

CREATING A JEWEL

JAMES STEWART FOLLOWED HIS MOM'S ADVICE INTO THE WASTEWATER PROFESSION. HE NOW LEADS AN AWARD-WINNING TEAM AT A TEXAS TREATMENT FACILITY.

By Trude Witham

JIM STEWART CREDITS HIS MOTHER FOR GETTING HIM started in the wastewater treatment field. His career has spanned 30 years, first in his native Colorado as a wastewater treatment operator, and now in Texas, where he supervises five operators at the 4.75 mgd (design) advanced secondary treatment Floyd Branch Wastewater Treatment Plant in the Dallas suburb of Richardson.

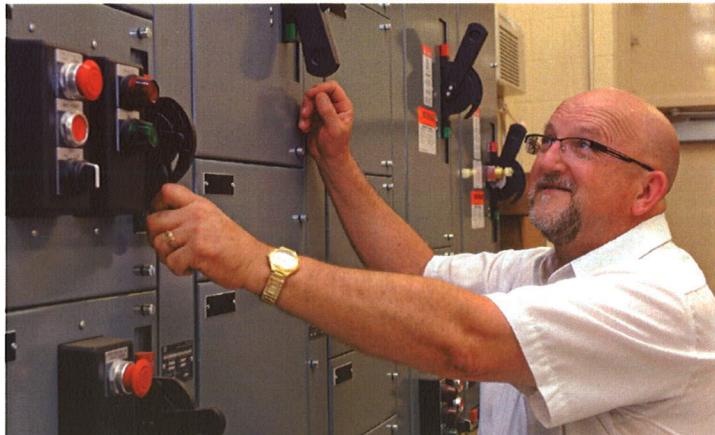
A recipient of the 2009 Texas Water Utilities Association (TWUA) Operator of the Year Award, Stewart recently oversaw a major upgrade of his plant, now considered a jewel of the North Texas Municipal Water District (NTMWD). He credits much of his success to an outstanding team of operators.

Stewart keeps his five-member team engaged and enthusiastic with an emphasis on training and a management style that gives team members considerable autonomy. He expects them to take responsibility for identifying and addressing treatment issues.

That leads to solid performance. The plant has earned recognition from the National Association of Clean Water Agencies that include Gold awards (no permit exceedances for a year) in 2000, 2003 and 2004, and Silver awards (two or fewer exceedances) in 2002 and 2005-2007.

MOTHER'S INFLUENCE

"My mom was an office manager for a small water district in Colorado," says Stewart. "She said if you want a secure job, go into the water treatment field."



Plant supervisor Jim Stewart and his team at the Floyd Branch Wastewater Treatment Plant turned an older facility into a top performer that is considered a jewel of the North Texas Municipal Water District system. (Photography by Ross Skeegan)

When he graduated from the University of Southern Colorado with a degree in industrial arts, his mother encouraged him to go to school for his wastewater certification. He attended a night class in Canon City, Colo., and also learned about the wastewater treatment process by studying with the operators at the wastewater plant in the district where his mother worked.

After obtaining his entry-level certification in wastewater treatment, he started his career as an operator at a small plant called Widefield Water and Sanitation near Colorado Springs, where he found a mentor in lab technician Larry Bishop.

"Larry took me under his wing and taught me the ropes," says Stewart. "You always have that one person who makes a difference in your life. I still use what he taught me — that the accuracy of your sampling is the most important thing. Was it taken in the right place? Was the test run properly? That affects how you run your plant."

Bishop taught him to use his senses — sight, smell and hearing — when walking around the plant. He told him that if something doesn't look, smell or sound right, then something is wrong.

Stewart moved to Texas in 2000 because he needed a change. He started at the North Texas district as a wastewater operator at the Wilson Creek Wastewater Treatment Plant, and was then promoted to coordinator. When one of the Floyd Branch supervisors retired, the district brought Stewart in to run that plant. He became plant supervisor after three months.



Jim Stewart switches a sand filter from Aqua-Aerobic Systems into the manual mode. The Floyd Branch plant benefited from a major upgrade in 2008.

profile

**Jim Stewart,
Floyd Branch Wastewater Treatment Plant,
North Texas Municipal Water District**



POSITION: Plant supervisor

EXPERIENCE: 30 years

EDUCATION: University of Southern Colorado (industrial arts degree); average of 10 CEUs in wastewater per year for the past 10 years

CERTIFICATION: Texas Class A and Colorado Class A, wastewater operations

MEMBERSHIP: Texas Water Utilities Association

GOALS: Make the plant more energy efficient

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JIM STEWART

"My advice for other supervisors is: Don't ask your employees to do anything you wouldn't do yourself. Always treat them with respect."

