Protecting the environment and our community’s health

Colorado Springs Utilities
Wastewater Services
In 1924 the residents of Colorado Springs voted to create a four-service public utility. Since then, as a municipal utility, our focus has been on the basics, providing exceptional, reliable service while keeping costs reasonable.

Today, we continue to provide electricity, natural gas, water and wastewater services to the Pikes Peak region and our customers still enjoy competitive prices, hometown service, responsible environmental practices and a voice in how their utility operates.
Reliable and responsible
With so much taking place underground and behind the scenes, wastewater services are rarely given a second thought. More than the disposal of household and business waste, Colorado Springs Utilities’ complex system of pipes, pump stations and treatment facilities work in concert to ensure the health of our community.

We operate one of Colorado’s largest wastewater systems, providing reliable, environmentally-responsible wastewater collection and treatment services to more than 135,000 customers.

Know the Flow
A flush or swish and the water’s gone. So where does it go?

Ultraviolet disinfection – J.D. Phillips Water Resource Recovery Facility
Collection

After water goes down the drains in our homes and businesses, it enters the wastewater collection system and travels through a series of mains, known as interceptors. Wastewater is delivered to our water resource recovery facilities or treatment plants by gravity or by pumping at one of our 19 lift stations located around the city.

On any given day, more than 37 million gallons of wastewater flows through nearly 1,650 miles of mains. Our service territory encompasses Colorado Springs, from Northgate south to Cheyenne Mountain, excluding a handful of enclaves and metropolitan districts, for a total of 195 square miles.

Maintenance and improvements

Mains and interceptors are managed by our wastewater planners and maintained by our field crews. Preventative maintenance is regularly performed and system improvements are made to help protect our community’s health and environment. Employees are on call around the clock to respond to emergency events.

We use a variety of methods to manage the wastewater system:

- We clean more than one-third of the collection system each year.
- We help prevent infiltration and leaks caused by root growth by treating collection pipelines.
- Crews use closed-circuit TV to monitor and assess the condition of the pipes and to initiate necessary repairs.
- Utility specialists educate local restaurants and other businesses how fats, oils and grease, or FOG, can cause blockages in our community’s system.
Treatment facilities

Las Vegas Water Resource Recovery
The first facility of its type in Colorado Springs, the Las Vegas plant was established in 1930, with upgrades in the 1950s, 1970s, 1990s and 2000s. The permitted capacity of this plant is 75 million gallons per day. In addition to serving as our city’s main water resource recovery facility, the Las Vegas facility is also home to our water quality laboratories and industrial pretreatment management program.

J.D. Phillips Water Resource Recovery
Located at Garden of the Gods Rd. and Mark Dabling Blvd. near Pikeview Reservoir, the J.D. Phillips facility came online in 2007 to help meet the increasing service demands of the north and northeast areas of our community. The permitted capacity of this plant is 20 million gallons per day. The state of the art facility is fully enclosed to help control odor and is operated with a small staff.

Clear Spring Ranch Solids Handling and Disposal
Biosolids recovered from the Las Vegas and J.D. Phillips Water Resource Recovery Facilities are processed at this campus built in 1984 and located just south of the city of Fountain.

After traveling through a 17.6-mile long pipeline, solids are treated by an anaerobic digestion process for a period of about 20 days, at a temperature of 98F where complex organic substances are broken down into methane, carbon dioxide, trace gases and stabilized solids. Methane gas generated in the process is burned in gas boilers and used for digester heating. Biosolids are then stored in facultative sludge basins for up to 5 years for further treatment and then pumped from the basins and injected below the soil surface in fields.

An adjacent dam prevents any runoff or groundwater from leaving the disposal site. All liquids are contained on the site and are not conveyed to any external water sources.

It only takes about 37 employees to operate and maintain all three water resource recovery facilities, making operations very cost efficient.
Treatment

**Preliminary treatment**
This is the first step after wastewater enters our facilities. Step screens, which work like filters, remove larger debris such as rags and plastic. Following this step, grit chambers remove gravel and sand that may harm downstream equipment. The collected screenings and grit are loaded into trucks and disposed of at our Clear Spring Ranch Solids Handling Facility.

