

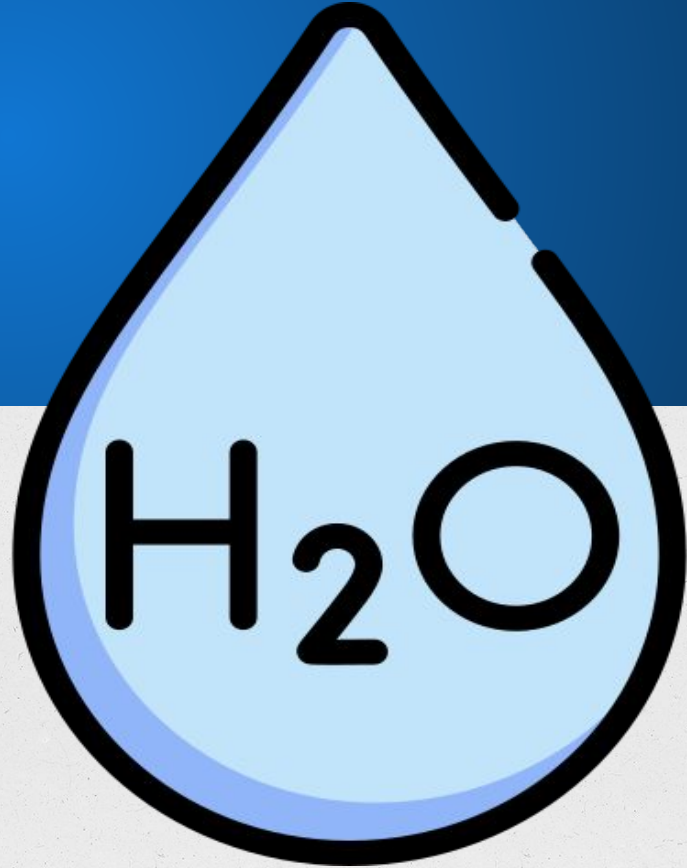
# Fundamentals of Water

Maxamillian Comerford - CEO/Founder

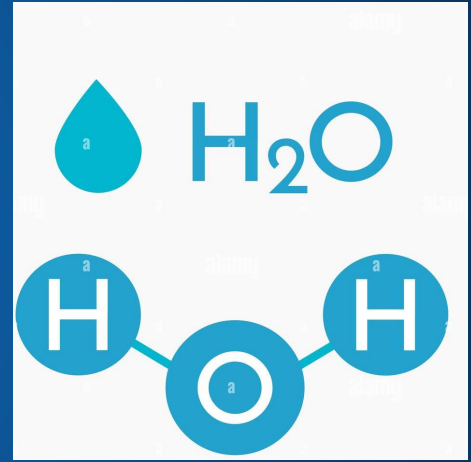
Soft, filtered, conditioned water saves money and will ALWAYS pay for itself over time.



