

# Let's get some water...



While nature provides water through precipitation — rain and snow — many of us depend on a complex infrastructure (without even thinking about it) of pipes, pumps, equipment and people to deliver clean water to local homes and businesses, remove used water from homes and businesses, and collect and clean water to maintain our quality of life and a healthy community.

While some water from sprinklers, rain and snow is absorbed into lawns and soil, what cannot be soaked up (including water runoff from roadways), enters the local stormwater system.

Water is available for household use in a range of ways — drinking/tap water, use in cooking, taking baths or showers, washing clothes or dishes, and flushing the toilet. Then, it enters the next step in the cycle.



**Water distribution system:** pipes and pump systems deliver clean water to homes/businesses.

**Water conveyance system:** each home/business is connected to a network of pipes and pump systems that sends "used water" to a wastewater treatment facility.

**The stormwater system** consists of pipes, ditches and natural structures that channel water back to the natural environments.

**REMEMBER:** What goes down the storm sewer ends up in local streams and waterways! Do not dump any materials other than water in it, including lawn clippings, grass fertilizer, paint, grease or other substances. Introducing these items into storm sewers can have severe, negative environmental consequences.

To protect against bacteria, chloramines are added before water flows into the distribution system so that it is clean and fresh for use.

Water is transferred to a second clarifier where CO<sub>2</sub> may be added, pH is balanced and remaining organic or sediment clumps are strained.

Raw water is drawn from fresh water sources to collect in pre-sedimentation holding basins.

Water is transferred to mixing basins where chemicals are added causing small organic particles to clump together.

Over time, particles become heavy, settle to the bottom of tanks and are strained out. To counteract calcium or magnesium, lime may be added, softening the water.

Water filters through layers of fine, granular materials or membrane filters. As smaller particles are removed, cloudiness diminishes and clear water emerges.

**Wastewater treatment process:**

water that is discharged into the pipe system for cleaning, typically enters the wastewater treatment process to remove waste and pollutants, and is disinfected before it is released back into a local rivers or streams.



Located at the beginning of the process, this treatment removes sticks, large trash, plastic items, rags and more.



The **primary settling tank** provides for the removal of heavy solids that sink to the bottom, as well as floating materials such as oil and grease.

In **aeration tanks**, air is introduced into the water where microorganisms use the remaining organic material and nutrients as their food supply.



**Disinfection** is part of the final treatment in wastewater plants. In some treatment plants, such as JCW-operated facilities, **ultraviolet light** is utilized to kill bacteria and viruses. Water passes through chambers with lamps exposing the water to high levels of ultraviolet light.

Some plants use a treatment with (most frequently) chlorine and other chemicals to kill disease-causing viruses and bacteria.



This secondary treatment allows microorganisms to fall to the bottom of the tank for recycling back to aeration or to be removed for use in the solids treatment process.



Solid substances go through additional treatment processes such as thickening, dewatering or anaerobic digestion.

Digestion helps stabilize biosolids so they can be recycled for beneficial usage such as agricultural fertilizer.

After the wastewater treatment process, **water can be reused** in a number of ways, returning it as good or better quality than the natural water source.