, we are polluting it with more contaminants than ever before.

THE HYDROLOGICAL CYCLE

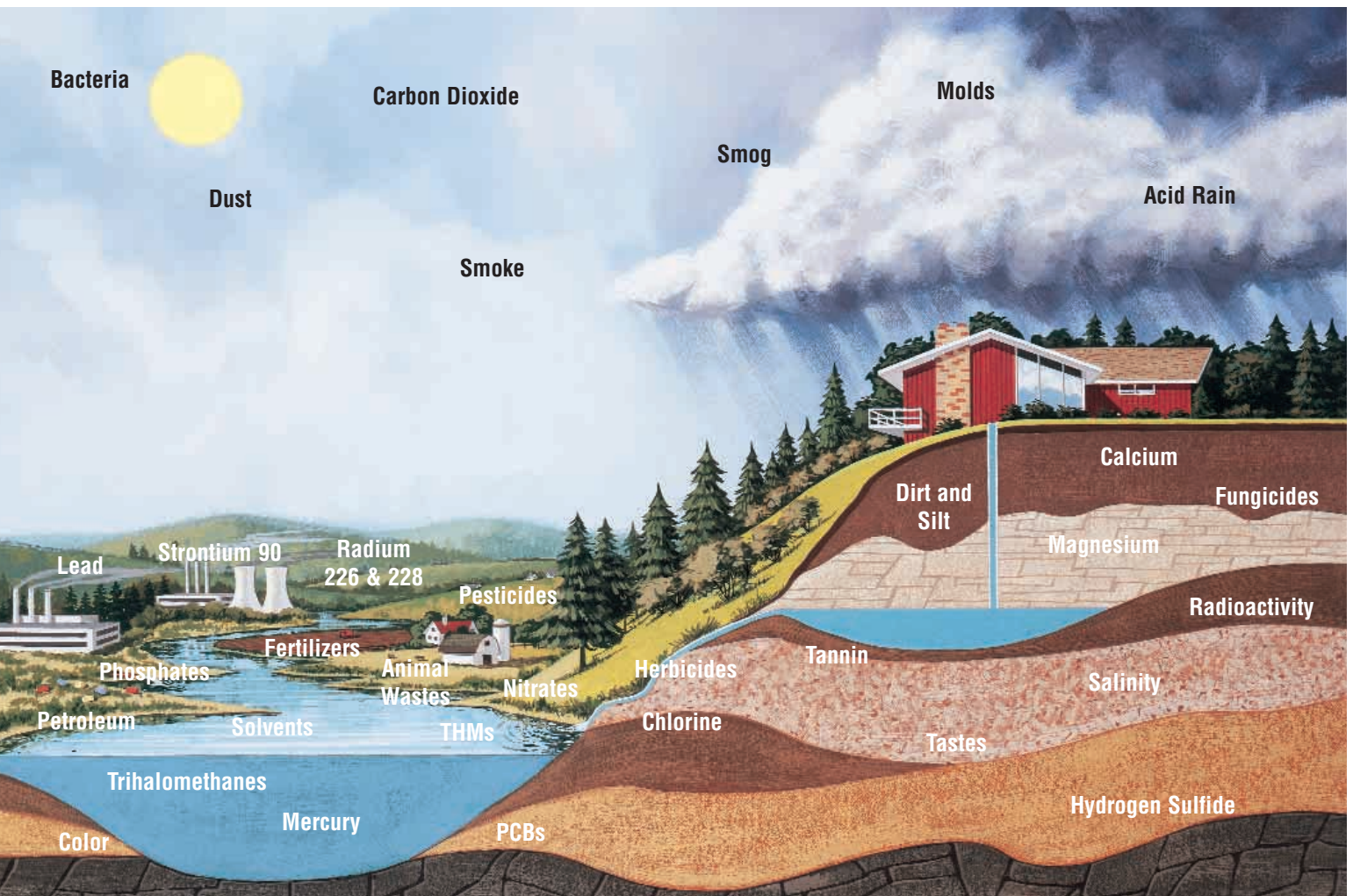
Nature purifies water through a process called the hydrological cycle. In this process, water evaporates from streams, lakes, and other surface water rising to the sky as vapor. In this vapor state, water is in its purest form with all contaminants left behind.

When enough vapor has joined together in the form of clouds, it falls to the earth as rain, snow, or other precipitation. This pure moisture begins to collect impurities from the air on its journey down. When it reaches the ground, it continues to collect everything from minerals to pesticides. Because of this ability to collect or absorb other substances, water is often referred to as nature's solvent.