JIM STEWART

RIGHT PHOTO: The Floyd Branch treatment plant team includes, from left, chief operator Allen Gooch, operator II Curtis Smith, operator trainee Tony Raines, operator I Mauricio Lazalde, and plant supervisor Jim Stewart. Not pictured is operator II Noe Guzman. LOWER PHOTO: Stewart and Gooch check the quality of biosolids at the Charter Machine gravity belt thickener.



OVERSEEING AN UPGRADE

The Floyd Branch plant is one of 18 plants in the district. It was built in 1954 as a trickling filter plant and upgraded in 1963. In 1986, the district built a separate activated sludge plant, and the two plants operated side-by-side, with a combined flow but one permit and a single outfall.

"We referred to the two plants as the 'old side' and the 'new side,' and we combined the two flows because of permit constraints," Stewart says. "The flow from the old plant combines with the new plant before the flow goes to the sand filters."

In 2008, the district completely upgraded the activated sludge plant and kept the trickling filter plant mainly as a backup (it now processes about 15 percent of the flow). "Not only was it an old plant, but we wanted to improve aeration treatment for better ammonia removal and for plant safety," Stewart says. "I was happy to contribute to the design by offering my input on what equipment I preferred and what equipment I didn't think would serve our purpose."

The upgrade included a primary clarifier laundromat cover and Calgon Carbon filter foul-air scrubber. Environmental Dynamics Inc. (EDI) fine-bubble aeration with plug flow replaced a coarse-bubble aeration system for better ammonia removal and to meet future ammonia limits, in case they become stricter.

A WesTech secondary clarifier was added as a backup to the existing unit, and a new solids dewatering building was constructed with a Siemens dual-media chemical scrubber odor-control system. The project also included an

LET THEM DO THEIR JOB

The operators under Jim Stewart's supervision at the Floyd Branch Wastewater Treatment Plant love their work, and part of the reason is Stewart's belief in training and the supervisory skills he has built.

"I do a lot of training, reviewing material in books and preparing them for certification tests," Stewart says. "I've taught them to where if they see mixed liquor getting too light and solids building up, they can fix it instead of calling me up and asking if they can do this. That is how they learn. And if they make a mistake, they make a mistake. I won't chastise them. I have learned this from my managers."

Stewart encourages operators to use their senses to detect problems with the plant, just as his mentor, Larry Bishop, taught him years ago. "This is not just busy work," he says. "You have to get out there every few hours and listen and look. My operators can always find a problem and can hear a part starting to seize up."

Allen-Bradley (Rockwell Automation) motor control center power transmission system with switchgear and a generator switchover system.

ADVANCED PROCESS

All flow enters the plant through two outfall lines (15 and 24 inches) and passes through a Lakeside Equipment Corp. fine-screen bar screen before entering the wet wells of the influent pump station.

The flow is then split into two treatment trains of 2.25 mgd and 2.5 mgd capacity. The 2.5 mgd train consists of three Clarigesters (a clarifier with a Dorr-Oliver [Ovivo] digester underneath), two trickling filters, and a final clarifier.

The 2.25 mgd train has a primary clarifier, two parallel aeration basins and two secondary clarifiers. The solids are dewatered with a Charter Machine 1.2-meter gravity belt thickener and a 1.0-meter Ashbrook Simon-Hartley belt filter press.

The screened influent to the 2.25 mgd train is pumped to a primary clarifier. From there, the wastewater gravity flows to two parallel plug-flow aeration basins. The mixed liquor from the aeration basins flows equally to the two secondary clarifiers.

Floyd Branch Wastewater Treatment Plant PERMIT AND PERFORMANCE

	INFLUENT	PERMIT (daily avg.)	EFFLUENT (6-month avg.)
TSS	147.7 mg/l	15 mg/l	1.68 mg/l
CBOD	171.8 mg/l	10 mg/l	2.6 mg/l
Ammonia Nitrogen	17.1 mg/l	2.0 mg/l	0.16 mg/l
		March-Nov. 4.0 mg/l	Dec.-Feb.

Effluent from the secondary clarifiers re-combines and flows equally through two automatic backwash traveling bridge dual-media filters. Chlorine solution is fed ahead of the filters for disinfection and algae control.

The flow then passes through two chlorine contact basins for disinfection and is dechlorinated before discharge to the Floyd Branch tributary of Cottonwood Creek, which flows to White Rock Creek and ultimately to White Rock Lake in the Trinity River Basin. The plant has a non-potable reuse system for irrigation and plant water.