*The set up !!!*

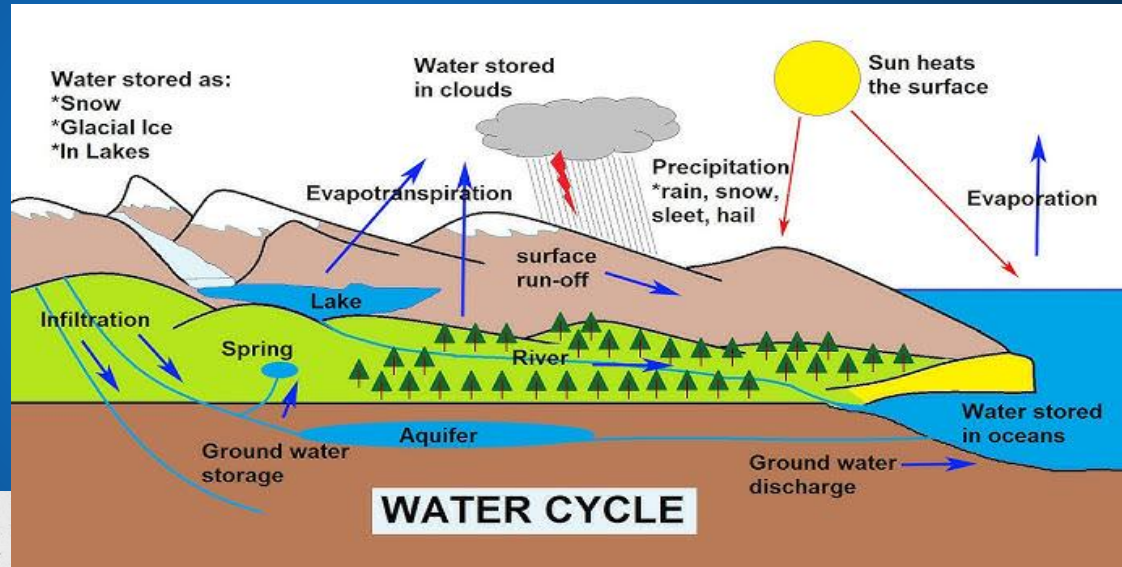


# What is Water Anyway??



Water is a molecule composed of two atoms of hydrogen and one atom of oxygen (H<sub>2</sub>O). In its pure form, it is a transparent, odorless, and tasteless liquid in lakes, rivers, aquifers and oceans.

# Where does it come from???



Water was formed in nature and cannot be manufactured or reproduced. Every drop on earth has been here from the beginning of time and recycles through the hydrological cycle. As it passes through underground aquifers and collects in lakes, rivers, and oceans, it evaporates forming clouds and falls to the earth as rain or snow (precipitation).

We harvest water from surface impoundments (lakes and reservoirs), rivers oceans, and forms underground aquifer wells!

# How Does Water Become Contaminated?

**Water the Universal Solvent** - H<sub>2</sub>O is a neutral and has great solvency properties, always dissolving and absorbing whatever it contacts

**Common Contaminants Found in Drink Water** - When we drink our daily eight glasses of refreshing, nourishing water, how often do we consider the huge host of contaminants living inside our tap water?

- Nitrates
- Arsenic
- Microorganisms, Bacteria, & Viruses
- Aluminum
- Fluoride
- Lead
- Ammonia
- Pharmaceuticals
- Pesticides/Herbicides

# How Does the Environment Affect Water?

As water falls from the sky it passes through airborne contaminants: gasses and particulate.

- Carbon Dioxide
- Smoke
- Soot
- Sulfur Oxides
- Pollen and more...



As water comes in contact with earth, it continues to dissolve and absorb whatever it contains: minerals, salts, heavy metals, and microorganisms.

- |             |                    |
|-------------|--------------------|
| • Calcium   | • Sulfur           |
| • Magnesium | • Bacteria         |
| • iron      | • Cysts            |
| • Nitrates  | • Radon            |
| • Arsenic   | • Mercury and more |

# Contaminant Characteristics

Typically, unwanted items in water are unhealthy and make water either inefficient or unusable, reducing water's ability to perform its intended use.

- Water contaminants fall into two categories :

## TSS(Total suspended solids)

- Particulates in water that are not dissolved
- they can be trapped and filtered out by mechanical means.
- Exceed 2 microns in size
- Examples: sand, silt, clay, and algae

## TDS(Total Dissolved Solids)

- Minerals, Metals, Organic matter's that are dissolved in solution with water, smaller than 2 microns.
- Measured in ppm, mg/L.
- They can be removed by reverse osmosis or converted by ion exchange

For reference, a human hair is approximately 75 microns in diameter.