NATURAL WATER PROBLEMS

The "path" that water takes to enter a home determines the types of problems it can have.

- Water passing through shale, limestone, and other soft rocks will dissolve and carry calcium and magnesium from those rocks into the home, causing hard water problems.
- Water passing through iron-bearing rock will collect iron, causing rust stains and other iron-related problems in the home.
- Water passing through granite, marble, and other extremely hard rocks cannot dissolve or absorb anything; it remains "hungry" or acidic as it enters the home, and begins dissolving or eating away at pipes and chrome plumbing fixtures.



- Water also collects tastes and odors as it passes through decaying vegetation, gases, minerals, and organic material beneath the earth's surface. A common taste and odor problem is caused by the absorption of hydrogen and sulfide, which gives water the taste and smell of rotten eggs.

MAN-MADE WATER PROBLEMS

In addition to natural contaminants, water absorbs man-made contaminants that cause significant water problems.

Modern society has made many scientific advances, but in the process has also created many new byproducts and contaminants. Thousands of chemicals and compounds have been invented in recent years, but effective methods for disposing of them after use have not kept pace.

Petrochemical spills and leaks from decades ago have seeped into the underground water supply. Pesticides, herbicides, fungicides, and fertilizers are washed by rainwater into streams, rivers, lakes, and wells.



The following table shows some contaminants and their potential effect on humans, as well as their source.

EPA WATER CONTAMINANT CHART

Contaminant	Possible Effect	Source
Microbiological		
Coliform and other bacteria	Gastroenteric infection, dysentery, typhoid fever, and cholera	human and animal fecal matter
Giardia lamblia	Gastroenteric disease	human and animal fecal matter
Legionella	Legionnaire's disease	natural waters, some water heaters
Turbidity	Interferes with disinfection, filtration	erosion, soil runoff, and discharges
Inorganics		
Asbestos	Cancer	asbestos cement in water systems
Arsenic	Cancer, skin and nervous system toxicity	pesticide, industrial waste, and smelting
Barium	Circulatory system effects	geological
Cadmium	Kidney effects	epoxy sealants, spent coal, and pigments
Fluoride	Skeletal and dental damage	fluoridated water, fertilizer, and aluminum
Lead	Kidney and nervous system damage	lead pipe and lead-based solder
Mercury	Kidney and nervous system disorders	crop runoff and batteries
Nitrate	Blue baby syndrome (methemoglobinemia)	fertilizer, sewage, and animal waste
Selenium	Liver damage	smelting and coal/oil combustion
Organics		
1,2,4 Trichlorobenzene	Changes in adrenal glands	discharge from textile finishing factories
Acrylamide	Cancer, nervous system or blood problems	added to water during sewage treatment
Benzene	Cancer, anemia	fuel, drugs, paint, and pesticides
Carbon Tetrachloride	Cancer, liver problems	cleaning solvents
Polychlorinated Biphenyls (PCBs)	Cancer, skin and liver damage, nausea	used in electrical transformers
Total Trihalomethanes	Cancer	surface water treated with chlorine
Tetrachloroethylene	Cancer, liver problems	dry cleaning materials waste, and solvents
Toluene	Nervous system, kidney or liver problems	discharge from petroleum factories
Styrene	Liver, kidney or circulatory problems	discharge from rubber and plastic factories, and leaching from landfills
Vinyl Chloride	Cancer	PVC pipe; solvent breakdown
Pesticides		
Carbofuran, Chlordane, Endrin, Heptachlor epoxide, Lindane, Methoxychlor, Toxaphene	Cancer, nervous system, respiratory system, liver, kidney, anemia, leukemia	insecticide for cotton, potatoes, corn, and alfalfa; used as fumigants; heptachlor epoxide converts to heptachlor by soil and water organisms
Herbicides		
Alachlor, Atrazine, Dalapon, Dinoseb, Diquat, Endothall, Glyphosate, Oxamyl (Vydate), Picloram, Simazine, 2,4-D Pentachlorophenol, 2,4,5-TP (Silvex)	Cancer, nervous and reproductive system, respiratory system, liver, heart, and kidney	herbicide for corn, soybeans, sugar cane, and wheat; pentachlorophenol was also used as a wood preservative

Identifying Common Home Water Problems

While most homeowners may never encounter scary-sounding contaminants like toxaphene and trichlorethylene, there are several common water problems to be on the lookout for in the home.



