South Platte Renew Virtual Tour Video
Water and Resource Renewal from Wastewater

	COPY/VOICEOVER
	Introduction
1	For over 40 years, South Platte Renew has been recovering vital water resources.
2	Our facility serves over 300,000 residents in Littleton, Englewood, and 19 other communities, making us the third largest wastewater treatment plant in the state of Colorado.
3	I'm Rachel, and I'm here to give you a behind-the-scenes look at the South Platte Renew facility and how we renew water for Colorado's future.
4	To get started — What is wastewater and where does it come from?
5	Wastewater is any water that has been used by humans, such as the water that goes down the drain when you wash your hands, take a shower, flush the toilet, or do the dishes.
6	Wastewater from homes, schools, and businesses flow to South Platte Renew for treatment. We do not treat stormwater at our facility.
7	We clean over 20 million gallons of wastewater a day — that's enough water to fill more than 334,000 bathtubs each day!
8	Wastewater is 99.9% water and 0.1% waste. This amount of waste is recovered from the water and converted to renewable materials like biosolids and natural gas.
	Career Overview
9	Water recovery wouldn't be possible without our team here at South Platte Renew. Our mission is providing high-quality treatment for high-quality water. Rethinking wastewater through innovative solutions. Engaging our community to build stronger partnerships.
10	Everything we do is made possible by Operators…
11	…and Mechanics…

12	…to keep our process flowing.
13	Engineers drive innovation and improvements as regulations and treatment needs change and evolve.
14	Lab Chemists monitor the facility's processes and help maintain quality treatment…
15	The Pretreatment team works with different industries – such as restaurants, gas stations, car washes, and metal shops – to ensure they discharge only what the plant can handle.
16	Beneficial Use Operators transport and apply our Biosolids to fields growing corn and wheat.
17	Administration coordinates finances, contracts, communications, and provides education to all ages within the communities that we serve. Their work behind-the-scenes contributes to our overall environmental efforts.
18	Next, we'll take a look at how our team works together to remove waste, pathogens, and nutrients that would otherwise have negative effects on the community and surrounding watershed.
	I. Headworks
19	Flows coming into the plant first enter the Headworks building. There we separate rocks, rags, and other debris—from the flow.
20	It's important to note that anything other than toilet paper does not break down and can cause damage to our treatment system as well as damage to the plumbing in your home It is important to only flush the "Three P's": pee, poop, and toilet paper.
21	At Headworks, screens remove large, solid material. Small grit and gravel falls out of the water flow. These wastes, that can't be broken down during the rest of the process, are deposited into a dump truck which hauls them to a landfill.
22	The water then continues through the plant for further treatment.
	II. Primary Clarification
23	Next, in the Primary Clarification step of the process, the water is slowed down allowing gravity to separate out wastes based on density.
24	The six, large primary clarifier tanks allow heavier solids to sink to the bottom while lighter materials like grease and oil float to the top.
25	A submerged, rotating rake collects the thick, viscous layer at the bottom of the tank. Another arm skims the grease layer at the top to a pump that moves the

	wastes to the dissolved air floatation thickening tanks (DAFT). We'll learn more about DAFT later on.
	III. Trickling Filters
26	After treatment in the clarifiers, water is then pumped to the Trickling Filters.
27	The Trickling Filters are where the first biologic step in the water treatment process takes place. Inside the three Trickling Filters are layers of plastic media that are home to hard-working microorganisms—tiny living creatures that are not visible to the human eye.
28	These microorganisms biodegrade organic material by breaking down carbon. What is waste to us is a desirable food source to them.
29	An arm sprays flow evenly across the hungry "bugs."
	IV. Solids Contact Tanks
30	From the Trickling Filters, the water moves into the Solids Contact Tanks—another biologic stage in the water treatment process.
31	Fine air bubbles are pumped into the Solids Contact Tanks, also known as Aeration Basins, so the incoming liquid, oxygen, and microorganisms are mixed and in contact with each other. Oxygen is required by the microorganisms to metabolize their food source.
32	Now with a food source and oxygen to breathe, the microorganisms can efficiently biodegrade the organic material, effectively reducing solids and removing nutrients from the flow.
	V. Secondary Clarification
33	The water travels from the Solids Contact Tanks to the Secondary Clarifiers where fine solids are allowed to settle similar to the process in the primary clarifiers.
34	This is the second round of settling for solids and sludge. Once settled, the solids move forward into solids treatment—and the water continues onto the next step of the water treatment process: Nitrifying Trickling Filters.
	VI. Nitrifying Trickling Filters
35	Our three Nitrifying Trickling Filters are home to nitrifiers: microorganisms that convert ammonia—a nutrient that can otherwise have harmful effects on the watershed—into nitrate.

