ORANGE WATER AND SEWER AUTHORITY
400 Jones Ferry Road, Carrboro, NC 27510

ANNUAL WASTEWATER REPORT CARD

JULY 2019 TO JUNE 2020

OWASA is Carrboro-Chapel Hill's not-for-profit public service agency delivering high quality water, wastewater, and reclaimed water services.

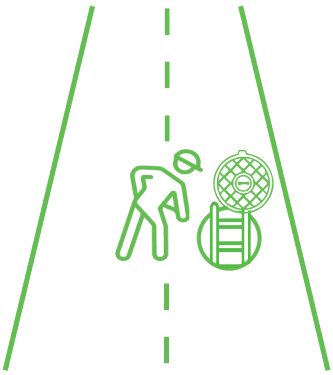
WHEN YOU FLUSH THE TOILET
OR SEND WATER DOWN THE DRAIN, WHERE DOES IT ALL GO?

OWASA's wastewater system treats on average 7.5 million gallons per day; that's about 3 billion gallons per year. We work 24/7 to collect, treat and clean the community's wastewater, and recycle (or reclaim) it where we can. What we can't reclaim, we return to Morgan Creek. The water that we return to the Creek, which eventually flows into Jordan Lake, has gone through a comprehensive treatment process so it is safe for the environment and for communities to access downstream.

350 MILES OF WASTEWATER PIPES UNDER CARRBORO-CHAPEL HILL:
INVISIBLE YET ESSENTIAL

Back in the old days, when people collected their water with pails and tossed their waste out the door, life was messy! With the advent of modern plumbing, chores and sanitation became more convenient and public health improved significantly.

Today, OWASA maintains about 350 miles of underground wastewater pipes, connecting to every home, school and business across Carrboro and Chapel Hill. If you look down when you walk along the street, what do you see? Not a wastewater pipe, but probably a manhole. For maintenance or emergency, OWASA can access this critical piping network anywhere in the community through its nearly 11,000 manholes.



The wastewater system is also designed to harness the power of gravity. Most pipes originate at elevated locations and descend as they make their way to OWASA's Wastewater Treatment Plant in Chapel Hill.

When you send water down the sink at home, or flush the toilet at work, the waste travels through these pipes powered by the natural force of gravity. At locations where gravity has run its course, 21 pump stations help keep the wastewater flowing as it makes its way to the treatment plant.

BIOLOGY PLUS TECHNOLOGY:
THE WASTEWATER TREATMENT PROCESS

Wastewater treatment is the biological process of removing pollutants from the water so it can be returned safely to the environment. OWASA's treatment system mimics nature's processes and uses technology to accelerate it. The system starts with the collection of wastewater through pipes, pumps to help move it, settling tanks to take out solids, and treatment tanks where naturally occurring bacteria and other microorganisms consume pollutants.