## Comparative Micron Sizes



# Units of Measure

1 ppm - mg/l

.001ppm - mg/l

One inch - 16 Miles

One inch - 16,000 Miles

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1 ppm - pg/l

One Heartbeat in 27 Years

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1 ppt - ng/l

One cent in \$10,000,000

One second in 32,000 years

# Municipally Treated Water/City Water



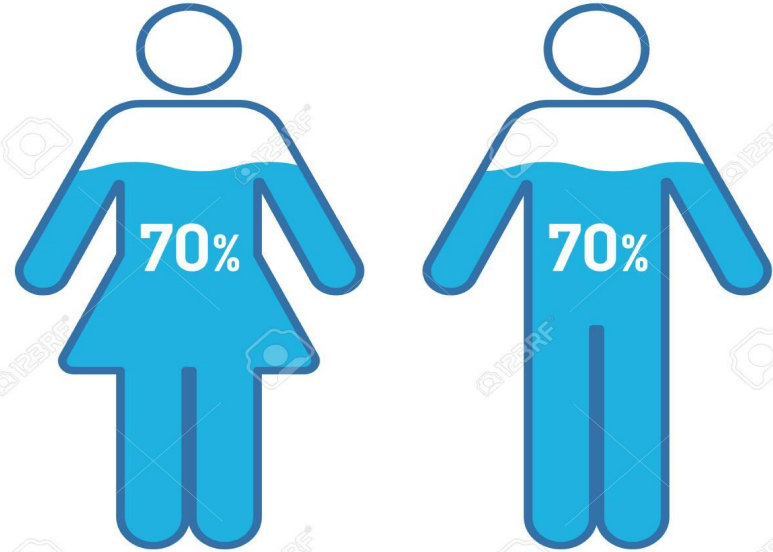
The U.S. has the safest drinking water in the world, But with a vast distribution system, the potential for contamination is very real!!

Remember the “Universal Solvent” properties of water? Once the water leaves the WTF (Water Treatment Facility) the whole process of absorbing whatever the water comes in contact with making the water at your faucet potentially much different than the water leaving the WTF. in addition, it contains chlorine or chloramine content for disinfection as well as Fluoride.

Typical causes for contamination on route to your home: pipe repairs and maintenance, power outages, leaks, corrosion, leaching from pipe walls, disinfection by products, biofilms, and more.

Why is Clean,  
Pure, Soft, Safe  
Water  
Important??

## HUMAN BODY WATER LEVEL



# What is “The Final Barrier” and Why?

Only about 1% of water treated by municipalities is consumed by people. The remaining 99% is “Working Water” used for irrigation, flushing toilets, firefighting, and industrial processes.

Final barrier treatment, the 1% we consume, can be economically to the highest safety levels at the “point of use”

## **Final Barrier Technologies:**

- Ion Exchange Water Softeners
- Reverse Osmosis
- Activated carbon filtration
- Catalytic carbon filtration
- Distillation
- Sediment micron filtration
- Multiple combinations of Technologies

# Private Well Water

Private water wells have their own set of challenges and require a more comprehensive testing procedures and treatment technologies.

## Potential Contaminants:

- Iron
- Bacteria
- Chemicals from agricultural run-off
- Sulfur
- Microbial
- Organics
- Tannins
- Nitrates
- elevated or reduced pH



# Water Falls into here Categories

## Life Support:

- Drinking
- Food Preparation

## Working Grade:

- Bathing
- Washing

## Appliances

- Hot Water Heaters
- Clothes Washing Machines
- Dishwashers



## Utility Grade:

- Irrigation
- Industrial Processes
- Firefighting



# What Is Hard Water?

Hard water is a common quality of water which contains dissolved compounds of calcium, magnesium, iron, and sometimes divalent and trivalent metallic elements.