36	After passing through the Nitrifying Trickling Filters, the water has far less ammonia, but is rich in nitrate; another nutrient that can adversely affect the watershed.
	VII. Denitrification
37	The water is sent through the Denitrification Filters. Here, denitrifying microorganisms live in a sand and gravel filter that is deprived of oxygen.
38	The Denitrification Filters complete the nitrogen cycle by turning nitrates into nitrogen gas. This gas is released into the atmosphere which is already 78% nitrogen.
39	At the end of the denitrification process, most of the nutrients have been removed from the water that originally entered the plant.
	VIII. Disinfection
40	Water must be disinfected before it enters the natural waterway. Chlorine is used to kill pathogens in the water, and sodium bisulfite is used to neutralize the chlorine before the water enters the South Platte River.
41	One of the innovations that we are working towards is UV disinfection. This process uses UV light to kill pathogens in the water stream eliminating the use of chlorine bleach and sodium bisulfite. We are always working towards healthier innovative treatment processes.
	IX. Finals Building
42	The water must pass through one final check before entering the South Platte River:
43	Operators and monitoring systems monitor the health of the water before allowing it to become part of the natural waterway.
44	Our operators use a computer monitoring system called Supervisory Control and Data Acquisition (SCADA). This system is used to monitor all stages within the process and remotely control valves and pumps.
45	Once the water has been cleaned and disinfected, it rejoins the South Platte River and once again becomes part of our ecosystem.
	Dissolved Air Flotation Thickening Tanks
46	So…what happens to all of the solid waste that is removed from the liquid flow?
47	Remember the Dissolved Air Flotation Thickening Tanks (DAFT) we touched on earlier in the video?

48	Materials that are removed from the water flow at Primary and Secondary Clarifiers are sent to Dissolved Air Flotation Thickening Tanks, where they are thickened and readied for digestion.
	Digesters
49	Solids are pumped into anaerobic (without air) digesters. Here, a natural decomposition in the absence of oxygen takes place in the digesters.
50	Solids are broken down by microorganisms that like the temperature around 98 degrees F. This is about the same as your body temperature and the process is similar to the digestion process that takes place in your stomach. Although it only takes you several hours to do this, the plant takes around 25 days to complete the digestion process.
	Biogas
51	The biogas skid is where we harvest the methane gas produced by microorganisms inside the anaerobic digesters. The gas is first cleaned by removing carbon dioxide, water, and other impurities It is then injected into an Xcel Energy natural gas pipeline. Xcel then supplies customers with gas created from our wastewater!
52	South Platte Renew was the first plant in Colorado to convert biogas into renewable natural gas that is sent directly into the Xcel gas network. This process reduces air pollution and recovers a valuable resource that was previously thought of as waste.
	Dewatering
53	Digested solids are spun in centrifuges, similar to the spin cycle on your washing machine or a salad spinner, to remove excess water and create Biosolids. The finished product is about 18% solids or the consistency of moist soil.
54	Our solids are used on farms to grow winter wheat and summer corn by spreading this rich organic soil amendment to add nutrients and moisture to farms.
	Conclusion
55	At South Platte Renew, vital resources are recovered, Biosolids are transported to farms to grow crops, and Biogas is produced that heats homes and businesses—ultimately, water is renewed and released into the South Platte River for use by those downstream.
56	It is important to remember that we are all a part of this important process to keep our environment safe and healthy.

57	This work couldn't be done without all the employees here at South Platte Renew – operators, mechanics, engineers, lab analysts, pre-treatment specialists, and administration.
58	As regulations change from the Environmental Protection Agency and the Colorado Department of Public health and Environment, so must our processes. This requires additional treatment process and new facility improvements to ensure that the water we discharge meets regulations. We continually work with universities, vendors and other industry professionals to keep us leading the way in environmental stewardship.
59	VO: If you are interested in learning more about the wastewater treatment process or careers in water renewal, visit [vanity URL].