HARD WATER

Symptoms: Hard water is easy to spot; it leaves a bathtub ring made up of hardness minerals and soap. This scum collects on shower walls, clings to hair, clogs skin pores, and makes house cleaning difficult. Hard water deposits also can clog pipes, cause water heaters to operate inefficiently, and increase maintenance on water-using appliances.

Cause: Hard water is created when water passes through rock formations and picks up calcium and magnesium.

Rx: Water hardness is corrected by the use of a water softener/conditioner. The hard water passes through a tank containing resin beads holding “soft” sodium ions. The “hard” calcium and magnesium ions are exchanged for sodium ions, thus softening the water. When the beads have trapped all the hardness they can hold, the unit is regenerated (recharged) with salt brine to replace the hardness ions with sodium ions. The unit is then ready to soften water again.



IRON WATER

Symptoms: Iron water is easy to detect; it may leave iron stains on sinks, clothing, and linens, or it can form scale in pipes and water-using appliances that make water look and smell bad. A water-testing professional can determine how much iron is present in a home and which type of iron it is:

- Clear water iron – Water is clear when drawn from the tap; it turns red after standing for a time as the iron mixes with the air and oxidizes.
- Red water iron – Water is red when drawn from the tap; the iron has already oxidized in the ground, well, or water system.
- Bacterial iron – Water has slimy rust or yellowish globs in it. The cause is bacteria in the water that feeds on iron. While the bacteria is not harmful to your health, it is unpleasant to look at and can clog plumbing.

Cause: Iron water is created when water passes through iron-bearing rocks in the earth. It can also be caused, usually temporarily, by water standing in iron pipes.

Rx: Small amounts of clear water iron can be corrected by a water softener. Red water iron and larger amounts of clear water iron can be controlled by running the water through a filter containing an oxygen-rich mineral. The mineral oxidizes the iron into solid particles that can then be trapped in the filter and washed down the drain. Extreme amounts of iron are best controlled by using a chemical feed system that puts chlorine into the water to oxidize the iron. To treat bacterial iron, the well and water system need to be “shocked” with heavy chlorination and then maintained by a filter or feed system.

ACID WATER

Symptoms: Acid water cannot be detected by the water's appearance, feel, or odor. Its symptoms, however, are very apparent in the home. Acid water, in conjunction with copper fittings and fixtures, can cause blue-green stains on plumbing fixtures, and eat away chrome faucets, fittings, and pipes. It can etch china and glassware, and corrode water-using appliances. A water-testing professional can test for the degree of acidity in a home's water supply.

Cause: Acid water is caused by water passing through extremely hard rock such as granite or marble. Water, by its nature, wants to dissolve materials through which it passes. If it cannot dissolve the materials, water comes into the home in a "hungry" state and starts eating away everything it

touches. The degree of problems experienced will be determined by the pH scale which measures acidity on a scale of 1 to 14. Water registering below 7 is acidic, at 7 is neutral, and above 7 is alkaline.

Rx: *Slightly acidic conditions can be controlled by running water through a filter tank containing a neutralizing compound. More extreme conditions can be controlled using a chemical feed system that injects a liquid neutralizer into water. Also, a phosphate feeder can be used to coat all water-bearing surfaces with a film that helps eliminate acidic damage.*



TURBIDITY

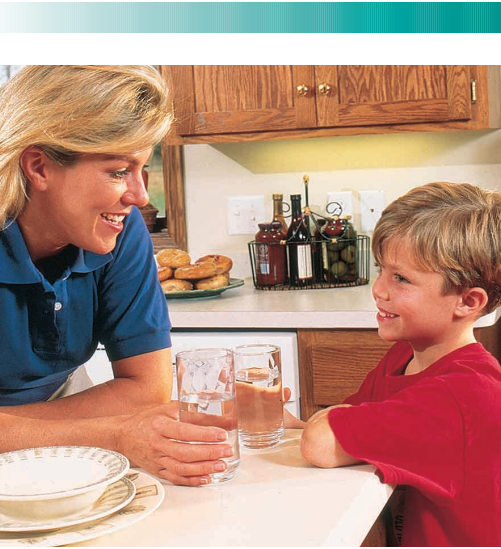
Symptoms: Turbidity is simply dirt or other suspended materials in water. You can detect turbidity by visual inspection. In addition to being unpleasant to look at, it can clog small water-bearing openings and cause wear on valves, seats, and washers.

Cause: Turbidity is caused by dirt and sand getting into wells, or by run-off of other organic matter into water supplies.