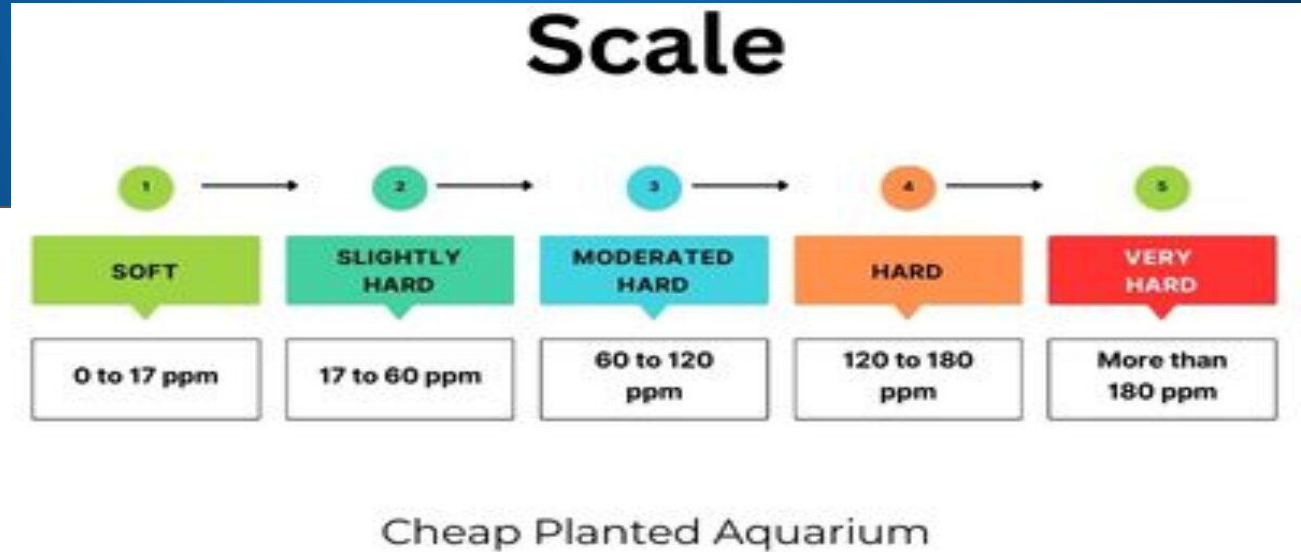
## **Scale deposits are a typical indicator of hard water.**

The term hardness was originally applied to water that was hard to wash, referring to the soap-wasting properties of hard water. Hardness prevents soap from lathering by causing the development of an insoluble, curdy precipitate in the water; hardness typically causes the buildup of hardness scale (such as seen in cooking pans). Dissolved calcium and magnesium salts are primarily responsible for most scaling in pipes and water heaters and cause numerous problems in laundry, kitchen and bath. Hardness is usually expressed in grains per gallon (or gpg) as calcium carbonate equivalent

## Systems include:

- Stiff and dingy laundry
- Mineral deposits on dishes and glass wear
- High speed soap & need for fabric softener
  - Dry, Itchy skin & scalp
  - Unmanageable hair
- Extra Work to remove soap curd on bathtubs and shower walls
- High energy costs, possibly due to scale build-up in pipes and on appliances
- scale build - up in sinks, tubs, faucets, and appliances

# How Do We Measure Hardness?



Hardness is measured by a titration process which measures calcium and magnesium in parts per million and divides by 17.1 expressed in grains.

# What Are Examples of What Hard Water Can Do?



# What is soft Water??

Water is considered Soft when dissolved minerals are removed to a level of 1.0 grain per gallon (gpg) or less. The most efficient and economical method is through ion exchange. Where the dissolved minerals (Calcium and Magnesium) ions are exchanged for sodium ion.

## **Why soft Water?**

Soft water provides both aesthetics and economic benefits. You will see, feel, and taste the difference

## **Aesthetics:**

- Improves taste and odor
- Removes cloudiness & discoloration
- Prevents staining
- Fluffer laundry
- Silkier shinier hair
- Softer and smoother Skin
- Sparkly glassware
- Spot free shower doors

## **Economics:**

- 75% less soaps & cleaning chemicals
- 20% less hot water usage
- 5% improvement in the life of plumbing and water appliances.

# How Do We Improve Water??

An example of what your system will look like!!!!

