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## **WATER ANALYSIS**

Domestic water is generally supplied to homes through private well or public water companies. Water supplied by public water companies is usually safe to drink and does not pose a health risk. The quality of the water supplied by these companies is periodically checked because it must comply with rigid standards set by the U.S. EPA. Water supplied by a private source is also usually safe to drink; however, it can be contaminated by harmful bacteria resulting from faulty septic tanks, chemicals from a toxic spill that occurred years before, leaking underground storage tanks, or pesticides and fertilizers. The only way to tell whether the water is potable is to have it tested.

Generally a conventional loan for a property with a private water source will require only a coliform bacteria test be completed. Concerned bUVers may also choose to have other water testing done in addition to the coliform bacteria test. These additional tests may include any of the following: pH, Nitrates, Nitrates, Iron, Copper, Detergents, Hardness, Lead, or Volatile Organic Compounds (YOC's). YOC's are generally conducted only if there is concern that a landfill and/or industrial contamination is known to exist in and around the property. For FHA loans the following private water source tests will be required: Total Coliform Bacteria, Fecal Coliform Bacteria, Nitrates, Nitrites, Total Nitrites/Nitrates and Lead. For VA loans the following private water source tests will be required: Total Coliform Bacteria, Nitrates, Nitrites, Total Nitrites/Nitrates, Iron, Total Dissolved Solids, and Hardness. Typical costs for a Coliform Bacteria test range from \$45-\$75. Typical costs for the FHA/VA water series range from \$80-\$160. A lead in water test is required for all FHA loan and costs range from \$40-\$80 for this test.

### ***Total Coliform Bacteria (TC)***

Most coliform bacteria do not cause disease, but they are present in the intestines of all warm-blooded animals. Therefore, if these bacteria are present in a water supply, sewage or manure may be contaminating the water. The prescribed limits for coliform bacteria are zero colonies/100ml. In layman's terms, anything reading over zero is not acceptable and must be corrected. Important to note: FHA loans allow up to 10 colonies/100ml before any remediation needs to be taken. In many instances when a bacteriological test indicates that water is contaminated with coliform bacteria, the source of the pollution may be temporary and contamination can be eliminated through shock chlorination. The source of pollution, if it can be identified, must be eliminated. It may be necessary to extend the well casing above the surface of the ground, divert surface runoff away from the site, and install a sanitary seal in the open end of the casing. Shock chlorination can be accomplished by mixing a strong chlorine solution with the water in the well and letting it stand for a few hours. A copy on how to shock a well can be obtained from Homechek, Inc. Shocking a well is a temporary treatment, and may not always put an end to the bacteria contamination. A bacterium retesting is recommended at least twice a year.

A faster and more complete method to disinfect coliform bacteria from water is the Ultraviolet light (UV). The equipment consists of ultraviolet light tubes encased in steel cylinders or disinfecting chambers. Water enters a cylinder at one end, passes through it, over and around the UV tubes, and out the opposite end. Bacterial organisms exposed to the UV light are destroyed or inactivated. Unlike chlorination, there is no taste or odor imparted to the water and there is no measurable residual of any description that can assure that water thus disinfected will remain safe for human consumption. Most

ultraviolet units are easy to install and maintenance on them is minimal. Typical costs for a UV light to be installed range from \$600-\$1000.

### ***pH***

The pH test determines the acidic or alkaline content of your water and often directly affects other parameters in the chemical test. Water with a pH less than 6.5 or greater than 8.0 may cause pipes to corrode and release metals into the water such as copper, lead, and zinc. A high copper content can cause nausea and associated symptoms, while lead has frequently been proven to be a poison. An Acid Neutralizer is the device used to correct a pH problem in the water. Typical costs for an Acid Neutralizer to be installed range from \$700-\$1200.

### ***Iron (FE)***

A high concentration of iron gives water a metallic taste, stains clothing and fixtures, and promotes the growth of iron bacteria in the water system. The limit set for iron in water is 0.3 milligrams per liter. An Iron Filter is the device used to correct high iron content in water. Typical costs for an Iron Filter to be installed range from \$1200-\$1800

### ***Nitrites (NO2)***

Nitrites are an intermediate oxidation state of nitrogen. Such oxidation may occur in runoff from fertilizer use, leaching from septic tanks, sewage, and erosion of natural deposits. Nitrite is the actual etiologic agent of methemoglobinemia (blue baby syndrome) in infants and ruminant animals. If drinking water contains excessive nitrates, do not give the water to infants under six months of age, or to pregnant women. Do not use the water to prepare infant formula. Boiling the water will only increase the nitrate concentration. A Reverse Osmosis or an Ion Exchanger is the device used to control high nitrates in water. Typical costs for a Reverse Osmosis to be installed range from \$1000-\$1800.

### ***Nitrates (NO3)***

Nitrate contamination of drinking water is important because of its effect on human and livestock health. Excessive concentrations of nitrate can cause methemoglobinemia (blue baby syndrome) in infants and ruminant animals. To protect people and livestock, a water quality standard of 10 milligrams per liter nitrate nitrogen has been set human consumption and 100 milligrams per liter for livestock. If drinking water contains excessive nitrates, do not give the water to infants under six months of age, or to pregnant women. Do not use the water to prepare infant formula. Boiling the water will only increase the nitrate concentration. A Reverse Osmosis or an Ion Exchanger is the device used to control high nitrates in water. Typical costs for a Reverse Osmosis to be installed range from \$1000-\$1800.

### ***Copper (CU)***

The formation of copper in water occurs during corrosion of interior household and building pipes. Copper amounts are worse in water where the pH is in the acidic range. Levels of copper in water exceeding 1.0 milligram per liter can result in a number of complications. These complications may include Wilson's disease and many other stomach and intestinal problems. An Acid Neutralizer is the device used to correct high copper content in water. Typical costs for an Acid Neutralizer to be installed range from \$700-\$1200.

### ***Total Dissolved Solids (TS)***

Levels for total dissolved solids in water have been set at 500 milligrams per liter.

### ***Hardness***

The hardness of water is defined in terms of its ability to produce soapsuds. Water that is too hard requires large amounts of laundry soap and can cause a whit film to develop on the skin and plumbing fixtures, while water that is too soft creates difficulty in rinsing soap from laundry and causes a slippery feeling when bathing. Hardness has also been linked to calcification of the brain and kidney stone development. Limits on water hardness are set to personal preference. The most common method of water softening for an individual water system is the ion-exchange material used in water softeners.

Water softeners are available as fully automatic, semi-automatic or manual units. Typical costs for a Water Softener to be installed range from \$500-\$1000.

### ***Lead (PH)***

The EPA has indicated that some 40 million people have been using drinking water containing potentially hazardous levels of lead. The problem does not originate with the water supply but with distribution piping, solder used at the pipe fittings, and fixtures in the house. In some older homes the inlet water pipe is made of lead; the solder used on pipe fittings in homes built before 1988 contained lead; and lead is contained in the metal alloy used in the manufacture of man faucets. The most important factor causing a high concentration of lead in water is the contact time between the water and the lead. Water that is slightly acidic or soft (water that makes soapsuds easily) is corrosive and reacts with lead. When the water stands in pipes or faucets that contain lead for several hours without use, there is a potential for lead to leach, or dissolve, into the water. The current federal standards limit the amount of lead in water to .015 milligrams per liter. An Acid Neutralizer is the device used to correct high levels of lead in water. Typical costs for an Acid Neutralizer to be installed range from \$700-\$1200.