WMPSE

WASTE MANAGEMENT PROS OF THE SOUTHEAST

We are committed to upgrading and maintaining wastewater systems to ensure the reliability and efficiency of neighborhood infrastructure.

What makes WMPSE the best choice for alternative public water & sewer utilities across the Southeast

Permitting and Engineering, at WMPSE, our team of engineers perform permitting and design for water and wastewater treatment facilities in-house.

Eric Swain, owner, licensed NC wasterwater contractor and board certified inspector with 38+ years of experience in full service civil contracting for water and sewer utilities, with a background of 30+ years of experience in heavy highway construction with NCDOT and SCDOT.

Melinda Green, lead engineer, a previous supervisor for regulating water and wastewater across the Southeast, also worked at NCDEQ as a regulator and an expert NPDES permit writer.

Patrick Bradley, currently an engineer with Michael Baker International, previously a regulating supervisor with the USEPA, also served as Utility Director for the City of Richmond, VA and is still considered one of the top qualified expert permit writers for NPDES.

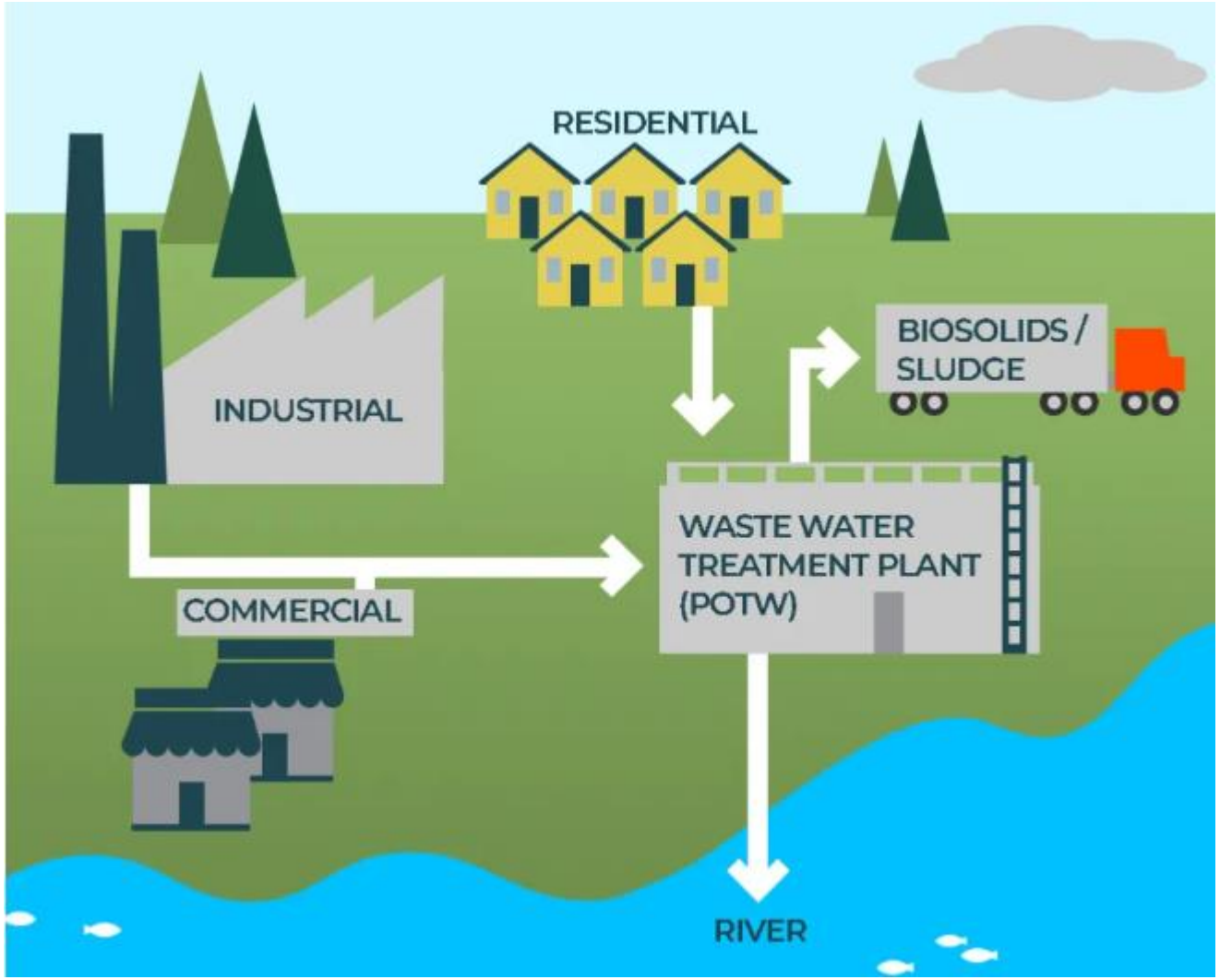
This Trio brings expert permit writing, decades of wastewater experience and a focus on continuing future capacity needs with necessary resources.