Rx: *Suspended materials in water can be trapped in a tank filter containing a bed of filtering media. Small amounts of turbidity can be handled with a cartridge filter designed for removing sediment from a water supply.*



Identifying Common Home Water Problems

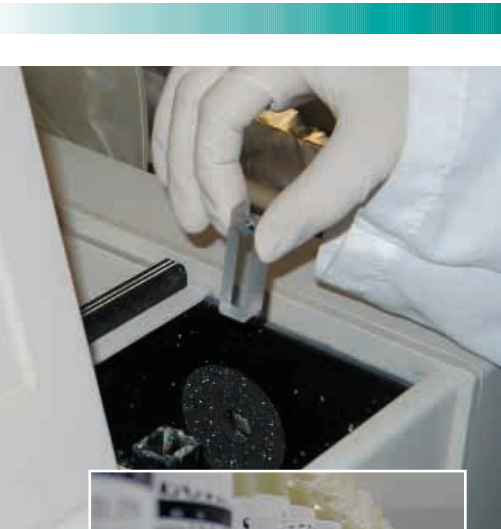


TASTE AND ODOR

Symptoms: Tastes and odors in water do not normally cause physical problems in the home but can be very objectionable.

Cause: Tastes and odors are caused by many things including chlorine, chlorine compounds, decaying organic matter, and dissolved gases or minerals. The presence of hydrogen sulfide, which tastes and smells like rotten eggs or sulfur, is caused by decaying vegetation and oil deposits beneath the earth's surface.

Rx: *Common tastes and odors can be easily treated by a tank filter containing activated carbon. The carbon absorbs the tastes and odors. Minor problems can be treated by a single-faucet filter. Hydrogen sulfide is a different problem requiring a different type of treatment. Low levels can be treated with an iron filter, followed by a water softener. High levels require a chemical feed pump followed by a turbidity filter.*



CONTAMINANTS

Symptoms: Drinking water contaminants cannot be detected except by professional testing.

Cause: Drinking water contaminants are either naturally occurring or man-made. See the EPA Water Contaminant Chart for specific causes.

Rx: *Depending on the type and amount of contaminant, there are various methods of treating water, including sediment filters, taste and odor filters, chemical contaminant filters, lead reduction filters, reverse osmosis drinking water systems, and distillers.*



Detecting Problems Through Water Testing

While some common home water problems can be visually detected, others need to be identified and/or measured through water testing.

IN-HOME TESTING

With a brief home visit, water treatment professionals can easily detect many water problems caused by nature. They are trained to spot symptoms of certain water problems and, with the help of a portable testing lab, to measure levels of contaminants.

The most common in-home water tests are for hardness (measured in grains per gallon), iron (measured in parts per million), acid, chlorine, nitrates, and total dissolved solids. Water suspected to contain bacteria must be tested by a laboratory.

LABORATORY TESTING

In cases where laboratory testing might be required, water samples can often be mailed to a lab or submitted by a water treatment professional. To locate a reputable water testing lab, homeowners can look in the Yellow Pages under *Water Analysis, Water Testing, or Lab, Testing*. Or, they can contact the state Department of Health for a list of certified labs nearby.

For other water-related questions, call the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791, weekdays between 9:00 a.m. and 5:30 p.m. EST., or visit their web site at www.epa.gov/safewater.



Who Is EcoWater Systems LLC?



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is to become recognized as the most customer-conscious, highest-quality, lowest-cost producer in our industry.

OUR VALUES...

include quality in our products and services, a passion for customer satisfaction, mutually beneficial relationships with customers and suppliers, teamwork in achieving our corporate goals, and uncompromising integrity in our business conduct.



CRITICAL FACTORS...

in accomplishing our mission are people, products, and profits. Our people must be committed to competitive excellence, our products must be state-of-the-art and meet or exceed customer needs, and our profits must be reinvested for future growth.

With more than 80 years of industry experience, EcoWater Systems has the products and knowledge to solve most home water problems. Our products have earned the esteemed Good Housekeeping Seal. The company is registered to the ISO 9001 Standard for Quality Systems and provides the best warranty in the industry on all its water treatment products. EcoWater products are sold through more than 1,400 independent, authorized dealers in the United States, Canada, Europe, Asia, Middle East, and Africa.

For more information about EcoWater products and services or to locate the authorized dealer nearest you, call **1-888-WATER-OK (1-888-928-3765)** or visit **www.ecowater.com**.



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