

TREATMENT PLANT OPERATOR

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Beautiful Water



profile

Riviera Utilities Wastewater Treatment Plant, Foley, Ala.

BUILT:	1983; upgraded in 1998 and 2008
POPULATION SERVED:	4,720 residential and commercial customers
TREATMENT LEVEL:	Advanced secondary
FLOWS:	2.0 mgd average, 3.5 mgd wet weather
TREATMENT PROCESS:	Oxidation ditch
BIOSOLIDS:	Lagoon storage, land application by private contractor
STAFF:	Richard Peterson, superintendent; Lee Kibler, supervisor; Gene Durham, chief operator and laboratory manager; Robert Davis, operator; Lee Gilley, trainee; Dan Davis, instrumentation specialist
ANNUAL BUDGET:	\$1 million (operations)
WEB SITE:	www.rivierautilities.com



Team members at the Riviera Utilities treatment plant include, from left, Robert Davis, Gene Durham, Lee Kibler, Richard Peterson, Lee Gilley, and Dan Davis. They're shown in front of the plant's spiral clarifiers from Lakeside Equipment Corporation. (Photography by Trisha LaCoste)

THE STAFF AT RIVIERA UTILITIES CONSTANTLY IMPROVES THE TREATMENT PLANT WITH HOMEGROWN SOLUTIONS THAT LEAD TO CONSISTENTLY HIGH-QUALITY EFFLUENT

By Jim Force

MUNICIPAL WASTEWATER TREATMENT PLANTS ARE known for resourcefulness in the face of operational challenges. But if there were a “Do It Yourself” award for improvements this year, it might go to the gang at Riviera Utilities in Foley, Ala.

Operators at this 2.0 mgd plant that discharges to the environmentally sensitive Wolf Bay watershed have come up with several upgrades — improving treatment and saving money. Chief among the solutions: installation of a new Salsnes filter system, distributed by Blue Water Technologies, in the headworks. The system has increased solids capture and removal and has helped the entire plant reduce BOD and suspended solids.

“The improvement has been dramatic,” says operator Robert Davis. “We’ve cut TSS and BOD loads to the rest of the plant in half. Other plants visit us to see how the unit works.”

The Salsnes filter system, which uses an endless mesh screen, is only one of the in-house improvements. Davis and team members Richard Peterson, Lee Kibler, Gene Durham, Lee Gilley and Dan Davis have upgraded the aeration system in the plant’s oxidation ditches, replaced pumps in the lift station, and added new mixers and probes — all measures that made the plant function better.

BROAD-BASED SERVICES

Riviera Utilities provides natural gas, water and sewer, and cable TV services to some 4,700 customers in and around Foley, located midway between Mobile, Ala., and Pensacola, Fla., and just a few miles inland from the Gulf of Mexico.

Wastewater is collected through 13.5 miles of gravity mains, 16.4 miles of force mains, and 38 lift stations. The treatment plant has a 3.5 mgd capacity for storm flow, approved by the Alabama Department of Environmental Management. The plant was put into service in 1983, and upgraded in 1998 and 2008.



Robert Davis adjusts the Salsnes filter (distributed by Blue Water Technologies), one of the upgrades made by plant staff members to improve plant functionality and treatment performance.

Effluent from the treatment plant discharges to Wolf Creek.



From the wet well, influent is boosted to the Salsnes headworks filter, where debris and gross solids are removed by an endless mesh screen that moves upward, concurrent with the influent flow. The material is then dewatered and transported directly to a dump container.

Following a splitter box, three oxidation ditches accept, mix and aerate the flow, functioning as an extended aeration system. Nitrification-denitrifica-

“We changed the PLC logic to run the aeration system in on or off modes, based on ORP. It works great, especially in the summer months. Last year we produced the best effluent I’ve ever seen.”

LEE KIBLER

tion is achieved by operating the ditches in both aerobic and anoxic modes.

Solids settle in spiral clarifiers (Lakeside Equipment). The effluent passes through Trojan Technologies UV units for disinfection. Final effluent travels down a waterfall cascade channel to Wolf Creek. Pumps move waste biosolids to a storage lagoon, where a private contractor (Synagro) periodically removes the material, dewateres it and transports it to land application sites around the area.

GETTING BETTER ALWAYS

This simple flow scheme belies the amount of time and effort that the plant staff has devoted to making things work better. Their improvements to the facility have paid off handsomely. Staff converted the old main lift station dry well into a wet well, and replaced aging shaft-driven lift pumps with suction lift pumps from Gorman-Rupp Co. to increase capacity for handling storm flows.

The addition of the Salsnes filter has increased the removal of gross solids by three times over the old microscreen system. “We had labor-intensive screens that were delivering a partial container full of material every three days,” says Davis. “We looked around for something better. By word-of-mouth, we learned of the Salsnes filter system. We pilot-tested it, and it

worked great. Now, we get a full cubic yard — a container load — of debris every day, and we have other communities contacting us to learn more about our system.”

Plant supervisor Lee Kibler agrees. “It’s been fantastic,” he says.