A Guide to Our Wastewater Treatment Services

As a leader in environmental conservation, we are dedicated to providing innovative and effective methods for transforming wastewater into clean, reusable water resources.

Explore our range of treatment options, each tailored to meet the unique needs of communities, businesses, and industries across our service areas in Florida, North Carolina, South Carolina, Virginia, and Georgia.

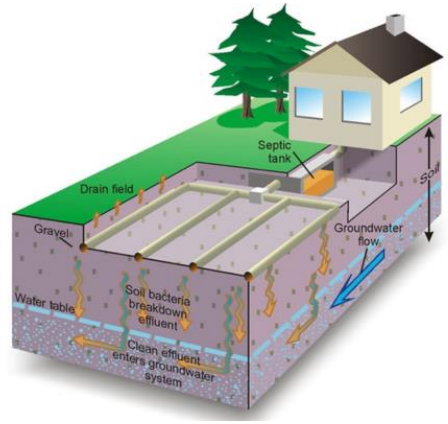
From conventional activated sludge systems to advanced membrane bioreactors, we're committed to delivering sustainable solutions that safeguard water quality and protect our precious natural resources.

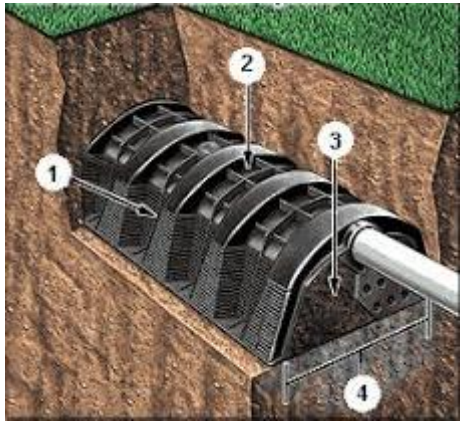


Common Septic Systems for Residential & Small Businesses

Conventional Septic System

A conventional septic system comprises a septic tank and a drainfield, typically installed at single-family homes or small businesses. Effluent from the tank is directed to a trench or bed filled with gravel or stone, where it filters through and undergoes further treatment by soil microbes. While effective, these systems require a significant footprint and may not be suitable for all residential sites or conditions.





Chamber System

A chamber system offers an alternative to traditional gravel/stone systems. A series of interconnected chambers, this system is particularly helpful in areas with high groundwater tables or scarce gravel resources. Wastewater is directed from the septic tank to the chambers via pipes, where it undergoes treatment by soil microbes, promoting efficient and environmentally friendly disposal. Because of ease of construction, this system is a sustainable solution for various residential and commercial settings.

Common Wastewater Treatment Solutions

Conventional Activated Sludge

Utilizing a time-tested process, conventional activated sludge treatment plants harness the power of microorganisms to break down organic matter in wastewater. Through aeration and settling, the activated sludge method effectively removes pollutants, producing cleaner water suitable for discharge or reuse.

Biological Nutrient Removal AS

Biological Nutrient Removal (BNR) activated sludge plants go beyond simply treating wastewater, they actively target and remove nutrients like nitrogen and phosphorus. By employing specialized microbial communities, BNR systems, enhance water quality, mitigating the environmental impact of nutrient-rich effluents on receiving bodies of water.

Sequencing Batch Reactors

Offering versatility and efficiency, sequencing batch reactors (SBRs) provide a flexable approach to wastewater treatment. These systems operate through a series of times cycles, allowing for biological treatment, settling and decanting in a single reactor vessel. SBR technology is ideal for applications requiring compact design and precise control over treatment processes.

IFAS Integrated Fixed Film Activated Sludge

IFAS treatment plants combine suspended growth and attached growth processes to achieve enhanced treatment performance. By incorporating fixed media within the activated sludge system, IFAS configurations increase biomass retention and surface area for microbial growth, resulting in improved nutrient removal and over all treatment efficiency.

MBBR (Moving Bed Biofilm Reactor)

MBBR systems employ a biofilm-based approach to wastewater treatment, where plastic media carriers provide a substrate for microbial attachment and growth. This allows for high levels of biological activity within a compact reactor footprint, leading to efficient removal of organic matter, nutrients and contaminants from wastewater.

