

Keep Chesterton
Beautiful

Chesterton Stormwater Utility staff worked with Chesterton High School students on graphic design projects. From left, Jennifer Gadzala, MS4 operator; Jessica Lohse, high school sophomore; Jannon Jeffries, high school senior, and Kirsten Renehan, high school art teacher. (Photography by Daniel Bruhn)

FOCUS: STORM

ALWAYS AN EDUCATOR

Whether working with developers or mentoring middle school students, Chesterton's Jennifer Gadzala makes an impact on stormwater quality

By *Scottie Dayton*

Chesterton Middle School science teacher Samantha Hayes, left, and Jennifer Gadzala prepare a water sample for testing along Coffee Creek.

Elevating a stormwater quality management plan from the industry template to a dynamic program was a challenge relished by Jennifer Gadzala, MS4 operator in Chesterton, Ind.

To help developers and contractors comply with town ordinances, Gadzala works with them throughout the construction process, does post-construction follow-ups, and even walks sites to identify potential improvements. Along the way, she revised construction requirements to reduce paperwork and simplify the process.

Her efforts have helped lead to installation and proper maintenance of numerous best management practices that help reduce runoff pollution to the area's waterways.

In her free time, Gadzala mentors girls interested in science, technology, engineering and math. Helping them prepare for their futures gave her the idea of combining education and outreach programs with student career goals. "I wanted them to learn more than just the water-quality message," she says. "I wanted to give them a taste of working in the real world on actual campaigns."

High school teachers and the community rallied to the cause. From 2008 to 2010, students created the town's watershed signs, a Keep Chesterton Beautiful logo, and a video on how litter contributes to water pollution. In 2009, the Indiana Department of Environmental Management recognized Chesterton's MS4 program for excellence.

Under construction

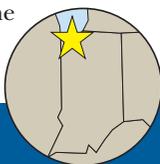
Chesterton, a town of 12,000, lies 50 miles southeast of Chicago, near Indiana Dunes State Park. Its 9.4 square miles touch seven sub-watersheds within the Lake Michigan watershed.

A cumulative sewer fund addresses individual flood-control cases, while a stormwater fee gen-

erates \$430,000 annually for water-quality programs. The Street Department maintains Chesterton's 40 miles of separate stormwater pipes, 111 outfalls, and more than 500 manholes.

Private entities own many best management practice facilities. They include seven wetland systems, one bioretention pond, three lakes encompassing three to 14 acres, seven infiltration swales, one section of porous pavement, two underground stormwater chambers, multiple stormwater separators, one green roof, and a level spreader system (see sidebar).

To persuade developers and contractors to comply with town ordinances, Gadzala began providing one-on-one assistance and unifying construction requirements. The utility created a construction project packet with checklists, guidance, and application forms. After reviewing the paperwork and



PROFILE: Storm Water Utility, Chesterton, Ind.

FOUNDED:
1989

POPULATION:
12,000

SERVICE AREA:
9.4 square miles

EMPLOYEES:
5

ANNUAL RAINFALL:
37 inches

INFRASTRUCTURE:
40 miles of stormwater collection and conveyance, 111 outfalls, 500+ storm manholes

OPERATING BUDGET:
\$430,000 (water quality)

WEBSITE:
www.chestertonin.org



ENGINEERING SUCCESS

Coffee Creek Center, a newer development in Chesterton, Ind., is protecting and enhancing the 15-square-mile Coffee Creek watershed by using best management practices. Its most ambitious effort coordinated with the Coffee Creek Watershed Conservancy, a 167-acre preserve in Chesterton.

"This is our only hilly area, and runoff from roads and parking lots was polluting Coffee Creek, raising water temperatures, and harming the biological community," says Jennifer Gadzala, MS4 operator for the town.

JFNew and Associates of Walkerton, Ind., and Conservation Design Forum of Elmhurst, Ill., designed an underground storage system known as level spreaders and tied it to ponds and expanses of restored prairie to control and treat the runoff.

The sequential infiltration system directs stormwater to exfiltration manholes spaced along distribution pipes, then to a fingered network of perforated detention pipes for storage and percolation. The overflow enters a pond. When the water level exceeds the pond's capacity, the excess spills through a manifold system onto the restored prairie.

Water in the distribution system enters a transmission pipe that feeds laterals to the upper two level spreaders. The horizontal spreaders are installed flush in a hill that drains away from the pond. If the topmost pipe fills faster than water can drain through the perforations, it spills out through an open grating covering the pipe and runs down to the next spreader. The process repeats through 10 rows spaced 12 inches or more apart, depending upon the slope of the hill. The hill is planted in prairie vegetation.

approving the development's stormwater pollution prevention plan, Gadzala holds a preconstruction meeting to discuss requirements and maintenance expectations.

"In 2008, we required developers of new properties to create a post-construction narrative for all stormwater management structures," says Gadzala. "It's basically a maintenance plan that became very successful."

The plan for commercial developments stays with the owner and explains how often structures should be checked and cleaned. Property owner associations retain residential development plans and are responsible for maintaining structures' capacity, clearing the pipes, and keeping the water trash-free.

Guiding hand

Besides working with developers and contractors throughout the construction process and doing a post-construction follow-up, Gadzala spends hours walking sites to identify potential improvements. "Construction is down right now," she says. "Some sites are mostly vacant, but they all have disturbed soil. The contractors worked hard to lay down ground cover last fall, but if I point out areas needing a little more work, I can help them remain compliant."