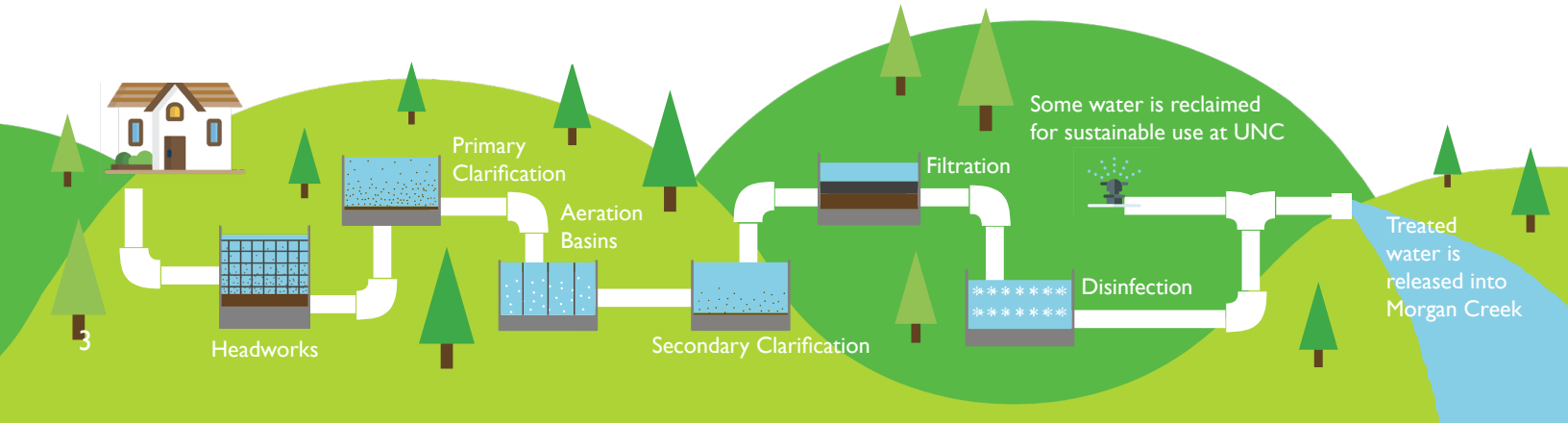
Our Mason Farm Wastewater Treatment Plant is located in the southern part of Chapel Hill. We do our best to be a good neighbor and maintain a comprehensive odor elimination program throughout our treatment process. This includes ensuring our storage basins are covered tight at all times, and treating air being exhausted from our tanks with carbon filters.

While wastewater management is a public service that is somewhat invisible, OWASA's team members that make it happen are so essential! Our wastewater team ranges from operators who manage the treatment processes to our maintenance crews who work every day across the community, maintaining the pumping systems and pipes 24/7. They keep the 350 miles of wastewater pipes coursing underground clear of blockages and test for cracks in pipes to mitigate potential sewer overflows.

Meanwhile, scientists in OWASA's wastewater lab test our effluent – the treated wastewater that we recycle into clean water for return to Morgan Creek. One of the purposes of these tests is to ensure that the leftover nutrients from the wastewater, such as phosphorus and nitrogen levels that re-enter the creek, are below regulatory limits. This is important because nutrient levels that are too high can cause an increase in algal blooms, which have the potential to affect water quality.

"The water that people use for personal hygiene, cleaning, in commercial buildings and restaurants, it all originates from local water sources and is returned to OWASA as wastewater," said Monica Dodson, OWASA's Wastewater Treatment and Biosolids Recycling Manager. "At our plant, the wastewater undergoes thorough clarification, filtration and disinfection processes. Along the way, we reclaim some of it for sustainable use for non-drinking purposes. This reduces our use of water, energy and material resources, a triple win for the planet."

OWASA'S WASTEWATER TREATMENT PROCESS



REDUCE, REUSE, RECYCLE!

RECLAIMING WATER FOR MORE THAN 10 YEARS

In 2009, OWASA and the University of North Carolina (UNC) at Chapel Hill partnered to develop a reclaimed water system. The system provides UNC with recycled, reclaimed water (instead of treated drinking water) to meet university demands for water that is not for human consumption in a more sustainable way. For example, the University uses reclaimed water to irrigate athletic fields on campus, to flush some toilets, and in chiller plants to cool buildings.

Last year, UNC used an average of 0.68 million gallons of reclaimed water a day. That's nearly one million gallons less raw water each day that OWASA needs to source from University Lake and Cane Creek Reservoir. In fact, since 2009, the 2.5 billion gallons of wastewater that OWASA has reclaimed for use at UNC equates to the size of University Lake about five-times over!

UNC pays OWASA the full cost to operate and maintain the reclaimed water system. This enables OWASA to cost-effectively meet UNC's non-drinking water requirements, while freeing up the community's drinking water supply and treatment capacity to meet other essential needs.

Overall, the use of reclaimed water decreases the energy used in the community's water treatment process and lowers both OWASA's and UNC's greenhouse gas emissions.

