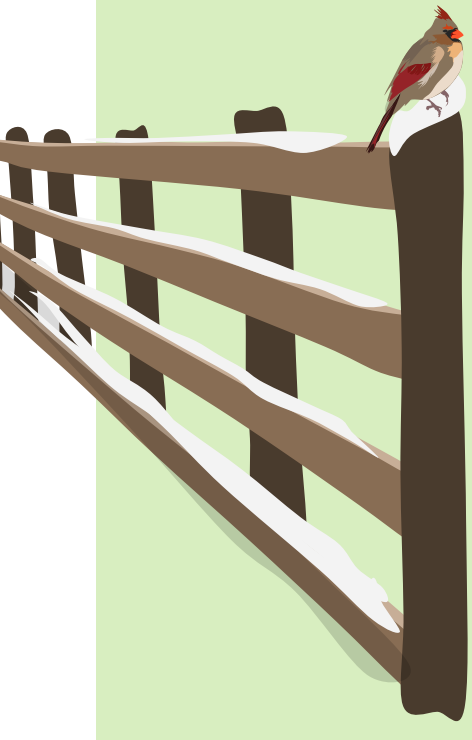
down to earth

Environmental Restoration Quarterly • Winter 2017



Free Stormwater Pollution Prevention Workshop For Homeowners

By Brenda Dinne, Special Projects Coordinator

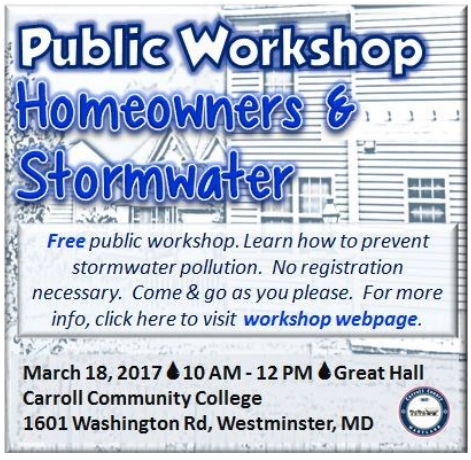
The Carroll County Environmental Advisory Council (EAC) is partnering with the Carroll County Water Resource Coordination Council to host a free public workshop on March 18, 2017, in the Great Hall at Carroll Community College, to provide homeowners with information on how to prevent stormwater pollution and minimize stormwater runoff from their properties.

Experts will be available to provide helpful materials and answers to individual questions on the topics listed below. Each expert will briefly present on a topic (see webpage for approximate times).

- General Homeowner Best Management Practices
- Lawn Care and Landscape Management
- Septic Maintenance
- Permeable Pavement
- Rain Gardens
- Composting (Yard and Food Waste)
- Reduce, Reuse, Recycle!
- Tree Planting
- Stream Corridor Assessments & Stream Buffer Initiative

Come for the entire time or just drop-in for specific sessions and talk directly to the expert(s).

More details and information on the Homeowners & Stormwater Workshop can be found on the website at http://ccgovernment.carr.org/ccg/npdes/homeowners/ or by contacting Brenda Dinne @ bdinne@ccg.carr.org or 410-386-2140. No registration is necessary. The workshop will be held in the Great Hall from 10:00 AM to 12:00 PM. ●



Department Land and Resource Management (DLRM) • Bureau of Resource Management (BRM)
225 N. Center St., Westminster, MD 21157 • 410.386.2506 • ccgovernment.carr.org/ccg/resmgmt

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

Stormwater Retrofit and Grant-Funded Monitoring

By Byron Madigan, BRM Staff

Retrofit Monitoring Program

The County's current monitoring strategy is focused primarily around retrofit locations where reductions in loadings can be documented from a before and after study approach. This comprehensive monitoring program is intended to validate the overall effectiveness of stormwater Best Management Practices (BMPs) and document the efficiency of innovations made to BMPs.

Monitoring is done bi-weekly by sampling and measuring sediment, nitrogen, and phosphorus. Additional monitoring also includes the collection of spring macro-invertebrates, which documents changes in biological health pre and post implementation.

The Bureau of Resource Management currently monitors five locations throughout the County where stormwater retrofits are planned. Once construction to retrofit the existing facility is underway, monitoring will temporarily be suspended. Following the as-built approval of the new facility, chemical and biological data collection will continue to document changes in stream health.

Innovative/Alternative Enhanced Nutrient Removal

The purpose of the monitoring project is to evaluate the pollutant removal efficiency of an enhanced sand filter design developed by Carroll County to improve the removal of nutrients from stormwater runoff. The enhanced sand filter design includes an iron (Fe) additive to increase the removal of dissolved phosphorus, and therefore total phosphorus from stormwater runoff. It is expected that the iron-enhanced filter will remove 85%-90% of phosphates from stormwater as it passes through the filter.

A monitoring plan for this project was developed by the Center for Watershed Protection (CWP) and was based on Maryland Department of the Environment's (MDE) innovative/alternative Best Management Practice (BMP) monitoring requirements.

The before and after study design for this project will measure changes in influent and effluent concentrations from a conventional sand filter, and then the enhanced filter with the incorporated iron.

All sampling will be done by County staff through the use of automated sampling equipment to determine how much more effective the enhanced filter performs as compared to the conventional sand filter.

The results of the study will provide support to adopt the enhanced sand filter design as an approved BMP by the Maryland Department of Environment (MDE) and Chesapeake Bay Program. Funding for this project was received through a National Fish and Wildlife Foundation (NFWF) research grant.

Streambank Regeneration through Upland Hydrologic Restoration

Increasing impervious cover within urbanizing watersheds reduces groundwater infiltration and causes accelerated runoff to our streams. The increased discharge volume and velocity to the receiving channel, accelerates stream bank erosion, resulting in greater sediment and nutrients within the stream.