**Primary treatment**
The second step of the process is accomplished by slowing down the flow and allowing organic materials to settle out. Solids, along with grease and scum that is skimmed off the surface, is then removed for further treatment at our Solids Handling Facility.

**Secondary treatment**
During the third and most critical stage of waste treatment, bacteria and other micro-organisms are fed oxygen, allowing them to grow and consume the remaining organic materials. Some of these micro-organisms, called nitrifiers, convert ammonia to nitrogen gas that is released to the atmosphere, while others aid in removing phosphorous. Removal of organic materials, as well as the ammonia and phosphorous is a critical part of the process as it reduces the impact these substances have on our environment. The micro-organisms are then removed by means of settling, in a secondary clarifier, and are reused over and over again.
Disinfection

Ultraviolet light is applied during this phase, deactivating harmful bacteria from the treated wastewater. By using ultraviolet light for disinfection, we reduce costs and mitigate safety risks associated with traditionally used chlorine gas. We also improve our ability to meet evolving environmental regulations.

Discharge or reuse

Finally, treated wastewater – known as effluent – is ready for discharge into Fountain Creek. This effluent is cleaner than the water already in the creek. In addition, some of this water can be filtered and reused, for non-potable uses, such as irrigation at city parks and local golf courses, as well as at our cooling towers at the Martin Drake Power Plant.

To collect and convey the wastewater generated by the residential and commercial customers, Colorado Springs Utilities operates more than 1,650 miles of gravity main and 13 miles of force main. Nineteen lift stations are used to transfer wastewater to the treatment facilities.
Water quality

To ensure the effluent quality meets or exceeds permitted levels, staff routinely examines the effluent for a variety of parameters. Laboratory staff also periodically analyze Fountain Creek water samples to ensure the effluent does not negatively impact the ecosystem or downstream users. The treatment process ensures that final effluent meets or exceeds discharge permit levels set by the Colorado Department of Public Health and Environment and the U.S. Environmental Protection Agency.

Industrial pretreatment

Our industrial pretreatment program protects our wastewater collection system and treatment facilities, as well as the environment, by preventing toxic, dangerous substances from being discharged into the sanitary sewer collection system. In addition to issuing discharge permits, monitoring discharges, performing site inspections, and enforcing pretreatment standards and requirements, our experts help increase local awareness by educating businesses about program requirements.

Water reuse

Treated wastewater is returned to streams or reused in our non-potable distribution system. Wastewater that goes through additional treatment, including filtration, is delivered to our non-potable distribution system, where it is used to irrigate parks, golf courses, campuses and community properties, as well for our own utilities operations.

Improvements have maximized our use of non-potable water, including the conversion of the Drake Power Plant’s cooling towers to use non-potable water, which saves more than 1 billion gallons of drinking water per year.

Non-potable water development continues to play a critical role in water supply planning and management. Today, about 13 percent of our water portfolio is comprised of non-potable water.
Pharmaceutical and personal care products

Pharmaceuticals and personal care products, or PPCPs, are being discovered in our nation’s waters at very low concentrations. Pharmaceuticals are prescription and over-the-counter therapeutic drugs and veterinary drugs. Personal care products refer to products such as soaps, fragrances and sunscreen.

PPCPs enter the sanitary sewer system primarily through excretion of partially metabolized pharmaceuticals by the human body, and the disposal of unwanted medications and personal care products down the toilet or drain.

Research by the U.S. Environmental Protection Agency suggests that there may be some ecological harm when certain drugs are present; however, to date, no evidence has been found of human health effects from PPCPs in the environment.

Help limit what goes into our wastewater system by properly disposing of or recycling PPCPs. Look for information on our website at csu.org.

Nutrient removal

As technology evolves, so do the methods by which we measure wastewater quality. By 2019, regulators will require wastewater utilities to remove a larger percentage of nutrients, otherwise known as phosphorous and nitrogen, from treated wastewater.

