Emerging Drinking Water Risks

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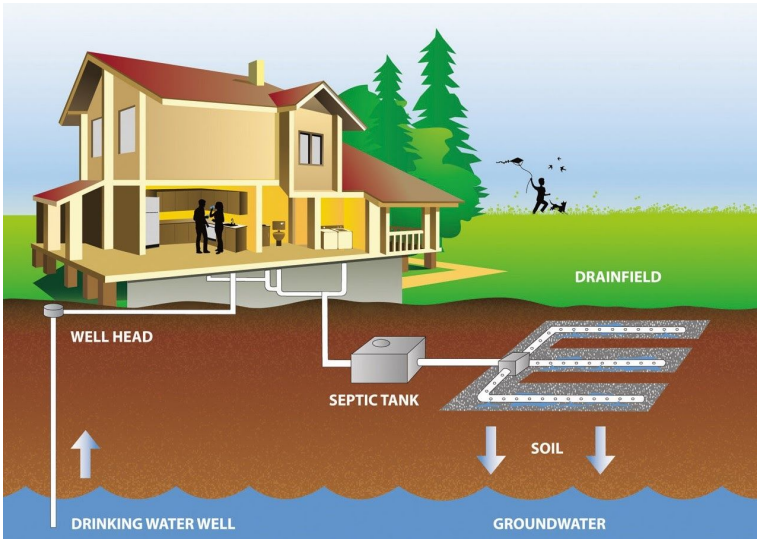
Perspective

As there is an increase in conducted research, new findings are becoming apparent regarding the potential for new or emerging contaminants in water posing risk to human health. Contaminants of Emerging Concern (CEC's) are usually not monitored or tested for in municipal drinking water or by rural health units as a part of standard health unit sampling. These potentially harmful CEC's are commonly found in the waste water from municipal treatment plants and can be found in private septic systems within rural areas.

Definition

CEC's are synthetic or naturally occurring chemicals or any microorganisms that are not commonly monitored but have the potential to cause known or suspected adverse ecological and/or human health effects.They consist of, but are not limited to; pharmaceuticals, pesticides, industrial chemicals, cleaning detergents and personal care products that are consistently found in various important sources. These include groundwater, surface water, municipal wastewater, drinking water, and a variety of food sources. Medications, antibiotics, hormones, endocrine-disrupting compounds and other pharmaceutical compounds including anti inflammatory, antidiabetic, and antiepileptic drugs are classified as CEC's as well. PFAS and PFOS are a group of man-made chemicals that are very persistent in the environment and in the human body – meaning they don't break down and they can accumulate over time. There is evidence that exposure to PFAS can lead to adverse human health effects.



Commentary

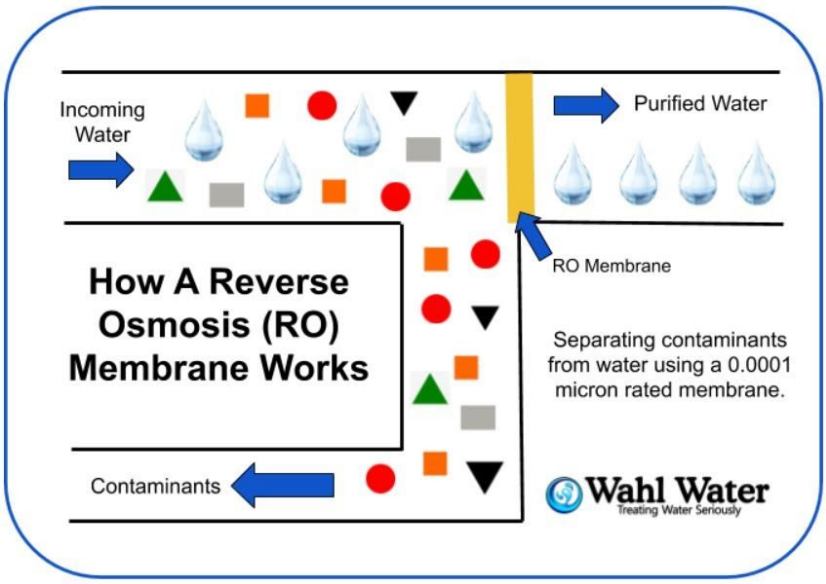
Typically entering via wastewater discharge, CEC's are transferred into drinking water systems as water moves beneath the surface into aquifers, and above the surface in lake water sources. The number of potential CEC's present in a water supply provides a significant challenge when testing each contaminant individually. When two or more contaminants combine, testing becomes almost impossible due to the complexity of compounds.

So how is it we know if a contaminant is present when no testing occurs, or a test for the contaminant is nonexistent with today's methods? The simple answer is: It is not possible. To achieve identification of CEC's, it is important to understand its origin source. Prevention technologies at these origin sources are critical to ensure that the least amount of a contaminant enters a water supply. However, this method is not failproof, and can never eliminate the risk entirely. Now, more than ever is safe drinking water is a necessity for every individual. There is tested and validated technology which can separate contaminants and provide safe drinking water

at one or more designated taps in your home. The complexity of contamination has reached a point where it is not realistic to expect every tap in our homes to be safe for drinking.

Drinking Water Solutions

Reverse osmosis (RO) involves the production of treated water passing through a semipermeable membrane, removing ions, molecules, and larger particles of harmful contaminants from the water. To help comprehend the scope of this, the human eye is able to see about 20 microns with standard 20/20 vision. The reverse osmosis membrane is rated at 0.0001 microns and according to the World Health Organization is “able to achieve higher removal rates (above 99%) for targeted pharmaceutical compounds in various studies in the published literature”.



For many years now, I have used a very simple analogy of how the technology works: It is like trying to force a transport truck through the eye of a pin. Water is known as the universal solvent, and will break down to a very small size entering through the membrane. The contaminant is “rejected upon entry”, as it cannot break down. It is too large and will not “fit” through. This process is non selective and thus effective at removing and reducing the presence of a large amount of contaminants.

Other types of water treatment equipment such as ultraviolet systems (UV), softeners, fridge filters, etc have their place to perform other types of treatment, but they cannot perform the same level of contaminant reduction. In addition, RO systems also reject chlorine, lead, total dissolved solids, copper, salts and various other contaminants including micro fibres and micro plastics.

Best Practice Recommendation

It is impossible to know exactly what is in a water source at any given time. Regulations are designed to treat what is known and prevent harm. There are far too many contaminants to effectively regulate, test and provide 100% safe drinking water from every tap. In my experience, the evidence of the overwhelming unregulability of these contaminants lies in the constant emergence, worldwide, of new studies and publications regarding water quality and contamination.

Think about water sources that have not been tested, and the contaminants we remain unaware of? Water treatment professionals know and promote that drinking water should be separate from the rest of the water in a home. No one really knows what actually lies in our drinking water, and no single test exists to test for every possible contaminant.

My recommendation is a reverse osmosis drinking water system which can provide the highest level of drinking water safety in a wide variety of applications.