



down to earth

Environmental Restoration Quarterly • Winter 2023

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Project Spotlight—Locust Wetland

By Elizabeth Spencer, Watershed Restoration Engineer

The Bureau of Resource Management has recently completed a constructed wetland stormwater facility located adjacent to Little Pipe Creek in Union Bridge. The County worked with the Town of Union Bridge in an effort to comply with the National Pollutant Discharge Elimination System (NPDES) permit. Runoff diverted from cross culverts under George Street and Locust Street is conveyed to the facility—this facility treats runoff from approximately 12 acres of impervious surface.

Century Engineering, a Kleinfelder Company, was hired to design the facility. Because this facility is located directly adjacent to Little Pipe Creek, the facility type was chosen to be a constructed wetland. Mostly within the existing 100-year floodplain for Little Pipe Creek, the facility was entirely excavated. The design includes a four-foot deep pool located at the primary inflow point, a four-foot deep pool located at the outlet of the facility, and a shallow 18-inch deep low marsh connects the two deeper pools.

Besides the construction of the facility itself, this project included storm drain work to capture the runoff from the high frequency storms events, while diverting the larger storm events through the cross culverts. The elevations of each culvert's placement are determined by the runoff characteristics and specific design capacity for the facility. The construction of the facility and associated storm drain work was performed by Kibler Construction.

A key feature of the constructed wetland stormwater facility is also the native plantings through each hydrologic zone of the facility. Red maple, white oak, hackberry, American sycamore, and black locust were planted in the riparian zone, along with shrubs such as black chokeberry, witch hazel, and winterberry holly. The shoreline was planted with azaleas, dogwood, and buttonbush shrubs. The shallow water benches were planted with plugs of various native rushes, sedges, grasses and wildflowers, and the deep water pools were planted with pickerelweed, American bur-reed, arrow arum, and broadleaf arrowhead. The vegetative zones assist with the nutrient processing, further enhancing the water quality treatment provided by the facility.



Locust Wetland

Bureau of Resource Management (BRM) • 225 N. Center St., Westminster, MD 21157 • 410.386.2712
<https://www.carrollcountymd.gov/resourcemanagement/>

Protecting and managing Carroll County's natural resources for the pleasure and enjoyment of its Citizens

New NPDES Stations

By Rob Flora-Nakoski, Water Quality Specialist

The dawn of yet another newly issued NPDES MS4 permit is upon us. Along with the updated permit, the “NPDES stations”, as they are colloquially known by water resources staff, have been moved to a new location. For the past 20 years, these water monitoring stations have been located downstream of the Air Business Center wet detention pond just north of Westminster. A change in monitoring parameters with the new permit prompted a move to a different study watershed.

The *Assessment of Controls* portion of the MS4 permit includes water monitoring requirements regarding *BMP Effectiveness* to evaluate the effects of stormwater management strategies on local water quality. Biological, physical, and chemical monitoring is required at an “outfall” and “in-stream” station. Each spring, benthic macroinvertebrates are surveyed, and the stream habitat is assessed. Annually, a geomorphic stream assessment is conducted using surveyed cross-sections along the profile of the stream. Chemical monitoring occurs separately at each station. Some parameters are measured continuously, such as temperature, pH, conductivity, and flow while other parameters are measured instantaneously, such as suspended solids, bacteria, chloride, biological oxygen demand, ortho-phosphate, total phosphorous, nitrate/nitrite, ammonia, and total nitrogen.

Each year, 4 baseflow grab samples are taken at each station for the parameters above. Eight storms are also sampled during the year using automated samplers to collect time-weighted discrete samples, which are then composited for each hydrograph limb (ascending, peak, descending) by flow weight. This allows the calculation of an Event Mean Concentration (EMC) for each limb of a storm event so that total loading can be calculated for each parameter.