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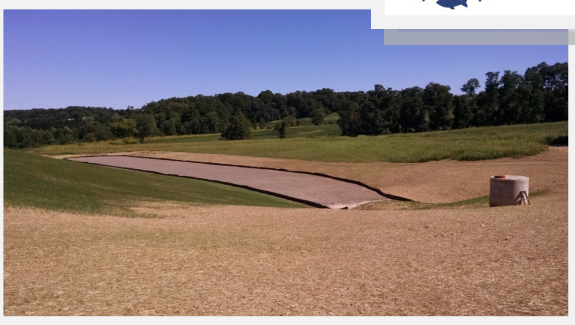
Whispering Valley retrofit

The on-site Carroll County Maintenance Center monitoring equipment



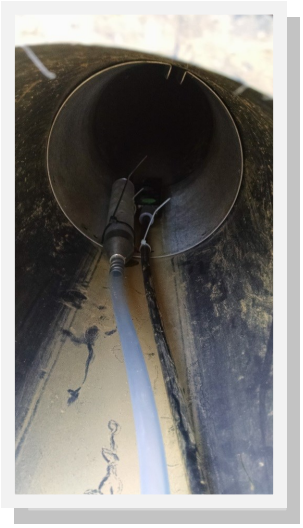
The Carroll County Maintenance Center project

The Carroll County Farm Museum monitoring site

Carroll County Maintenance Center outfall

Shannon Run stream banks

2" x 6' PVC with pressure transducer for stage height analysis



Outfall equipment and tubing that collects water.

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A research grant was awarded to Carroll County from the Chesapeake Bay Trust's (CBT) Restoration Research Grant Program to evaluate the effectiveness of upland Best Management Practice (BMP) implementation on stream channel stability.

The purpose of this monitoring project is to evaluate and document the effectiveness of stormwater retrofits on the changes in downstream stream channels. The implementation of properly sized BMPs that exceed Maryland Department of Environment (MDE) performance standards for stream channel protection will lead to self-recovery of the channel.

Restoration of the upland runoff through the implementation of properly sized BMPs will result in subsequent reductions in storm flow and ultimately nutrient and sediment loads.

Stream channel monitoring for this project will be performed by the Center for Watershed Protection (CWP), and will include; monumented cross sections, stream bank pins, and stage height analysis. These monitoring parameters will allow for the quantification of sediment loss pre-retrofit and then determine the prevented sediment post-retrofit.

The results of the study will provide recommendations related to the nutrient and sediment credits for the Chesapeake Bay Total Maximum Daily Load (TMDL) as part of the requirements for the County's National Pollutant Discharge Elimination Systems (NPDES) permit. ●

CBTRUST
Chesapeake Bay Trust

CENTER FOR WATERSHED PROTECTION

The Carroll County Maintenance Center Facility under construction

Iron-Enhanced Sand Filter to Accelerate Phosphorous Removal in Stormwater

By Janet O'Meara, BRM Staff

The Bureau of Resource Management (BRM) has been working to meet the goals set forth by the National Pollution Discharge Elimination System (NPDES) Permit and Total Maximum Daily Load (TMDL) requirements associated with the Chesapeake Bay by performing stormwater retrofits. The BRM staff identified the stormwater management facility located at the Carroll County Maintenance Center as a prime opportunity to retrofit an existing facility and treat additional currently untreated impervious. The original facility was built in 1983 primarily for flood control without water quality measures. The newly constructed facility treats 45.49 acres of drainage area, 13.03 of which are impervious. The facility was designed to utilize the county's standard sand filter design initially, and will be converted to the County's iron-enhanced sand filter design which will be implemented in the next two years. The facility will be monitored continuously to show the efficiency for both media types. Based on preliminary studies, the enhanced sand filter is expected to yield greater than 80 percent removal of total phosphorous concentrations in the stormwater discharged to the local stream.

The BRM worked closely with the Department of Public Works, Bureaus of Facilities, Roads and Fleet on the retrofit design for the facility and new storm drain system.

This project was awarded partial construction funding through the Maryland Department of Natural Resources' Chesapeake and Atlantic Coastal Bays Trust Fund in 2014, and additional funding through the National Fish and Wildlife Foundation in 2015. White Pine Construction began the retrofit of the facility in the Spring of 2016, construction of the facility wrapped up in September. The construction of the storm drain system through the Maintenance Center alley ways quickly followed and was completed in October of 2016 by Conewago Enterprises, Inc. The implementation of this facility will assist in the study of an innovative nutrient removal technique and meet requirements to treat impervious surfaces as set forth by the National Pollutant Discharge Elimination System (NPDES) permit. ●

MARYLAND DEPARTMENT OF NATURAL RESOURCES

Preparation for Envirothon

By: Colleen Ensor, BRM Staff

Liberty High School students learn about soil.

Each year the Carroll Soil Conservation District hosts and sponsors the Carroll Envirothon for local high school students who have a passion for science and the environment. On November 29th, students participated in the instructional portion of the two-part event.

Throughout the day, the students were encouraged to explore and test their knowledge in the subjects of aquatics, forestry, soils, wildlife, and invasive species by participating in activities and testing in each of these five areas. Tracy Eberhard, Bureau of Resource Management Water Resource Specialist, served as the station representative for aquatics.

The participating schools this year included Century, Francis Scott Key, Liberty, Manchester Valley, North Carroll, South Carroll, and Winters Mill high schools, as well as the Venturing Crew 202.

Then, on Wednesday, April 20th, the young people returned to Bear Branch Nature Center for testing and presentations. This educational event is supported by local organizations including the BRM. ●

THE MARYLAND ENVIROTHON

MARYLAND ASSOCIATION OF SOIL CONSERVATION DISTRICTS, INC.