Quality treatment: Cleaner water goal at new waste plant

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Autumn Crawford is manager for the Zelienople-based Western Butler County Authority. She is helping the authority build a plant with larger capacity.
KIM PASKORZ/BUTLER EAGLE

Autumn Crawford speaks fiercely and fearlessly about her passion …. which just so happens to be sewage treatment.

Crawford, manager for the Zelienople-based Western Butler County Authority for the past six years, takes her career and her role as an environmental steward very seriously.

She's helping to lead the authority in a rebuild that she hopes “sets the standard” for wastewater treatment.

Preparations are underway at the authority to build a plant with larger capacity beginning in about two years. Crawford hopes to utilize that renovation opportunity to incorporate relatively new technology to eliminate chemicals from the process and ultimately release cleaner water.

“The (systems) we are using have the ability to revolutionize wastewater treatment in the quality of the water we put back into the waterways,” Crawford said. “We are setting the bar, and hoping everyone else after us does better.”

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Well-suited resume

Mark Gordon, Butler County chief of economic development and planning, said he's constantly impressed with Crawford.

“Aside from being astute and capable, she's not afraid to look at classic problems and utilize cutting-edge technology solutions,” Gordon said.

Additionally, Gordon noted Crawford's partner-building skills allow her to create business-government collaborations “and accomplish some powerful stuff. She advocates responsible chlorine use, but is actively perusing the elimination of all chlorine. That's revolutionary.”

Gordon said Crawford draws insight from her particularly “well-suited” background for this job.

Found her path

Crawford started working in treatment plants, literally, at the bottom of the totem pole.

“Shoveling sludge,” said Crawford, whose father is Mike Davidson, former manager of Breakneck Creek Regional Authority and owner of M. Davidson and Associates in Jamestown. “That's the family business. I started working there before I could drive.”

With an inherent desire to “make a difference” in the world, Crawford initially sought a career in psychology.

Ultimately she began counseling youth with drug and alcohol abuse issues. But two years in, she found herself, “riding a medical helicopter with (a teen) who had been jumped by five other kids. When that happened, I put my two weeks in. I knew I could not have an impact in that environment.”

Crawford tried a few other paths before returning “home” to wastewater management.

“Ironically, I don't think I could ever make a difference there (in a psychology career),” said Crawford, 32. “Here, which seemed like an unlikely place to make positive change on the world, I have an opportunity to make a huge difference.”

Crawford became the authority manager in 2014 and, today, she also is vice chairwoman of the professional wastewater committee for the Pennsylvania Water Environment Association, which is a division of the national Water Environment Federation.

“Our job is to make better wastewater operators,” Crawford said.

Growing pains

The Western Butler County Authority employs 11 people including Crawford. In addition to the plant, the authority has six pump stations and 60-plus miles of main sewer lines. It serves about 3,600 customers and 4,700 Equivalent Dwelling Units, EDUs.

“We're growing rapidly,” said Crawford, pointing to the authority's service area, which includes Zelienople and Harmony and Jackson and Lancaster townships. “Comparatively, only five years ago, we had 2,800 customers and 3,500 EDUs.”

A growing customer base is one reason the plant is looking to expand. The other is aging infrastructure — some of the lines in Harmony and Zelienople date to the 1920s. This means in some areas, other waters can get into the pipes, then into the plant.

Crawford said almost every house in some neighborhoods with older lines would fail a lateral inspection test. Instead of trying to Band Aid each problem in the community, the authority is looking to upgrade the plant, which was constructed in 1939, and upgraded in 1959 and 1977.

“The plant design in the '70s was never intended to accommodate additional capacity and I&I (inflow and infiltration),” Crawford said. “Dollar-for-dollar, it's better to build a facility large enough to accommodate flow than correct the I&I.”

Specifically, Crawford said current basins are too shallow for swings between low and high flow, which can be significant. Crawford explained there are many avenues — including outdated sump pumps, French drains or laterals with leaky joints — that water seeps into the sewer lines.