The new “outfall” station is located at the outfall for the Roberts Field wet pond in Hampstead Valley. This station has a 51-acre drainage area, 21 of which are impervious. The new “in-stream” station is located just under one-half mile downstream, next to the Hampstead Wastewater Treatment Plant. This station has a 334-acre drainage area, 92 of which are impervious. An equipment box at each station contains a bubbler flow meter to measure continuous water level and flow. Each station also has an automated sampler for collecting samples throughout the duration of storm events. To continuously measure *in-situ* temperature, pH, and conductivity, a multiparameter sonde will be deployed approximately 200 feet upstream from the “in-stream” station. During the sampling period at these stations, various retrofits or new facilities will be constructed and changes in water quality/quantity will be assessed.



Outfall Station



In-stream Station



*Automated Sampler and
Bubbler Flow Meter*

Carroll County Environmental Symposium

By Kelly Martin, Watershed Grants Technician

The Department of Land & Resource Management held Carroll County's first annual Environmental Symposium on Saturday, November 12 from 9:00 – 12:00 in Room K-100 Carroll Community College.

Sixteen exhibitors including: 4-H G.O.E.S., Friends of Liberty Reservoir, Alliance for the Chesapeake Bay, Charlotte's Quest, and the University of Maryland Extension Master Gardener Program shared information about their organizations and ways to protect our natural resources while recruiting volunteers to assist in implementing their missions.

A recycled art contest for high school students was the highlight of the Symposium. Twenty-six high school students crafted works of art from recycled materials. Over 150 Symposium attendees voted for their favorite creation.

Nora Bjerkaas, Century High School, won first place; second place went to Hayley Boore from South Carroll; and third place went to Joshua Myrick-Whittaker from Century.

Special thanks to all of the exhibitors and students that participated.



RECYCLED ART CONTEST WINNERS



Nora Bjerkaas
Century High School



Hayley Boore
South Carroll High School



Joshua Myrick-Whittaker
Century High School





Seeking Nominations!

Accepting nominations for 2023 Environmental Action Awards, starting Earth Day, April 22. Check the website in March for more details.

<https://www.carrollcountymd.gov/government/boards-commissions/environmental-advisory-council/environmental-action-awards/>

Follow us on Facebook at [Carroll Environment](#)





**Carroll County Recycling Operations will be holding a
Compost bin & Rain barrel
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Pre-order deadline: April 3, 2023

Orders will only be taken online. Accept debit card and credit cards

Orders must be picked up on

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Carroll County Government
225 N. Center Street, Westminster, MD 21157

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- Elevated spigot accommodates watering cans
- Insect resistant stainless steel filter

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at **410-386-2510** or visit www.envioworld.us/carrollcountymd
For more information on the products offered, visit www.envioworld.us

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- Elevated spigot accommodates watering cans
- Insect resistant stainless steel filter

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- Lower your water bill
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- Reduce your waste

Compost Bin

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- Go chemical & fertilizer free
- Improve and enrich your soil and gardens, lawns, trees, shrubs & houseplants
- Help plants resist disease
- Help your household and municipality save on collection and disposal

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Meet the Staff

**Sarah Kowalski
Office Associate**

Sarah grew up in Berks County, PA, before moving with her family to Manchester after high school. Here, she received her Associate's degree in Anthropology and Sociology from Carroll Community College. She previously worked at St. Timothy's School in Pikesville as an administrative assistant for 2 years and then as a mortgage loan processor in Reisterstown for 2.5 years. She is currently pursuing her Bachelor's of Science in Environmental Science from Oregon State University. Sarah and her husband love visiting National Parks and most recently visited Rocky Mountain National Park in Colorado and Glacier National Park in Montana. In her free time, she enjoys painting, reading, and gardening.



Sydney Barrett

Sydney is in her senior year at McDaniel College and is majoring in Environmental Studies with a minor in Biology. She graduated in 2019 from Annapolis High School and lives in Annapolis, Maryland. This is her first year interning for the Land and Resource Management Department. She plans to graduate in Spring, 2023 and pursue a career helping the environment. In her free time she enjoys, hiking, exercising, and spending time with family.