Gadzala's most challenging best management project was a new school gymnasium. The Little Calumet River was just north of the

three-acre site, and the building sat atop a deep ravine running to the floodplain. "An area to the east collected a lot of water, and we weren't expecting it to run through the disturbed site with such velocity," she says.

As construction proceeded, Gadzala noticed that water was tearing down straw bales, wattles and silt fences, allowing soil to erode. The site also had a new half-acre detention pond that was discharging at the top of the ravine.

"We sought solutions within the project's budget," says Gadzala. "It became apparent that redirecting the flow was too expensive. We worked with the developer and created a swale with three check dams between the gymnasium and the woods to slow and contain the water before it hit the ravine."

"In 2008, we required developers of new properties to create a post-construction narrative for all stormwater management structures. It's basically a maintenance plan that became very successful."

Jennifer Gadzala

Reasonable expectations

When Gadzala joined the utility in 2006, she evaluated the six minimum control measures of the stormwater quality management plan for what was and wasn't doable. For education and outreach, she obtained materials from the Northwestern Indiana Regional Planning Commission, but the information didn't always focus on what she believed was

important to residents at the time.

"I'm a dog owner, and seeing people not pick up after their pets motivated me to launch a Let's Talk About Poop campaign in 2009," says Gadzala. "We bought doggie bag dispensers that attach to leashes, designed a logo for the dispensers, and created a double-sided postcard explaining why cleaning up pet waste is healthy for humans and the environment." At Bark in the Park, a day of games and races with dogs, Gadzala handed out 400 dispensers.

In spring 2010, she began a Leave It On The Lawn campaign that stressed the benefits of allowing grass clippings to decompose in situ. "The Street Department hauled 320 tons of clippings to its compost facility in 2008 and 2009, traveling more than 1,362 miles

and costing taxpayers \$3,800," says Gadzala.

A newspaper insert on the subject reached 4,800 homes, while brochures were left in a box at the compost facility. On weekends, Paul Thorpe, a seasonal Street Department employee, hands brochures to people arriving with clippings.

School days

In 2007, Gadzala approached Chesterton Middle School with the idea of creating a four-week water-quality and conservation unit for seventh grade science students. Working with science teacher Samantha Hayes, Gadzala developed the Watersheds and Non-Point Source Education Unit.

One idea was to teach students the fundamentals of testing water downstream from farms and developments. Hayes collected the samples, and 165 students tested them for dissolved oxygen, phosphates, nitrates, pH, and turbidity to determine which land uses contrib-

uted the most pollutants.

"We always change the final assignment," says Gadzala. "In 2008, the kids made information boards from their test results, then talked about what they had learned at a town council meeting. In 2009, they designed brochures that we put in the library and school administration office. Last year, they wrote news articles."

Each year, the curriculum changes a little. For 2011, pupils also sampled for *E. coli*, then used



Watersheds and Non-Point Source Field Day, May 12, 2010.

math skills to graph the information. They pulled garlic mustard, an invasive species, and cooked it in the classroom. "Yes, garlic mustard is bad in the environment, but early settlers used it in cooking and for its supposed medicinal properties," says Gadzala.

In the field

Gadzala designed the course to end with an all-day field trip. Made possible by the assistance of local partners, it simulates how scientists work in the field and enables students to use skills learned in the classroom.

At Coffee Creek Park, Save the Dunes volunteer Erin Crofton helped the group test Coffee Creek's water quality. Volunteer Jennifer Nebe taught the youngsters how to build a rain garden, and they also pulled garlic mustard and Canada thistle.



Educational endeavors include campaigns launched to educate children and the general public.



Jennifer Gadzala and Jannon Jeffries discuss the attractiveness of a watershed sign design.

Students also collected more than 300 pieces of garbage from roadsides and toured the Chesterton Wastewater Treatment Plant. Finally, wetland expert Steve Barker led the group through the Coffee Creek Watershed Conservancy.

He discussed the role of wetlands in watersheds and the plants, animals and insects found there. Joe Exl, a volunteer from the Northwestern Indiana Regional Planning Commission, kick-sampled the stream bottom to collect

macroinvertebrates, then explained how they indicate water quality.

Real-world experiences

In 2009, when the utility sponsored a contest for Chesterton residents to design a watershed awareness poster, 14 of the 15 designs submitted came from Chesterton High School art students. A public vote chose junior Jannon Jeffries' design, which was ultimately printed as signs. Street commissioner John Schnadenberg and his staff helped coordinate the sign placements.

The contest gave Gadzala more ideas. In spring 2010, she approached art teacher Kirsten Renahan and proposed treating her students as if they were graphic designers in an advertising agency. Gadzala, the client, would hire them to create a logo for the utility's Keep Chesterton Beautiful campaign.

"I told the students about the campaign goals and what I was looking for, then critiqued the designs," Gadzala says. "I picked the logo by sophomore Jessica Lohse. It appears on our cam-

paign literature and website."

Gadzala also worked with high school video teacher Matthew Waters. "As the client, I wanted a 30-second educational video on litter reduction and recycling that tied into the Keep Chesterton Beautiful campaign," says Gadzala. "Teams submitted their work, and I chose one written and produced by Jake Webb, Kristen Pesut and Mike Lara." The video is on the town's website.

Gadzala has learned never to assume that people are interested in water quality. To reach the unreachable, she has found innovative ways to inform and educate, going above the standard templates to excellence. ♦

MORE INFO:

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