Two of the plant’s oxidation ditches date to 1983 and were originally equipped with draft tube aerators. Both ditches have a capacity of around 200,000 gallons. A third 1-million-gallon capacity ditch was added in 1998, provided by Lakeside.

Recently, the Riviera staff upgraded the older units with new aeration equipment, mixers, and probes. “We gutted the older ditches,” says Kibler. “We started from scratch and performed the modifications ourselves with the help of our engineering staff and superintendent Richard Peterson.” It took about six months, during which flow was diverted to the other ditches that remained in operation.

“The aeration plumbing tubes were in bad shape,” Kibler says. “Corrosion of the galvanized plumbing resulted in inadequate aeration, and the handheld meter was giving us inaccurate DO readings. We contracted out the concrete removal and all the electrical installation, but our staff did everything else, including the process development work.”

BETTER LOGIC

The ditches are now equipped with rotary brush surface aerators (S&N Airoflo) and new probes (Insite) that include ORP monitoring so the ditches can be run as aerobic or anoxic zones to achieve total nitrogen removal.

“We changed the PLC logic to run the aeration system in on or off modes,

The treatment process uses surface aerators from S&N Airoflo Inc.

INSET: Plant supervisor Lee Kibler.

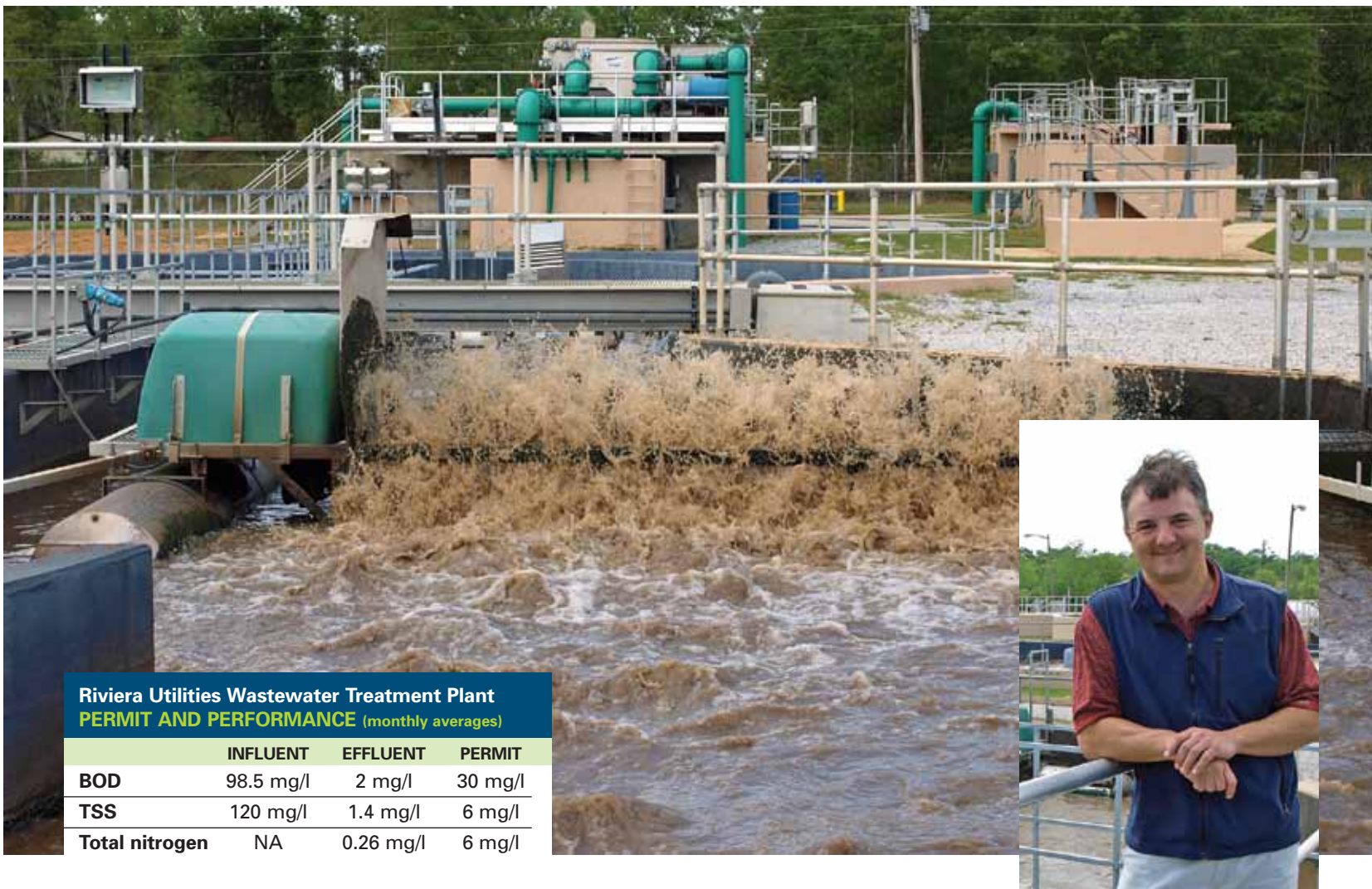
WATER AWARENESS

Clean water is precious anywhere, but even more so in South Alabama, where groundwater supplies are limited and runoff and other discharges can harm the Gulf of Mexico. That’s why Riviera Utilities encourages its customers to practice water conservation.

