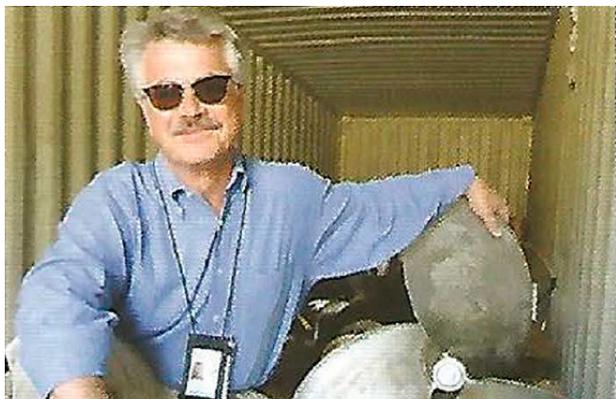


Impeller blade upgrade

Dec 2017



The US-based Triangle wastewater treatment plant is replacing mixers with fibreglass impellers with Landia mixers that have solid stainless steel impellers.

At the Triangle Wastewater Treatment plant in Durham County, North Carolina, fibreglass-bladed mixers have gradually been replaced with stainless steel versions. In addition to 70% of its intake being industrial wastewater, Triangle WWTP also has to handle the large fluctuations in flow from the huge 50,000 weekday workforce influx at nearby Research Triangle Park, to just 6,000 local residents on weekends, when flows are appreciably slower.

Joseph R. Pearce, deputy director for Durham County's Engineering and Environmental Services Department, said: "Although our percentage intake of industrial wastewater is significantly higher than the national average, we still have to deal with all the hair and rags that despite pre-screening can cause clogging problems for any treatment plant".

Pearce says that during almost 10 years at Triangle WWTP, he and his team have laboured long and hard to keep the fibreglass-bladed mixers going: "We've been doing everything that we can, but the clogging, especially during a storm event became more and more frequent, having to pull the mixers up from which heavy hair mixed with plastics and cotton swabs were hanging, taking them out of service. It became normal for this to be once per month, per mixer, in some of the treatment facility mixing zones. Eventually, the fibreglass blade's gel coat front edge wears off, making them split - and at up to almost \$20,000 per blade to replace, this was something we had to address."

Originally built in the early 1960s and expanded in the 1970s, Triangle Wastewater Treatment Plant was upgraded in 2005, when mixers with fibreglass impellers were installed.

In 2013, a new sludge handling facility was constructed. This time around, the decision was made to use mixers from Landia that have solid stainless steel impellers.

The Sludge Handling (Biosolids) Facility consists of two aerated sludge holding tanks with a capacity to hold 1,000,000 gallons, three centrifuges, and an automated truck loading station. Excess biomass flows to sludge holding tanks. The waste sludge thickens by gravity and the supernate is decanted into a side stream equalisation tank.

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With stainless steel impeller, clogging problems and blade wear are not an issue. Triangle's proactive recycling was in evidence when Joe Pearce recently snapped up some 12-year-old Landia mixers from another treatment plant in North Carolina. "Even though these mixers are over a decade old," he said, "the blades are in excellent condition. I'll gladly have these superior quality and longer lasting stainless steel units on board as back up, rather than fibreglass, which I know will break.



Landia mixers and jet aerators were installed to mix and aerate the thickened sludge (1% dry solids), to ensure a uniformed sludge solids concentration and to minimise anaerobic conditions.

Polymer is added to the thickened sludge before it is moved to the centrifuge, where a cake sludge (20% dry solids) is produced and pumped to trailers before transport to a nearby commercial Class A composting facility for stabilisation and distribution to the commercial landscape market.

"In our sludge facility, we have no issues whatsoever with the Landia mixers," said Pearce. "They were very reliable, so we then retrofitted a Landia mixer into one of our problem basins to try it. After a seven-month run we had no clogging whatsoever, so one by one as the

fibreglass-bladed mixers inevitably split, we've been replacing them with the stainless steel propeller mixers from Landia, because we fully expect fewer clogging problems and blade wear not to be an issue."

Triangle WWTP now has a total of 15 Landia mixers, with that figure set to almost double as the gradual switch to much longer lasting stainless steel units takes its course. In addition to anoxic and anaerobic zones, the mixers will also be installed in 18-foot deep oxidation ditches requiring propellers approximately 5ft in diameter, which work at just 47rpm.

"Not surprisingly," continued Pearce, "we've made a big saving on our maintenance program and I'm also pleased for our team that there is now much less use of winches and crane hoists and exposure to rags because we don't really have to do much to the Landia mixers. We're extremely happy with our investment in a much higher quality product because improving Durham County's facilities and improving safety is very much our mission."



Landia Mixer POP-I with stainless steel propeller blades.

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