SUBSTANTIAL IMPROVEMENT

Completed in mid-2009, the upgrade has greatly improved effluent quality. "When we started this in 2008, my objective was to make this the best plant in our district, and I feel we have achieved that," says Stewart. "We did everything right."

The plant's June 2010 water quality report showed removal rates of 99.6 percent for TSS, 99 percent for CBOD and 99 percent for ammonia nitrogen. The plant's six-month average before the upgrade began was 96.6 percent TSS removal, 97.5 percent CBOD removal, and 95.4 percent ammonia-nitrogen removal.

"Our contact chamber is 15 feet deep," says Stewart. "You could drop a quarter in there and see it at the bottom — that's how clean the water is now."

Stewart takes great pride in his plant's achievements. "I look at this as a competitive thing. With those removal rates, we were top dog compared with the other plants. We're one of the smaller plants, but we're up there with the big guys."

"I was happy to contribute to the design by offering my input on what equipment I preferred and what equipment I didn't think would serve our purpose."

JIM STEWART

The plant has a small lab for daily tests such as oxygen, pH and settleables. Major tests, such as TSS, CBOD and ammonia, are done at the district's main lab in Wylie. Although the district has a maintenance department, the operators at the Floyd plant try to do whatever maintenance they can. They also keep up with the yard work on the plant's five acres, mowing, trimming weeds and planting flowers.

A GREAT TEAM

Stewart credits his operators with keeping the plant in great shape and the effluent quality high. "I never have to worry about personnel issues," he says. "One of my operators said he used to hate coming to work, but that since I took over, he loves coming to work because I make the job interesting. I have another operator who has been with us for six years, and he says this is the best job he ever had. He motivates the other guys."

Allen Gooch, chief plant operator, has been in wastewater for 34 years and with the district for 23. He holds a double Class B license in water and wastewater. Curtis Smith, operator II and maintenance planner, has 30 years in wastewater, and 23 with the district. He holds a Class C wastewater license.

Noe Guzman, operator II, has been with the district for five years and holds a Class C wastewater license. Mauricio Lazalde, operator I, has been

in wastewater for three years, two with the district. He holds a Class D wastewater license. Anthony Raines, operator trainee, has been with the district for four years.

MULTIPLE AWARDS

Stewart's supervisory talents and the plant's high-quality effluent have earned recognition. Besides the 2009 TWUA award for plants in communities with 30,000-60,000 population, Stewart was nominated for the district's 2005 Carl Riehn Employee of the Year Award. He has been nominated every year since.

"The nominations are made to a committee in the district, and it's a large district with over 600 employees," he says. "So, just to be nominated is an honor."

Stewart says the plant will stay small: Except for plans to add UV disinfection and a security and surveillance system, there are no immediate plans to expand. "We're a gravity-feed operation with no lift station, and unless we need to start treating more wastewater, we don't need to upgrade," he says.

The plant treats mostly residential wastewater, and the biggest challenge is getting enough bacteria. "Sometimes my influent TSS is under 100, and I am begging for someone to send me some bugs," Stewart says. "And that's when you really have to watch what you're doing with the treatment process."

Stewart would like the plant to become more energy efficient. The district has looked at cogeneration with digester methane, and at adding solar panels or a wind generator. He would also like to add a digester, rather than just process the sludge to send to the landfill.

"We are using non-potable water to blend with our dewatering polymer, and we also irrigate our site so that it looks like a park," Stewart says. "But we would like to do even more to save energy and become more environmentally conscious."

In the meantime, Stewart will continue to do what he does best: motivate his operators to do their greatest work. "My advice for other supervisors is: Don't ask your employees to do anything you wouldn't do yourself. Always treat them with respect." **tpp**

more info:

Aqua-Aerobic Systems, Inc.

800/940-5008
www.aqua-aerobic.com

Ashbrook Simon-Hartley

800/362-9041
www.as-h.com

Calgon Carbon Corporation

800/422-7266
www.calgoncarbon.com

Charter Machine Company

732/494-5350
www.chartermachine.com

Environmental Dynamics Inc.

877/334-2478
www.wastewater.com

Lakeside Equipment Corporation

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

Ovivo

801/931-3000
www.ovivowater.com

Rockwell Automation

519/623-1810
www.rockwellautomation.com

Siemens Water Technologies

866/926-8420
www.water.siemens.com

WesTech Engineering Inc.

801/265-1000
www.westech-inc.com