On the utility’s Web site, visitors get several practical suggestions for saving water — and money on their water bill. Some examples:

- Check your washing machine to make sure the water level on the dial matches the water level inside the machine.
- Like to water your yard? Get a separate water source for watering that beautiful green and save on your sewer costs — or collect rainwater.
- Properly chlorinate water in swimming pools — even the inexpensive backyard kiddie pools, so you don’t have to refill with water as often.
- Thaw frozen food in the refrigerator instead of running water over it.

Other tips advise customers to use water-saving appliances, check all water lines for leaks and drips, take short showers instead of baths, and use a broom instead of a water hose to clean off driveway or sidewalk debris.



Riviera Utilities Wastewater Treatment Plant
PERMIT AND PERFORMANCE (monthly averages)

	INFLUENT	EFFLUENT	PERMIT
BOD	98.5 mg/l	2 mg/l	30 mg/l
TSS	120 mg/l	1.4 mg/l	6 mg/l
Total nitrogen	NA	0.26 mg/l	6 mg/l



Lee Gilley (left) and Dan Davis perform planned maintenance on the plant's Gorman-Rupp suction lift pumps.

facility. "It's neat," says Davis. "It relates directly to what we see in the plant." For example, the DO ppm values appear directly over the image of the brush aerators on the map.

The headworks is tied in as well, as the SCADA system monitors the belt speed of the new Salsnes filter, hot water on and off, any overflow conditions in the wet well, and more, at 5-second real-time intervals.

The SCADA system also helps monitor some of the innovations the Riviera crew is working on for the future. One example is a percolation pond with natural vegetative treatment of effluent for additional nutrient removal.

About 13,000 gallons of effluent a day are directed to a nearby pond containing a variety of plants that take up nutrients. Then, a series of wells pulls the treated water back out of the ground to the plant's UV units for disinfection and final discharge.



UV lights on the facility's Trojan disinfection units.

"I'm an old codger, and I've been other places where the feeling isn't the same as it is here. We're a team and everybody's on board. I was surprised when I came here. Everybody joins together, cooperates, and tries to do the best they can."

GENE DURHAM

"We're meeting our nutrient loading limits, but we want to explore how we might achieve even greater reductions," Robert Davis says. "We want to get better." Housing development in this popular winter destination stalled during the recession, but the team knows it will come back. Meanwhile, they're taking advantage of the break and getting ready for the time when development and growth return.

TOGETHERNESS HELPS

The success of homegrown solutions at Riviera Utilities would be unlikely without teamwork and a strong sense of camaraderie among the staff. Gene Durham, chief operator and manager of the treatment plant laboratory, has been in the public wastewater profession for 40 years and thinks the success comes from a collective positive attitude.

"I'm an old codger, and I've been other places where the feeling isn't the same as it is here," he says. "We're a team and everybody's on board. I was surprised when I came here. Everybody joins together, cooperates, and tries to do the best they can. If we need to pull a pump, or clean up an area, we all work together. As a result, we put out beautiful water." **tpo**

more info:

Blue Water Technologies

888/710-2583
www.blueh2o.net

Gorman-Rupp Company

419/755-1011
www.grpumps.com

Insite Instrumentation Group

985/639-0006
www.insiteig.com

Lakeside Equipment Corporation

630/837-5640
www.lakeside-equipment.com

S&N Airoflo

877/247-6356
www.airoflo.com

Synagro Technologies Inc.

800/370-0035
www.synagro.com

Trihedral Engineering Limited

902/835-1575
www.trihedral.com

Trojan Technologies

519/457-3400
www.trojanuv.com

based on ORP," explains Kibler. "It works great, especially in the summer months. Last year we produced the best effluent I've ever seen at this facility."

Kibler says that long sludge ages during the colder winter months can create problems with filamentous growth, but the staff is working on that. "Once we get a portion of the old lagoon set up as an equalization basin, we'll be able to shut down one of the ditches during the winter, bank flow during the day, and bleed it back in at night. That should solve the excess capacity issue."

That old lagoon system is filling multiple functions, in addition to the equalization role Kibler is eyeing. A portion of it serves to store waste biosolids until the material is picked up by Synagro. Another section provides capacity for excess wet-weather flows. "Our sewer system has some old sections, and we experience serious infiltration and inflow issues from time to time," says Davis. "The lagoon provides a safety factor for rain events. We love it."

INSTRUMENTS AT WORK

Plant controls are getting continuous upgrading, too. Instrumentation specialist Dan Davis has been strongly involved with the plant's VTScada system (Trihedral Engineering Limited) for nearly a year, programming a variety of applications. "It's great information," he says, "the eyes and ears of the plant."

One innovation involves overlaying data on top of aerial maps of the