

Bar screen effectively prevents pumps from clogging

Problem

New Jersey's Lower Township Municipal Utilities Authority operates a 5 mgd wastewater treatment plant. Influent arrives through a 48-inch pipe 23 feet below grade. The manual inflow pump screening setup was difficult and hazardous to clean, and the 2.5-inch screen spacing let too much non-dispersible waste through. The 3,000 gpm non-clog pumps clogged constantly, and each day two or three workers had to descend a 26-foot stairwell into a dark, hazardous environment to remove debris from the screen. Matthew Ecker, executive director, calculated the labor cost alone at over \$26,000 a year.

Solution

Aqualitec fabricated its **Screentec bar screen** on a customized bracket, secured to the wall by guiderails and attached at its upper base by a single pair of brackets. The screen has no moving parts. To allow easy removal, it was installed with no attachments at the bottom of the lift station structure. "We installed the Screentec unit with our own forces in two days with a four-man crew and an electrician," Ecker says. "We used a pickup truck crane and hand tools. Other than removing a small handrail section, installation required no modifications to the inflow structure."



RESULT

The design has exceeded expectations. "Our new vertically installed screen with a 3/4-inch bar spacing does the job much better, cheaper and much more safely than our old system," Ecker says. The solution saves the utility more than \$72 per day. **855/650-2214; www.aqualitec.com.**

Pump and mixer team to treat wastewater

Problem

Serving 11,000 residents, the Stafford (Conn.) Water Pollution Control Facility needed an upgrade.

Solution

To improve maintenance and equipment service life, plant personnel installed six 1.8 hp **Landia mixers** in the anoxic tanks as part of a new activated sludge process. Three 2.4 hp Landia axial flow pumps were added to the aeration basins to return nitrified mixed liquor to the anoxic tanks for denitrification. "Landia sent one of their skilled engineers to show our maintenance staff how to look after the pumps and mixers, which means we provide a better service to the people of Stafford," says Rick Hartenstein, chief operator.



RESULT

"We've become more efficient, had no downtime, saved money and had no hassle," says Hartenstein. **www.landia.co.uk.**

Aerators and mixers enable cost savings, reduce biosolids buildup

Problem

The town of Monroeville, Ala., faced aeration and mixing issues, sludge buildup in one of its wastewater lagoons, and power bills of \$12,500 per month after a major employer relocated its garment manufacturing facility. The company had generated about 90 percent of the wastewater entering the lagoon, and its fees covered 90 percent of the operation and maintenance cost, which included \$1,500 per month for aerator maintenance. The lagoon was 80 percent full of biosolids, and the estimated cost to dredge was over \$1.6 million. The lagoon had to remain operational and the town needed to reduce costs.



Solution

DO2E Waste Water Treatment installed two 5 hp high-volume floating aerators and two 3 hp floating mixers.

RESULT

In four years of operation, the equipment saved the town some \$513,000 in electricity and \$72,000 in maintenance, while reducing biosolids buildup by 90 percent. **251/626-6550; www.do2e.com.**

Reactor assists in cold-weather lagoon ammonia removal

Problem

The three-cell lagoon system at the City of DeSoto, Iowa, consistently met its permit until new effluent limits on ammonia required an upgrade. The city needed to nitrify efficiently in winter without the prohibitive expense and disruption of replacing the lagoon system.

Solution

DeSoto selected the **NitrOx System** from **Triplepoint Water Technologies**. The system leveraged the existing lagoon system and required no new land. The reactor was installed between cells two and three, allowing the lagoon system to treat BOD to 20 to 30 mg/L, at which point bacteria begin to nitrify. Influent from the aerated cell is pumped into the first tank of the reactor at an average rate of 0.5 gpm. Sensors and a digital controller optimize temperature during the coldest months, and an insulated cover retains heat. High surface area media are mixed and aerated via a full-floor grid to foster the growth of nitrifying bacteria. After eight hours of retention time, effluent is released into the polishing cell.



RESULT

Despite subzero temperatures, the installation achieved more than 99 percent ammonia removal at influent temperatures barely over 32 degrees F. It has consistently held that removal rate since installation. **800/654-9307; www.triplepointenv.com.**

Aerator retrofit enables city to meet nitrogen limits

Problem

The City of Ocala, Fla., faced tighter effluent nitrogen limits due to the presence of springs in the St. John's River basin. The city operates an Ovivo Carrousel plant.

Solution

Rather than add basins, the city retrofitted the Carrousel basins with dual-impeller **Excell aerators** and the automated internal recycle **EliminatIR gate** from **Ovivo USA**.

RESULT

The retrofits have allowed the city to more tightly control dissolved oxygen and nitrate recycles and reduce total nitrogen to near the limits of technology. **512/834-6000; www.ovivowater.com.**



Screening system enables plant to increase treatment capacity

Problem

The activated sludge wastewater treatment plant in Kiel, Wis., treats high-strength wastewater from cheese production. When dissolved oxygen in the aeration basins dropped too low, the cheese waste influent was turned down or shut off. Operators wanted the plant to process more cheese waste,

accept waste from septic haulers, increase biological treatment capacity, reduce biosolids costs, eliminate additional processing of primary solids, and reduce capital, operation and maintenance costs.