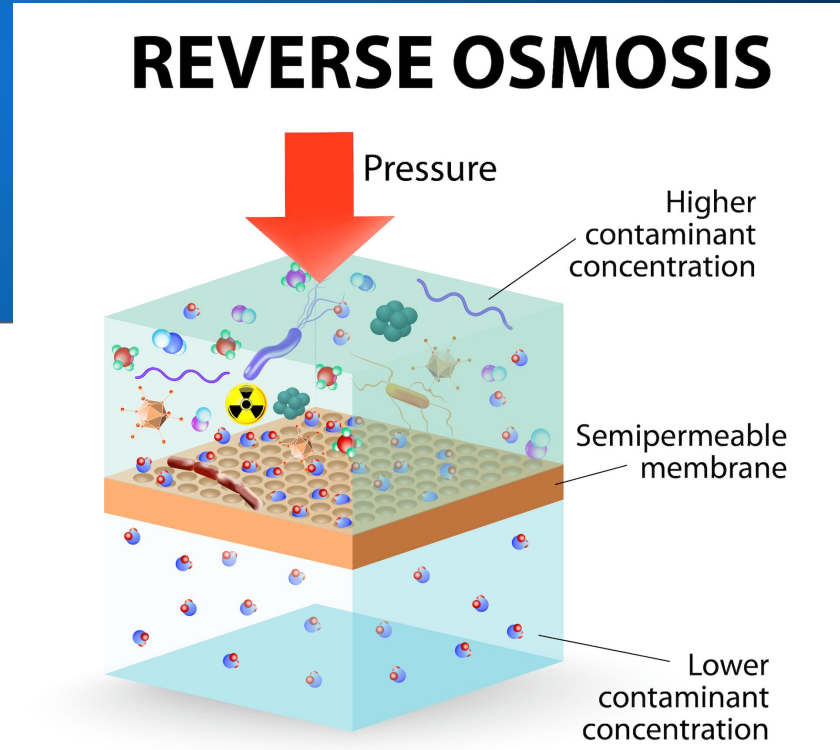
We have many proven and universally accepted methods to improve the quality of water. Most systems require multiple components to achieve the desired level. We have developed patented technology that removes contaminants, dissolved minerals, chlorine, and other undesirable in one compact, highly efficient component.



# Reverse Osmosis - How it Works...

Reverse Osmosis (RO) is a water purification technology that uses a semipermeable membrane to remove ions, molecules, and larger particles from drinking water. In reverse osmosis, an applied pressure of the fluid.

In the normal osmosis process, the feed water will go from dilute to higher concentration. By applying external pressure to reverse the natural flow of clean water is Reverse Osmosis.



# ProElite

## Features and Benefits

- Professional grade 1" control valve
- Intelligent programmable digital interface
- Three difference size systems for application flexibility
- Stylish enclosure that provides protection from rain and UV exposure
- Analyzer function monitors condition of bed in real time and eliminates human error
- High quality media is more resistant to degradation from water disinfection agents



# EcoPro

## Features and Benefits:

- Professional grade 1" control valve
- Intelligent programmable digital interface
- Simple elegant lines
- Flexible options for high efficiency or high capacity
- Integrated bypass with easy operations
- Internal metering system learns water usage patterns
- Interval service reminder
- Salt level indicator
- Blue lit a screen
- Upgraded 10% resin media



# FreshStream Reverse Osmosis Systems

## Features and Benefits:

- Purified water in your kitchen
- Proprietary twist-off filter cartridges
- High capacity 75 GPD TFC RO membrane assembly for easy replacement
- Ultra conservative 1:1 membrane system
- Quick Connect o-ring seal fittings
- Compact size takes less space that most systems



Soft, filtered, conditioned water saves money and will ALWAYS pay for itself over time.

|                         | % Savings | Monthly  |          | Yearly    |           |
|-------------------------|-----------|----------|----------|-----------|-----------|
|                         |           | Spending | Savings  | Spending  | Savings   |
| Bottled Water           | 100%      | \$33.33  | \$33.33  | \$400.00  | \$400.00  |
| Soaps                   | 75%       | \$10.42  | \$7.81   | \$125.00  | \$93.75   |
| Cleaning Products       | 75%       | \$50.00  | \$37.50  | \$600.00  | \$450.00  |
| Hot Water Usage         | 20%       | \$41.67  | \$8.33   | \$500.00  | \$100.00  |
| Plumbing and Appliances | 75%       | \$10.00  | \$7.50   | \$120.00  | \$90.00   |
| Clothing and Linens     | 30%       | \$43.75  | \$13.13  | \$525.00  | \$157.50  |
| Totals                  |           | \$189.17 | \$107.60 | \$2270.00 | \$1291.25 |

Potential 10-year savings =  
\$12,910.00