Step 1: Wastewater's Journey Begins

Whenever water is used in your home or business—whether from washing dishes, taking a shower, or running appliances—it becomes wastewater and enters the municipal sewer system. This network of underground pipes carries the wastewater away from buildings, often merging with sewage from other homes, businesses, and industrial facilities. Gravity typically guides this flow, but in some areas, pump stations assist in moving the wastewater to the treatment plant. This marks the first stage of the water's journey, taking it from your property to where it can be treated and eventually returned to the environment.

Step 2: Initial Treatment: Solids Separation and Primary Treatment

Upon arriving at the wastewater treatment plant, the wastewater undergoes primary treatment. This phase focuses on removing larger solids and debris, which could otherwise cause issues in the later stages of treatment.

- **Screening**: Large objects like sticks, rags, and trash are screened out.

- **Sedimentation**: The water then enters sedimentation tanks where heavier solids (known as sludge) settle at the bottom, while lighter materials, such as oils and grease, float to the surface and are skimmed off.

- **Grit Removal**: In some cases, grit removal systems are used to eliminate sand, gravel, and other heavy particles that could damage equipment.

Once these solids are removed, the remaining liquid—now free of most physical contaminants but still containing dissolved and suspended organic materials—is ready for secondary treatment, which might include a journey through constructed wetlands.

Step 3: Two Pathways: Tailored to Your Needs

After the wetlands have done their work, the water has two possible paths:

•Path 1: Further Filtration

In locations equipped with advanced filtration facilities, the water exiting the wetland can undergo further purification. This is especially important in areas where the water will be reused for drinking or other sensitive applications. The water is pumped from the wetlands into a filtration plant, where technologies like sand filters, activated carbon filters, or membrane filtration remove any remaining contaminants. This extra step ensures that the water meets stringent quality standards before it's reintroduced into the municipal water supply.

•Path 2: Direct to Water Treatment Plant

If the region doesn't have a specialized filtration facility, the water is sent directly from the wetlands to a traditional water treatment plant. Here, the water undergoes final polishing, which may include disinfection (using chlorine, ozone, or UV light) to kill any remaining pathogens. The goal is to make the water safe for reuse or discharge into local waterways without causing environmental harm.

Step 4: Back to the Pipes: Ready for Reuse

After the final treatment, the now clean and safe water is pumped back into the municipal water system. Depending on the local needs and infrastructure, this water may be used for various purposes:

- **Drinking Water**: After additional purification and quality checks, the water can be reintroduced into the drinking water supply.
- **Irrigation**: Treated water may be used for agricultural or landscape irrigation, reducing the demand on freshwater resources.
- **Industrial Use**: Industries often use treated water for processes such as cooling or cleaning, further conserving potable water sources.

This water has undergone a thorough, environmentally responsible journey—from your toilet, through treatment plants and wetlands, and back into your community's water system—ensuring that every drop is utilized sustainably.

WASTEWATER INTO CLEAN WATER: OUR INNOVATIVE SOLUTIONS

PHASE ONE

Investigate the project and start best options for project utilities.

There are several deciding factors here to suggest a type of utility available for this project.

The most common types of sewer utilities are Land Application and must be considered first before a direct discharge sewer system.

Phase one is also where we will investigate the closest municipal sewer available.

Into the Wetlands: Nature Takes the Lead (process currently used in South Carolina)