Solution

Plant operators ordered a demonstration of the **MicroScreen** from **M2 Renewables**. A submersible pump was placed in the splitter box that feeds the two primary clarifiers. The effluent from the unit flowed by gravity into aeration. The solids were compressed and sent to the lab for testing. Then the solids compactor was removed, and a 2 to 3 percent solids stream went straight to aerobic digestion.



RESULT

Performance results indicated a TSS reduction of 32 percent on average, BOD reduction of 20 percent, and 41 percent dry solids content of discharged material. For the cheese waste, TSS removal was 13 percent on average, BOD removal 16 percent on average, and volatile suspended solids 8 percent on average. The unit allowed the plant to process five times more cheese waste, accept waste from four septic haulers, and increase the heat recovered from the aerobic digester flare's thermal recovery loop. It also increased plant loading capacity for TSS and BOD, reduced biosolids production, increased biological treatment capacity and minimized odors. The city plans to incorporate the unit into its 2014 plant expansion. **949/380-9800; www.m2renewables.com.**

(continued)

Plant upgrades to cloth media filter system

Problem

A coastal development in eastern North Carolina had aging traveling bridge sand filters that were failing and required extensive mechanical maintenance. The plant was also upgrading from chlorination to UV disinfection, which required consistently low levels of TSS.

Solution

The facility installed **Fluidyne's Fixed Plate cloth media filter system**, meeting requirements for tertiary reuse-quality treatment. The systems use simple open-close pneumatic valves and gravity head to control filtering and backwash. No pumps are needed to create backwash flow; media panels remain fixed in place instead of being rotated past a spray or suction manifold. Media elements can be isolated and removed from the flow stream for maintenance or inspection without discontinuing flow to the entire filter or diverting flow.



RESULT

The system eliminated moving parts and wear items and allowed elements to be square or rectangular (versus circular), easing manufacture, installation, removal and maintenance, while maximizing treatment area within the tankage. The tertiary solution produced reuse-quality effluent. **319/266-9967; www.fluidynecorp.com.**

Filter helps city meet phosphorus limits

Problem

The operators at the Lakes Area Sewer Authority treatment plant in Cass County, Mich., sought an efficient filtration system to meet stringent summer phosphorus limits. The city wanted a high-rate filtration system with a small footprint to fit inside a small building, with low wash water usage, easy cleaning and low maintenance cost.

Solution

Based on a successful pilot test, the operators chose the **Fuzzy Filter** from **Schreiber** for its ability to achieve high phosphorus removal efficiency by capturing very small flocs (less than 5 microns) and reducing chemical consumption. The high-rate (30-plus gpm per square foot) filter has a small footprint and reduces heating requirements of the filter building.



RESULT

The unit consistently produced effluent with phosphorus below 0.2 mg/L (more than 98 percent removal efficiency). It provided more than 60 percent chemical savings and produced less than 2 percent wash water return. The operators are satisfied with its performance and ease of operation and maintenance. **205/665-7466; www.schreiberwater.com.**

High-speed blower unit used to upgrade old equipment

Problem

The 3.3 mgd (average) activated sludge Charleston (Ill.) Wastewater Treatment Plant needed upgrades to old equipment to reduce operating costs. That included replacing Hoffman multistage aeration blowers, which had served for 40 years with no failures.

Solution

Superintendent Dave Collard worked with the **Hoffman & Lamson, Gardner Denver Products** team to install an **RO7 Model Hoffman Revolution high-speed blower**. Its small footprint fits tight spaces. It is rated at below 80 dBA and 1 meter. A human machine interface with a smart touch screen makes it easy to use.



RESULT

In the first month, the city saved \$8,604, and over the next three years savings totaled about \$100,000 annually. **866/238-6393; www.hoffmanandlamson.com.**

Membrane retrofit maintains safe drinking water production

Problem

The ultrafiltration (UF) membrane cartridges used in the City of Del Rio (Texas) Water Treatment Plant needed frequent fiber repairs and had reached the end of their useful life. However, replacement using the existing specified membranes was beyond the facility's budget, forcing the city to pursue a retrofit. Most potential replacements either could not fit the existing footprint or were too costly.

Solution

After a comprehensive pilot test, **Koch Membrane Systems** custom-engineered a drop-in retrofit using their **TARGA II hollow fiber UF cartridges**. The custom racks included manifolds, connectors and membrane cartridges that fit within the original system and used existing components and controls. The company also assisted with installation and startup.



RESULT

The membranes performed cost-effectively. Robust fibers experienced minimal breakage. Systems engineers developed a custom retrofit design and incorporated spare positions into each rack for future additional membrane cartridges, providing an additional 5 mgd capacity. **978/694-7000; www.kochmembrane.com.**

Turbo blowers provide aeration for holding basins

Problem

The Frank E. VanLare Wastewater Treatment Facility in Rochester, N.Y., required an efficient aeration solution for its six holding basins.

Solution

Ten model **NX350-C080 blowers** from **APG-Neuros** were purchased by the county and commissioned in three phases over a nearly three-year period. The blowers have Schneider Modicon PLCs with hardwired controls from the AER PLC with Ethernet connections as backup. Aside from the reliable design, the clean operating environment is important to longevity and reliability.



RESULT

The site has been commissioned and the blowers have run reliably since their startup without incident. The availability level of the blowers has exceeded 99 percent during the past three years. **866/592-9482; www.apg-neuros.com. tpo**

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