Phosphorous and nitrogen, which are naturally excreted by the human body, and found in fertilizers and household cleaners, have been linked to algal blooms in waterways.

Meeting increased nutrient regulations will be a large and expensive undertaking by utilities around the United States. Because of the foresight of planners at Colorado Springs Utilities, we transformed the Las Vegas Water Resource Recovery Facility to advanced treatment capabilities in the early 1990s and built a second, state-of-the-art system at the J.D. Phillips Water Resource Recovery Facility in 2007, putting us significantly ahead of the curve in meeting future regulations.

FOG and “flushable” wipes

Liquid waste containing fat, oil and grease, known as FOG, that is sent down the drain can coagulate and congeal into a hardened layer on the inside of drain pipes and wastewater collection lines. FOG can accumulate on the inside of these wastewater pipes to such an extent that they become completely blocked.

Keep pipes clean by properly disposing of food waste, either in the trash or composting, when possible, and wiping grease from dishes before rinsing.

Avoid putting these foods down the drain:

- meats
- sauces
- gravy
- dressings
- deep fried foods
- baked goods
- cheeses
- stringy fruits and vegetables, such as celery and corn silks

In addition, so called flushable wipes aren’t flushable at all. They don’t degrade once they reach water and readily accumulate in pipes. Toss wipes in the trash to reduce the risk of backups.

Look for more tips at csu.org.
### Glossary of wastewater terms

**Activated sludge:** Sludge that has undergone flocculation, forming a bacterial culture typically carried out in tanks.

**Advanced wastewater treatment:** A process used above and beyond the typical minimum primary and secondary wastewater treatment.

**Aerobic wastewater treatment:** An oxygen dependent wastewater treatment used for aerobic bacterial breakdown of waste.

**Anaerobic wastewater treatment:** In the absence of oxygen, anaerobic bacteria breakdown waste.

**Bacteria:** Single cell microscopic living organisms lacking chlorophyll, which digest many organic and inorganic substances.

**Biosolids:** Rich organic material leftover from aerobic wastewater treatment.

**Biochemical oxygen demand (BOD):** Since oxygen is required in the decomposition process its demand, or BOD, is a measure of the concentration of organics.

**Clarifier:** A piece of wastewater treatment equipment used to clarify the wastewater, usually some sort of holding tank that allows settling.

**Detention time:** How long wastewater remains in a treatment process.

**Dewatering:** The removal of water from sludge.

**Digestion:** The breaking down of sludge and other waste biologically by microorganisms.

**Disinfection:** Use of chemicals or ultraviolet light to kill or deactivate disease-causing organisms.

**Effluent:** The final output of a wastewater treatment facility.

**Floc:** Particulate or bacterial clusters containing aerobic or anaerobic microorganisms that form clusters in wastewater.

**Flocculation:** The process whereby a chemical or other substance is added to wastewater to trap or attract the particulate suspended solids into clusters.

**Force main:** The pipeline that is used to convey wastewater from a lift station at a lower elevation to a higher elevation, particularly where the elevation of the source is not sufficient for gravity flow to reach the wastewater treatment plant.

**Grit chamber:** A chamber in which primary influent is slowed down so heavy inorganic solids can drop out.

**Headworks:** The beginning of the facility where wastewater begins treatment.

**Infiltration:** The movement of ground water into sewer pipes through breaks or cracks.

**Influent:** Untreated wastewater coming into a wastewater treatment facility.

**Interceptor:** Sewer mains that convey wastewater to the wastewater treatment facility. These are usually the largest diameter lines in the sewer system.

**Lift stations:** Utilized in gravity sewer systems to lift (pump) wastewater to a higher elevation so the wastewater flow can reach the wastewater plant.

**Primary wastewater treatment:** The second step in the treatment process; the removal of large inorganic solids and settling out of sand and grit.

**Sludge:** The solid waste material that settles out or is removed from the wastewater treatment process, sometimes called biosolids.

**Tertiary wastewater treatment:** Biological or chemical polishing of wastewater to remove contaminants that are remaining from previous primary or secondary treatment.