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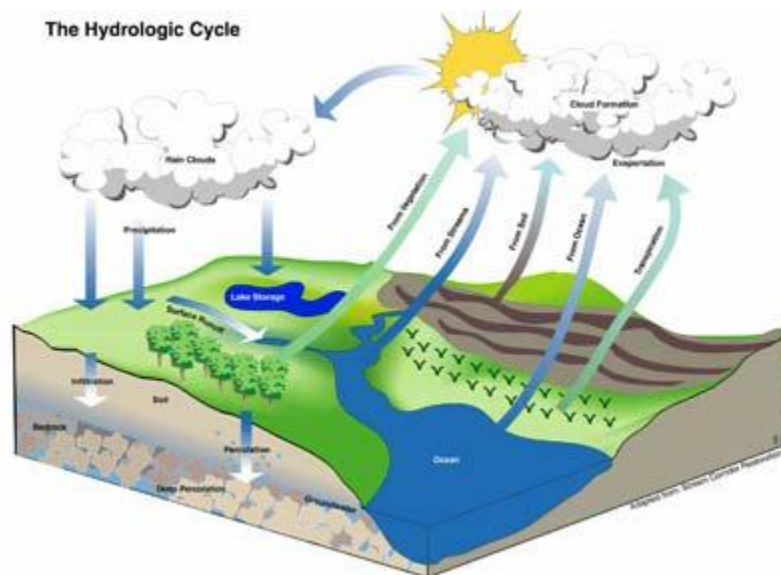


Patent Pending Water Softener and Sulfur (Hydrogen Sulfide) Removal System

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Water Conditioning & the Hydrologic Cycle



The Hydrologic Cycle or Water Cycle (sometimes called the Hydrological Cycle) is the natural process of circulating water within the Earth's hydrosphere and is driven by solar radiation. Water is transferred around our planet in this continuous cycle and changes between being a solid, a gas or a liquid. This cycle has the physical processes of Evaporation, Transpiration, Condensation, and Precipitation. Once the precipitation falls to earth - it takes the form as Runoff, Percolation, and then Groundwater and the Water Table. This water finds its way by gravity to streams, lakes, oceans – or into your home by means of an electric submersible or jet pump if you are on a well system. Groundwater can be thousands of years old, and because of that, it has had plenty of time to dissolve

all kinds of contaminants. Most of these natural “contaminants” are not harmful to humans, but can wreak havoc on a household plumbing system. The following is a basic explanation of the most common aesthetic water quality problems.



What is commonly called “hard water” are naturally occurring salts of calcium carbonate and magnesium carbonate. These minerals were originally termed “hard” because washing clothes and bathing in this water is difficult, creating nothing but soap curd and no lather to speak of. Drying out of skin because of soap residue is also a problem. Once modern plumbing systems were developed, hard water became a nuisance by clogging pipes and scaling up water heaters. Water that tests above 7 grains per gallon (119.7 ppm or mg/l) is considered hard enough to require a water softener.



Iron Water or “Irony Water” is one of the most common and difficult problems to treat without the proper methods. There are five (5) types of iron found in groundwater, these are: Clear Water (ferrous), Red Water (ferric), Bacterial (Crenothrix, Leptothrix, Gallionella), Organic (Tannin, Heme, Complexed, Pink), and Colloidal Iron. The most common forms found in Maryland and the surrounding areas are Clear and Red Water Iron. Because it only takes 0.3ppm-mg/l of iron to stain household fixtures, only highly qualified water treatment technicians can recommend the proper treatment methods.



“Sediment” in water range from grit you can see that sinks to the bottom of a glass in seconds, silt that can stay suspended in water for hours, to totally turbid water (called sub-micron turbidity) that stays cloudy and will never settle-out. This water quality problem can also be caused by a failing well system or the well pump to close to the bottom. This much grit will wear out plumbing fixtures in no time and can also clog pipes.



“Manganese” can be one of the most damaging of all water quality problems because it turns everything black. It takes only 0.05ppm-mg/l of this element to be noticeable and cause staining of sinks, bathtubs and other plumbing fixtures. Special treatment methods are needed to combat this problem.



“Acid Water” is one of the most common and overlooked water treatment issues. Only until a customer starts to find pinhole leaks in their copper pipes around the house, or fixtures with blue green stains that can't be removed, do they call us and ask for help. If your house was built before about 1985, you may also have a potential lead problem. That was when lead solder for copper piping was outlawed and only lead free solder was permitted for new house construction. Also most counties in the State of Maryland now require a “first draw” lead test (water that has been sitting in pipes untouched for 12 hours or more) before a house can be sold. Acid water by itself is harmless and is a ph of less than 7.0; carbon dioxide is also a factor in the aggressiveness of the water. It is the substances dissolved by this “hungry” water that can be a health

concern.



“Sulfur Water” or water that smells like “Rotten Eggs” is a colorless gas that can be very repulsive to a homeowner. It comes and goes for no particular reason and is usually the worst after the water sits unused (like in the morning shower) and is strongest on the top floor baths. It is no more than smelly “marsh gas” called Hydrogen Sulfide, and it is only harmful in very high concentrations. A variety of treatment methods are available including chlorine feed pumps, aeration, and specialty catalyst materials. Sulfur Water is sometimes mistaken for iron bacteria, because they both smell nearly the same; this requires an experienced water conditioning professional to recommend a proper solution.