Project Highlight: The City of Plant City Water Reclamation Facility

Location: Plant City, Florida
Segment: Water Management – Wastewater Treatment
Project Type: Oxidation Ditch Mixer Replacement & Installation
Project Completion Date: Q2.2026

Project Overview

With a capacity of 10 MGD (million gallons per day), and a peak flow factor of 27 MGD, the City of Plant City WRF (Water Reclamation Facility) manages wastewater treatment for both local residential and nearby commercial customers. The facility uses a "racetrack-shaped" oxidation ditch, originally designed by Malcolm-Pernie Environmental Engineering Firm (now ARCADIS), based in White Plains, NY, for their activated sludge biological treatment process. The oxidation ditch is a key component of the overall biological treatment process, where consistent mixing is essential to keep solids in suspension and ensure effective interaction between wastewater and the microorganisms responsible for consuming harmful bacteria.

Wilo USA
W66N1253 Forward Way
Cedarburg, WI 53012

T: 262-204-6600
wilousa.com

For years, the facility depended on legacy competitor submersible mixers. Although the units were routinely maintained, design limitations in mechanical sealing systems, used specifically for motor protection functions, and serviceability, continued to create reliability challenges for the Operations & Maintenance Teams.

As maintenance demands increased, the Operations Team shifted their focus beyond the standard repair, and replacement approach and sought mixing equipment engineered for higher efficiency, continuous-duty reliability, and reduced maintenance.

Following the successful installation and long-term operation of a Wilo-TR 226 low-speed submersible mixer, the O&M Team proposed the standardization of all mixers to Wilo as part of a phased upgrade strategy.

"*We originally installed one Wilo mixer as a replacement,*" explained Tony Bauer, Electrical Mechanical Superintendent for the City of Plant City. "*It lasted longer than any of the others we had running, and that gave us the confidence to continue replacing the rest*."

The Challenge

Plant City's original mixers were rebuilt multiple times due to recurring mechanical seal failures, in most cases, resulting in catastrophic motor damage.

In traditional mixer designs, mechanical seal failure often results in water intrusion directly into the motor chamber. These failures frequently lead to extensive motor damage, increased repair costs, and unplanned equipment downtime, often resulting in major disruptions within the wastewater treatment process.

"*The seal failures were a big issue,"* Bauer said. "*Once the seal failed, it could lead to the motor burning up."*

Accessibility to the original equipment also posed a challenge. The legacy mixers required dismantling of the blades to remove them from the elevated walkway(s). To further complicate the removal process, the legacy equipment was configured with keyed shafts, which require a high-level of technical expertise to disassemble and reassemble, whereas the Wilo mixer blades utilize a simplified bolt-on design making it easier and quicker disassemble and transport.

Furthermore, the process requirements within the oxidation ditch left no margin for inconsistent mixing.

"*The mixers play a key role in our processes, providing the mixing that ensures everything entering the basin is properly mixed with the [healthy] bacteria we're growing in the system*," said Patrick Murphy, Plant City Wastewater Operations. "*That circulation is essential for maintaining the biological treatment process*."

The City of Plant City needed a mixer solution that provided both reliability and long-term operating efficiency without compromising process performance.

The Solution

To overcome these challenges, the City of Plant City specified Wilo-TR 226 low-speed submersible mixers, engineered specifically for wastewater treatment applications, as the basin of design for their 2025 Design-Build equipment upgrade initiative.

Rather than relying solely on motor horsepower and high rotational speeds to generate thrust, Wilo TR low-speed mixers are designed around efficiency. Innovative blade geometry, paired with proprietary planetary gear drive technology, allows Wilo mixers to deliver the required thrust output at lower rotational speeds, thereby reducing equipment mechanical stress while maintaining effective media circulation.

Another key differentiator was Wilo's multi-chamber sealing system, which provides additional layers of protection between the mixed liquids and the mixer motor. This unique internal design significantly reduces the risk of motor damage in the event of a seal issue, intently addressing one of the Plant's most persistent maintenance problems.

"*The reliability and the warranty were big drivers for us*," Bauer said. "*The internal design with multiple chambers for the seal system gives us more protection compared to what we had before*."

The Wilo TR 226 mixers were configured to integrate seamlessly into the original design. By fitting the existing guide rail system, the city was able to avoid major modifications to the mast systems during installation.

Once the oxidation ditch(es) was drained, the contracting construction crews installed nearly 18 Wilo mixers over a three day period. "*Other than some wiring changes in the control cabinets, it was pretty much plug-and-play*," Bauer explained.

Wilo and channel partner support teams were on site during startup and commissioning to verify performance and ensure proper operation.

Results & Customer Benefits

Since commissioning, the Wilo-TR-226 units have delivered consistent mixing in the oxidation ditches while operating smoothly and quietly.

After a successful start-up and commissioning, plant operators immediately noticed reduced vibration and noise compared to the previous mixers, which is a clear indicator of improved mechanical balance and lower operating stress.

"*They've been running very well so far,*" Bauer said. "*They're also noticeably quieter. With the previous mixers you could hear them through the guide rails, but these run very smoothly*."

While the mixers are still early in their service life, Plant City expects long-term reductions in maintenance costs due to the robust sealing system, increased efficiency, and simplified mechanical design.

Key benefits include:

- Multi-chamber sealing system, which provides superior motor protection compared to conventional single seal designs.
- Large-diameter innovative blade geometry, low-speed propeller design delivers required mixing without relying on excessive RPM.
- Bolted blade design allows for easier removal and servicing without complex shaft & propeller disassembly.
- Reduced vibration and noise indicate lower mechanical stress and improved long-term durability.
- Consistent mixing supports biological treatment performance in the oxidation ditch.

Why Wilo?

Plant City's decision to standardize on Wilo mixers was driven by the performance of the initially installed mixer and confidence in the engineering behind the product.

"*The first one we installed performed very well and outlasted the others," Bauer said. "That's what ultimately led us to continue replacing the rest with Wilo*."

The team also noted the mixer design, reliability, and warranty coverage as clear differentiators compared to other available options.

"*If I had to sum it up, I'd say they're highly reliable, have one of the best warranties, and the design is top-notch compared to other mixers in the market*."

Project Partners

Channel Partner: Carter & Ver Planck
Contractor: Vogel Bros.
Client / End User: City of Plant City Utilities Department
Wilo Team: Harold Adams, National Sales Manager / Bill Tanner, Service Technician Specialist / Raymond Albritton, Application Engineer Specialist

Key Products

Wilo-TR 226-3.43-4 Slow speed submersible mixer – Qty 18

Mixer Accessories (lifting devices)

Summary

The City of Plant City oxidation ditch mixer replacement project highlights the value of engineering-driven mixer design in municipal wastewater treatment operations.

By moving away from legacy mixer technology and standardizing on Wilo low-speed submersible mixers, the city addressed long-standing reliability and maintenance challenges.

With future system expansions underway and additional treatment capacity coming online, Plant City now has a mixing solution designed not just to operate, but to perform efficiently and reliably for years to come.

Wilo USA
W66N1253 Forward Way
Cedarburg, WI 53012
T: 262-204-6600
wilousa.com