EACH DAY A NEW OPPORTUNITY FOR WIL LAWSON AT THE WASTEWATER TREATMENT PLANT

Driving across the bridge to OWASA's Wastewater Treatment Plant on Old Mason Farm Road brings a different responsibility each time for Wil Lawson, the plant's Operations Supervisor.

"You have to set your priorities once you come in the gate," Wil says. "My day consists of dealing with contractors, doing rounds about the facility, checking lab results to make sure we're in compliance with safety regulations."

Wil studied Earth and Environmental Sciences at North Carolina A&T while at the same time earning a waste management certificate. That started the pathway to OWASA, where he has been in this role since the summer of 2018.

Wil says that he is able to align his values with his work in this role at OWASA.

"For one, we're environmentalist, to a certain degree," Wil says. "We do good for the community by cleaning up the dirty water. It's one of those jobs people don't think about…people don't think of how wastewater leaves your house, especially during emergency events.

"Somebody's always here, 24 hours, seven days a week."

RECYCLING NUTRIENTS
WITH BIOSOLIDS

Another by-product of the anaerobic digestion process is an organic material containing nutrients called biosolids. During the anaerobic process, the extreme heat applied in the digester to aid the breakdown of the organics also destroys bacteria and eliminates odors. The nutrients in these biosolids are recycled and reused as fertilizer or amendments to improve soil conditions.

We land apply biosolids to lands that we own or through partnerships with farmers in Orange, Chatham and Alamance Counties, in accordance with State permits and regulations. The maximum amount of biosolids that can be applied to a field is determined by the biosolids' nitrogen content, and is limited to the nitrogen requirements of each particular crop. Our biosolids are designated as Class A – Exceptional Quality by the Environmental Protection Agency (EPA).

OWASA closely monitors its biosolids application rates which are well below regulatory levels. In accordance with Federal regulations, we test our biosolids quality throughout the year. We also measure the trace metals, solids, and nutrients in our biosolids every 60 days. Protecting water quality is our top priority so we monitor groundwater quality three times per year at OWASA-owned locations.

Last year, we recycled about 50% of our biosolids through land application. As reported in the table below, the level of substances in our biosolids met or surpassed all State and Federal regulations. What we don't land apply we compost into a soil additive in partnership with a regional composter.

Biosolids Quality Annual Data Summary (Permit #s WQ0021828/WQ0001169)		
Substance	EPA Limit for Exceptional Quality Biosolids	OWASA Fiscal Year Results
Fecal Coliform Bacteria	1,000 CFU	129 CFU (maximum)
Mercury	17 ppm	0.58 ppm
Cadmium	39 ppm	0.78 ppm
Arsenic	41 ppm	1.75 ppm
Lead	300 ppm	4.64 ppm
Copper	1,500 ppm	259 ppm
Zinc	2,800 ppm	788 ppm
Nickel	420 ppm	11.5 ppm
Molybdenum	n/a	6.00 ppm
Selenium	36 ppm	3.43 ppm

ppm = part per million. One part per million is equal to one penny in $10,000.
CFU = colony forming units

BACK TO MORGAN CREEK
AND BEYOND

Water that is not reclaimed throughout this comprehensive treatment process is returned to Morgan Creek, safe for the environment and communities. This includes wildlife along the waterway's path. Plus water treatment plants and the people they serve downstream. The water eventually makes its way to the Atlantic Ocean, traversing Jordan Lake and Cape Fear River along the journey. It's all part of the world's water system, interconnected, interdependent and shared by everyone, making it all the more important for us to transform our community's wastewater into clean water, before we return it back to the environment.

Last year, as in previous years, OWASA met or surpassed all Federal and State standards for the quality of our treated wastewater. We ensure that leftover nutrients from wastewater, such as nitrogen levels, are below regulatory limits so as not to impact water quality. In our effluent (the treated water we return to Morgan Creek) phosphorus and nitrogen levels test consistently below the regulatory limit.