Officials are in the design phase for the plant and recently finished a flow-monitoring study.

“We have between 18 million gallon max and 24 million gallon max for a 2.2 MGD (million gallons per day) plant,” Crawford said. “Those numbers are astounding.”

Authority board member Greg Such said sewage treatment is a “tremendously regulated” industry, and the authority feels fortunate to have Crawford navigating those issues with the engineering team.

“As well as her ability to plan and look down the road,” said Such, who noted the new plant when finished within the next five years will accommodate predicted growth another five years into the future and have room for easy expansion when needed.

All officials involved say it is too early to put a cost estimate on the project.

The hope is to start construction in two years with work being completed in phases so that the service remains operational during the transition. The original 1939 tank, Crawford said, will be demolished.

Window of opportunity

The primary concern prompting construction of a new plant is volume of flow during storm events.

“But when you are designing, you look and say, 'What types of attributes do I want this project to have?'” Such said. “We have worked through those decisions to guide in the design.”

Ultimately, the upgrade will give officials a window to tackle an issue Crawford feels strongly about: clean treatment methods.

“Our plant uses 40-year-old technology for solid sludge treatment,” Crawford said. “It's time for something better.”

Crawford explained that when wastewater reaches the plant, it goes through a number of processes before being returned to the waterway, in this case the Connoquenessing Creek.

At present, some of those include the use of commonly accepted chemicals.

“Almost every treatment plant everywhere uses chemicals,” Crawford said, noting that a type of chlorine is traditionally used for disinfecting similar to the way it is used in drinking water and swimming pools. “It's very common.”

Although officials do their best to minimize chemical use, it still is needed in the current process.

“So why is that bad? Every chemical we use in treatment has the potential to have a chemical reaction in a way that we cannot predict,” Crawford said, noting the water released from the authority, for example, will travel ultimately to the Gulf of Mexico.

“That's a long way to go,” Crawford said. “As (chemicals) go downstream, they can encounter other chemicals and mix and mutate.”

Chemicals in the waterways, as well as pharmaceuticals that people contribute accidentally and intentionally to sewage, are suspected cause for wildlife genetic mutations and onset of some human medical conditions, Crawford said.

“Someone is using that for their drinking water source or to irrigate their crop fields or water their livestock,” Crawford said. “It's full circle to how we are impacting the environment, and it is impacting us.”

A Western Butler County Authority employee tests a water sample.
KIM PASKORZ/BUTLER EAGLE

Home-grown technology

The new plant design incorporates a number of initiatives including simultaneous nitrification–denitrification (SNdN), UV disinfection and a relatively new filtration technology called TARON.

“It's revolutionary and homegrown, right here in Zelienople at Leopold (Xylem) … that's literally at the end of our driveway,” said Crawford, who stressed that the program was tested and piloted at the Western Butler County Authority over the past year.

“It's new technology in the way that it operates, but not new in the way that it works,” Crawford said. “They took things (the system) did well and made it better. Then removed things that it did not do well.”

According to its website, TARON is a rotating disk system that takes measures to avoid common fouling issues.

“We have seen the numbers and seen the quality. We got really excited about it,” Crawford said.

Additionally, Crawford said, the UV component will allow the plant to disinfect — kill viruses and pathogens — without the chemicals.

“Those components together will allow us to treat wastewater beginning to end without chemicals,” Crawford said,

“We have come a long way since the first wastewater system was installed in Philly 200 years ago. But we have a long way to go,” Crawford said. “We need to keep up with society.”

Environmental stewards

Crawford said she believes “first and foremost, wastewater treatment officials have a primary job to act as environmental stewards … if we don't do it, who will?”

In keeping with that concept, Crawford said the authority, for its new plant design, called on a collaboration “of the best ideas of best minds … We want to be able to say, 'If you're not designing to this standard, you aren't doing it right.”

Butler County Business Matters will focus on education in its October issue.