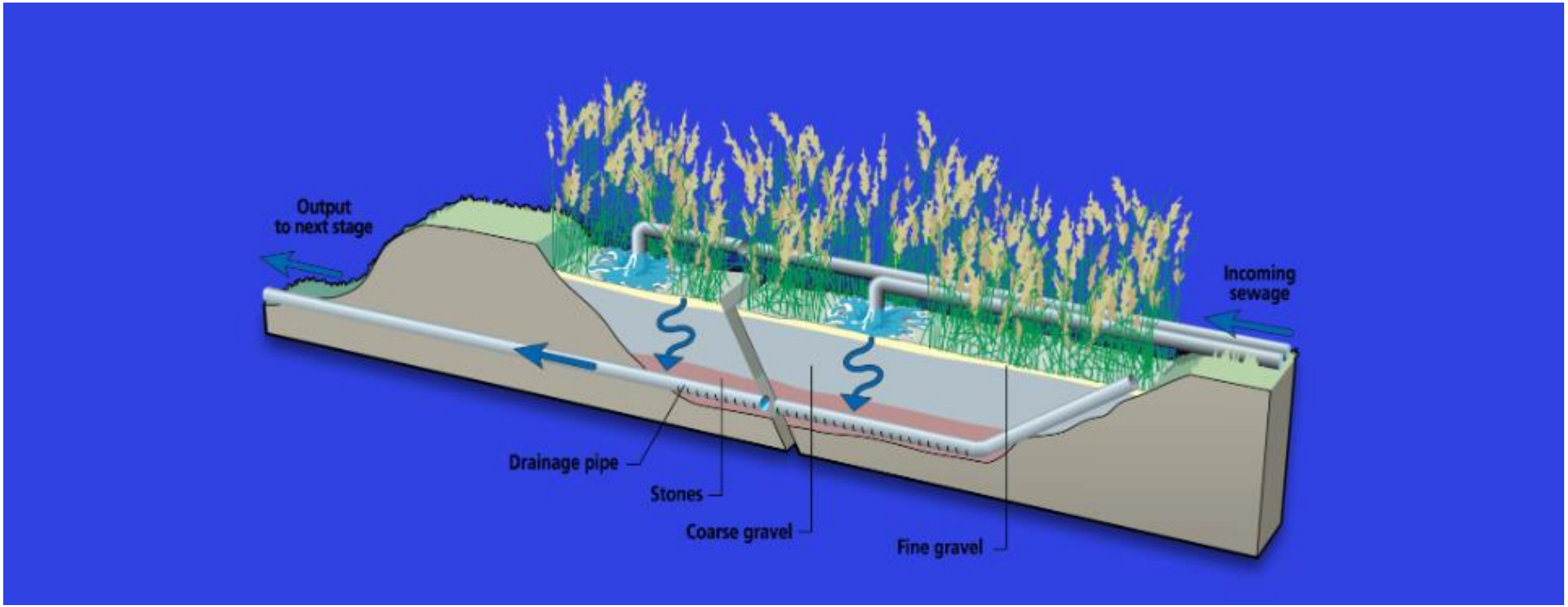
The partially treated effluent is now directed into a constructed wetland, a specially designed environment that mimics the filtration capabilities of natural wetlands. Here's where nature really shines:

- **Filtration**: As the water flows slowly through the wetland, it passes through vegetation and a substrate made up of soil, gravel, or sand. This process filters out smaller particles and some pollutants.

- **Nutrient Absorption**: Plants in the wetland, such as reeds and cattails, absorb excess nutrients like nitrogen and phosphorus, which in high concentrations could harm natural water bodies.

- **Biodegradation**: Microorganisms living in the soil and around the plant roots break down organic matter and pollutants into less harmful substances. This biological activity is crucial for reducing contaminants and improving water quality.

- **Oxygenation**: Some plants also help to oxygenate the water, creating an environment where aerobic bacteria can thrive and continue the treatment process.



Why choose Constructed Wetlands?

Constructed wetlands are not just a sustainable solution—they are a testament to the power of nature when combined with innovative engineering. By choosing WMPSE, you're opting for a method that reduces energy consumption, minimizes chemical use, and supports the local ecosystem. Plus, our unique position as the only provider of this process on the East Coast means you're getting a cutting-edge service that's as rare as it is effective.

Land Application Permits vs. NPDES Permits

Non-conventional sewer types, such as drip or spray irrigations, along with Level IV septic systems are **all now considered to be forms of Public Sewer Systems per SB166,** and these types of systems can be designed by licensed wastewater engineers, as well as the local county Environmental Health Department, however, depending on the size of the system and the soil reports, a permit may be required from NCDEQ.

VS.

Independent sewer plants (package plants) initially designed to eliminate discharges, however, the highly treated sewer plants used today are much more **economical** than land application.

The highly treated affluent from todays sewer plants is much **cleaner**.

This system has the potential to create **increased capacity** to benefit all users and providers.

Ownership & Maintenance (O&M)

- Public-Private Partnership
- Utility commission requires succession plan
- State mandate requires a public utility ownership/operation for 15+ customers.
- Licensed NC Wastewater Contractor and Board Certified Inspector
- Bonded
- Insured

Legislation & Regulations

- PPP (Public-Private Partnership)
- COG (Council of Government)
- DEQ (Department Environmental Quality)
- Per NCDEQ, no permits are being issued to private ownership, HOAs, or developers.

Operational Standards

- NCDEQ Mandated Inventory for Emergency Backup Plan (generators)
- Preferred Partnerships with suppliers
- COG – NC Council of Government
- 208 rule
- Maintenance Compliance Regulations
- Municipality Ownership

Summary

An overview of wastewater systems which include conventional, non-conventional and independent, regulations, and increasing capacity concerns throughout North Carolina.

Initiatives:

- Future Expansion Programs
- Municipality Ownership
- Scholarship Opportunities for Students
- Workforce Development