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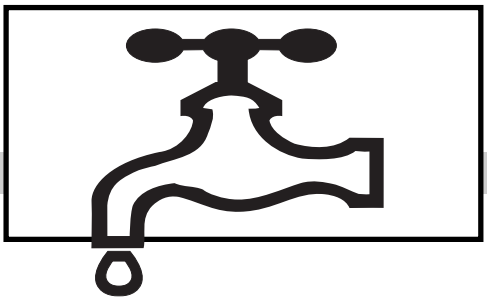

HOUSEHOLD WATER QUALITY

Home Water Quality Problems–Causes and Treatments

*Blake Ross, Kathleen Parrott, and Janice Woodard**

Many areas have water containing impurities from natural or artificial sources. These impurities may cause health problems, damage equipment or plumbing, or make the water undesirable due to taste, odor, appearance or staining. Water-related problems will be found primarily in homes serviced by a private water supply, although occasionally, they will be found in water from municipal water supplies. Those impurities which cause health problems should be attended to immediately; other problems caused by water impurities can be corrected if they are a nuisance. Before beginning any treatment plan, have water tested by an independent laboratory to determine the specific impurities and level of contamination. This will help you select the most effective and economical treatment method.

SYMPTOMS	PROBABLE CAUSES	SUGGESTED TREATMENTS
Intestinal disorders. Water may or may not have "off" taste or odor.	**Contamination due to surface run-off** containing fertilizer, pesticides, or manure. Unprotected plumbing cross connections. Sewage infiltration.	Disinfect water supply with strong chlorine solution and install automatic chlorinator if appropriate. Install check valves or other protection at cross connections and maintain air gaps between faucets and any possible source of contamination
Soap doesn't lather well. Greasy, grimy rings in tubs and sinks. Dingy laundry with a harsh feel and possibly white or gray streaks. Milky film or spots on dishes washed in automatic dishwasher. Scale build-up in water heater. Scale build-up in pipes and reduced water flow.	**Hard water** due to calcium and magnesium compounds dissolved from rocks and minerals in the earth. The most commonly used description is: 0 to 3 1/2 grains per gallon (0 to 60 milligrams per liter or parts per million) = *Soft*: 3 1/2 to 7 grains per gallon (60 to 120 milligrams per liter or parts per million) = *Moderate*; 7 to 10 1/2 grains per gallon (120 to 180 milligrams per liter or parts per million) = *Hard;* over 10 1/2 grains per gallon (over 180 milligrams per liter or parts per million) = *Very Hard*	Install a water softener bypassing outside water lines. Alternatively, soften water in washer, tub and basins by adding a packaged water conditioner. Special scale filters may be attached to the cold water supply lines to appliances. Softeners add sodium to water and may increase corrosivity, so you may prefer to bypass drinking water lines.

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SYMPTOM	PROBABLE CAUSE	SUGGESTED TREATMENTS
Reddish-brown stains in sinks, toilets, tubs, dishwashers, and dishes. Reddish-brown stains or yellowing of laundry, especially after using chlorine bleach. Water tastes metallic. Brown sediment in standing water. (See also *reddish slime*.)	**Dissolved iron** in the water that is oxidized by air to form iron oxide, which is insoluble. (See also *iron bacteria*.)	After determining type and amount of iron problem, select appropriate iron removal equipment such as chlorinator and sand filter, high capacity water softener or manganese greensand filter. Choice of treatment for iron problems can be complex, depending on the level of iron in the water and the presence of other impurities.
Reddish slime on walls of toilet flush tank and reduced water flow. Slimy material suspended in clear water.	**Iron bacteria,** which live on iron in the water and eventually harden into scale.	Install a chlorinator to feed into the well near the pump intake and an activated carbon filter to remove excess chlorine and other objectionable tastes or odors.
Corroding water pipes. Water dripping from corroded iron or galvanized pipe has a rusty color. Corroded copper or brass pipes cause blue-green stains on plumbing fixtures. Laundry may have red, reddish-brown, or blue-green stains. Metallic taste.	**Low pH**, commonly called acid water; often caused by a high concentration of carbon dioxide. Water softeners may increase the corrosiveness of acid water.	Depending on the acidity level, use appropriate treatment such as aeration, soda ash feeder, or neutralizing filter.
Rotten egg odor. Copper and silver turn black in the water. Iron, steel, or copper parts of pumps, pipes, and fixtures corroded. Black stains on laundry and porcelain. Black particles in water.	**Hydrogen sulfide,** sulfate reducing bacteria, or sulfur bacteria.	Compounds such as iron sulfide, calcium sulfide, and sodium sulfide can interfere with hydrogen sulfide removal so multiple treatments may be required. Appropriate treatments include chlorination or aeration followed by filtration through a sand filter.
Objectionable taste or odor other than hydrogen sulfide.	**Decaying organic matter,** pollution from surface drainage, insufficient chlorine being used to disinfect water.	Install activated carbon filter or automatic chlorinator followed by activated carbon filter.
Turbid, cloudy or dirty water. Dingy laundry.	**Silt, sediment, small organisms or organic matter,** suspended in the water.	Install a fiber or a sand filter.
Black stains on sinks, tubs, and laundry. Water may feel greasy.	**Manganese** (often appears with iron).	Iron removal treatment also removes manganese.

The problems listed above are not the only ones possible. Other impurities such as nitrate, lead, fluoride, pesticides, and chloride may contaminate water with or without visible symptoms. If there is reason to believe your water may have been contaminated and is dangerous, or if impurities are simply a nuisance, have the water analyzed, read the report carefully, and take appropriate action. Always select water treatment equipment from a reputable and knowledgeable dealer. Contact your local Cooperative Extension office for additional information and publications on water quality.

Adapted from a publication by Ann V. Beard and Susan Quiring of the Texas Agricultural Extension Service.