Wastewater Effluent Quality Annual Data Summary (Permit # NC0025241)			
Water Quality Measure	Regulatory Limit	OWASA Fiscal Year Results	Notes
Phosphorus	Maximum of 10,188 lbs for the year	1,456 lbs	Full compliance; 86% below the limit
Nitrogen	Maximum of 409,448 lbs for the year	94,780 lbs	Full compliance; 77% below the limit

OWASA's Youth Water Academy visits the Wastewater Treatment Plant to learn about the wastewater process.

INVESTMENT IN INFRASTRUCTURE

Maintaining the community's wastewater infrastructure in a major priority for OWASA. Roughly half of every dollar OWASA receives through rates and fees is put back into the system infrastructure.

That investment over the last year has included completely rehabilitating our headworks, which is where all of the wastewater from across our community enters the Wastewater Treatment Plant. These improvements also focused on reducing the rate at which the concrete in the headworks was degrading so that we can have a longer lifespan for that critical piece of the plant.

We are also making the plant more efficient! Work is underway on a project to upgrade other equipment that will result in using less chemicals, water, and energy to treat the community's wastewater. These efforts have another impact as well, reducing odors surrounding the wastewater treatment plant as part of our commitment to being a good neighbor and eliminating off-site odors.

Other projects in the last year have added resiliency and redundancy to make sure the plant is operating as best as it can for the community.

AMERICAN WATER WORKS ASSOCIATION PARTNERSHIP FOR CLEAN WATER

OWASA staff completed a comprehensive self-assessment at the Mason Farm Wastewater Treatment Plant in 2020 as part of our participation in the American Water Works Association Partnership for Clean Water. This process included reviewing each process, procedure, and policy at the Wastewater Treatment Plant with the goal of building a road map for optimized performance.

This was a true team effort, bringing in operators, engineers, mechanics, managers, and directors to find out how we can do what we do even better.

The Partnership is a voluntary program that focuses on optimizing our operations to improve the quality of the water as we return it to the environment well-beyond regulatory requirements and doing so in an energy-efficient manner.

WASTEWATER (SEWER) OVERFLOWS

What flows through a community's wastewater system is what gets flushed or sent down the drain by residents and visitors. Sometimes, what isn't supposed to be flushed can create overflows. For example, when grease gets sent down sinks and builds-up in the system. Or when a large volume of dental floss clogs up a pump. Nature can also play a role; for example, when a tree root causes a crack in an underground pipe, or when a flash flood inundates the system with too much water.

We continuously monitor the community's wastewater system to mitigate for potential overflows. This is important because wastewater can be contaminated, so we work to prevent overflows or isolate them quickly when they occur. Electronic alarms at pump stations throughout our system notify us of a potential issue, which we investigate quickly to keep the wastewater moving. We count on the community to alert us too. If you see an overflow at a manhole, please stay clear of the area (people and pets) and notify OWASA immediately at 919-968-4421.

Last year, the total volume of recorded overflows in OWASA's wastewater system was 2,185 gallons. As noted in the table below, three overflow events occurred due to debris in the wastewater line, tree roots interfering with the line, and one act of vandalism.

Sewer Overflows Annual Data (Permit #WQCS00031)			
Date	Location	Quantity (Gallons)	Cause
9/27/19	221 South Columbia Street	600 gallons	Debris in line
1/6/20	208 Clark Lake Road	945 gallons	Roots
1/8/20	Morehead Labs	640 gallons	Vandalism

YES TO THE THREE Ps!

One impact from the COVID-19 pandemic has been an increase in sanitary wipes being flushed down the toilet. Flushing the wrong stuff can harm the wastewater system by causing costly and messy clogs and even impact water quality in our streams and lakes. This is a friendly reminder that the three Ps are the only things that should be flushed down the toilet: pee, poo, and toilet paper!

PROTECT YOUR COMMUNITY'S WASTEWATER SYSTEM

Together, we can protect our community's water system, wastewater system and the environment. Please help keep these items out of our sewers:

"Flushable wipes" – these clog wastewater pipes and get caught in the equipment at the treatment plant. Please dispose of wipes in the trash, even if the package says they're flushable!

Feminine products – these products expand and absorb moisture, making it difficult for them to travel through pipes. Nor do they break down into smaller pieces.

Disposable diapers – like feminine products, diapers expand and absorb moisture, and are very bulky. Diapers are just not meant to be flushed!

Oils and grease – inside a sewer or plumbing drain, fat, oil and grease harden into a plaster-like substance that can block flow. Please scrape or wipe fat, oil and grease off pots, pans, plates and bowls before washing them.

Dental floss – this stringy substance loves to wrap itself around anything and everything that travels down the same path in the sewers.

Other products that should not be flushed – sand, hair, kitty litter, condoms and cotton balls.

PRESCRIPTION MEDICATIONS!

Please don't flush prescription medications. Wastewater treatment plants were not designed to remove the chemicals in many pharmaceuticals. If they are flushed and enter the wastewater system, they may enter into a creek, river or lake that acts as a water supply for a community downstream, or harm aquatic life. The Police Departments of Chapel Hill and Carrboro have "no questions asked" drop boxes where you can discard of your leftover medicines.

Safe Disposal of Medications Locations	Drop Box Day	Hours	Address	More Information
Chapel Hill Police Headquarters	Monday - Friday	9 am – 5 pm	828 Martin Luther King Jr. Blvd.	919-968-2760
Carrboro Police Department	Monday - Friday	8:30 am – 5 pm	100 N. Greensboro St. (Century Center)	919-918-7397

2019-2020 QUICK FACTS

Our team mowed and cleared 107 miles of easements in the community to help keep tree and shrub roots from growing into the wastewater system.

Last year, OWASA cleaned about 120 miles of wastewater pipes, 36% of the community's wastewater system. Fats, oil and grease, dental floss and wipes were the main culprits clogging up the system.

We tested for cracks by putting non-toxic smoke into the wastewater pipes to see where the smoke came out. Cracks are caused mostly by intrusive tree roots, and also age. Where we found a crack, we fixed it: to keep rainwater and groundwater from seeping in, and wastewater from leaking out.

Throughout the year, we spent $7.4 million replacing or renewing 3.8 miles of wastewater pipes to prevent overflows and maintain system resiliency.

FOR MORE INFORMATION ABOUT WASTEWATER AND RECLAIMED WATER

If you have any questions about the wastewater treatment process, please contact our team! Connect with Monica Dodson, OWASA's Wastewater Treatment and Biosolids Recycling Manager, at 919-537-4205.

LEARN MORE

PLAN A FUTURE TOUR OF THE WASTEWATER TREATMENT PLANT!

The science of wastewater treatment is fascinating incorporating biology, ecology, chemistry, and more! Unfortunately, tours of the treatment plants are temporarily suspended due to COVID-19. Please stay tuned to owasa.org for more information on when tours will resume and other fun ways to engage.

CHECK OUT OUR VIDEO

You can also view OWASA's educational video to learn more, for example, about the ultraviolet lightshow that helps disinfect bacteria. Peaked your interest? View our video now! https://bit.ly/2ZJJtUK

CONTACT OWASA ANYTIME

OWASA is Carrboro- Chapel Hill's not-for-profit public service agency delivering high quality water, wastewater, and reclaimed water services. Under the streets, in the field, at the lab and in the office, our diverse team manages the community's wastewater system. Contact us anytime. We welcome your questions and feedback!

ORANGE WATER AND SEWER AUTHORITY
400 Jones Ferry Road, Carrboro, NC, 27510
919-968-4421
info@owasa.org
owasa.org
@OWASA1