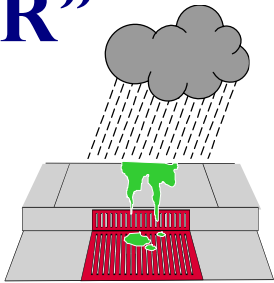


ORANGE “STORMWATER”



Protecting Orange County's Water Quality
Through Effective Stormwater Management



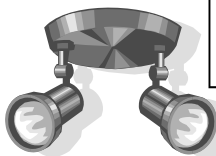
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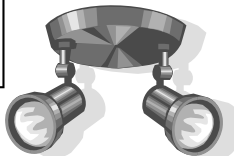
Spring 2011

LAYOUT/DTP:
Kris Breitenfeld



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PROJECT SPOTLIGHT



CONSERVATION DISTRICT'S GREEN INFRASTRUCTURE WEBPAGE

GREEN INFRASTRUCTURE WEBPAGE

The Soil and Water District would like to introduce our new Green Infrastructure webpage:

Go to www.ocsoil.org and then click on “Green Infrastructure in Orange County”

Green is one of the more popular buzz words these days. Being Green means different things to different people, but usually gets back to sustainability and reducing our negative impacts on the environment. When applied to storm water runoff, GREEN often means using practices on new developments that ‘mimic the pre-development hydrology’ (another popular buzz phrase amongst storm water managers). In lay terms, this means practices that tend to allow for the same amount of groundwater recharge as was occurring before development. Historically, storm water designers paid little attention to this concern. Runoff from newly created impervious surfaces was moved to pipes or other storm water conveyances as quickly as possible, with a resulting decrease in groundwater recharge. Even with the more recent innovation of end-of-pipe storm water treatment ponds which help to address flooding and water quality concerns, diminished groundwater recharge remains a large concern.

Very recent changes in New York State storm water laws now require developers to address not only flooding and water quality concerns, but also changes to the natural hydrology. Developing in this fashion ideally includes the use of a whole host of Green Infrastructure (GI) practices and principles.



Middletown Campus-Cornell Cooperative Extension

It is also important to remember that these same concepts can often be employed in existing urban settings. Since older developed areas usually have little or nothing in the way of storm water management, ‘retrofitting’ storm water management practices in these areas can offer significant water quality and groundwater recharge benefits, while also providing an opportunity to demonstrate modern Storm Water Management (SWM) practices. This demonstration value is crucial to accelerating the adoption of GI practices in the private sector and on new development in general.

In Orange County where more than half of our population relies on groundwater sources as their water supply, the importance of promoting practices that maintain groundwater recharge is obvious. These practices also help to maintain stream base flows. In addition, we have many water bodies that have been impacted by the pollutants contained in urban runoff. Using GI practices both on new development and in existing urban areas holds the potential to protect and improve the quality of Orange County’s water resources.

This webpage is intended to highlight GI practices that have been installed in Orange County. By showing practices that were designed, installed and are functioning in our local setting, we hope this site will help with accelerating the adoption of GI practices as mentioned above.



Orange County Land Trust's Hunter Farm Preserve

Initially, the site will focus on practices, primarily Rain Gardens, planned, designed and installed with assistance from OCSWCD. However, several GI practices designed and installed by others will be included in the initial site postings. Our intention is to continue to expand this site with as many appropriate local GI practice examples as possible. Therefore, storm water designers and managers are strongly encouraged to submit their GI practice examples to help make this site as useful as possible in promoting more widespread adoption of Green Infrastructure development principles.



SUNY Orange - Middletown Campus

NOTE: For more information on the projects pictured here, visit our “Green Infrastructure” Web-page.

MS4 PROGRAMS IN ORANGE COUNTY AUDITS—Some Positives and Some “Room for Improvements”

**Natalie Browne, Environmental Program Specialist
NYS DEC**

It has been over three years since the MS-4 program had to be fully implemented. There is still a wide range in the level of program implementation among municipalities in Orange County. The DEC has been performing audits of regulated MS-4 communities since January 2008. DEC has audited most of the traditional MS-4s in Orange County and we've audited one non-traditional MS-4, the United States Military Academy at West Point. There are currently six traditional MS-4s in the county that have not been audited. It is expected that all audits in the region will be completed by March 31, 2012. If you have not had a visit from DEC staff, you can expect to hear from us soon. Although all SPDES permits provide for DEC access to records at any time, a letter notifying the MS-4 of the audit is usually mailed to the permittee three weeks before the audit.

The Orange County Soil and Water Conservation District has done a great job of implementing the education and outreach grant on behalf of participating communities. That grant has come to an end so it is time for MS-4 communities to make sure you are implementing an education and outreach program. Information in town hall alone is not a sufficient program. Another common deficiency we've seen is that MS-4s are performing education and outreach activities, but not tracking what work is done. If you don't keep track of how many citizens attend events, how many brochures are taken or how many people check the website, DEC has no way of knowing what you did for your education and outreach program. This is true for **Minimum Measures One and Two**. Save all your records for the annual report and the audit. Remember, you don't have to re-invent the wheel. If other organizations within the municipality provide education or outreach, you can take credit. But, you must have documentation!

All the MS-4s in Orange County that have been audited have an outfall map. This is a positive since the map is the basis for the MS-4's Illicit Discharge Detection and Elimination program, **Minimum Measure Three**. One round of dry weather surveys of outfalls must be completed by 2013. Most MS-4s in Orange County have started the surveys; some have even finished! Be sure to properly document the surveys.



There should be public education materials that relate to illicit discharge and explain what an illicit discharge is. All of these materials should have the name of the person to call if an illicit discharge is found. The municipal web-site is a great place for this information.

Minimum Measure Four, Construction Site Erosion and Sediment Control, is where Orange County MS-4s shine. Orange County is the fastest growing county in the state so it is very important that Orange County communities have good programs for inspecting construction sites. Not all MS-4s have a standardized inspection form; DEC recommends this. These should be kept

in a central location. Even if construction is slow now in your MS-4, you'll have a program in place for the time when the housing market recovers.

Not all MS-4s have a program for Post-Construction Stormwater Runoff, **Minimum Measure Five**; this is a permit requirement. MS-4s must maintain publicly owned practices and ensure maintenance is performed at privately owned practices. Document. Document. Document.

Implementation of **Minimum Measure Six** has varied a lot among Orange County MS-4s. If maintenance that is performed is not documented, then the DEC must assume that maintenance is not being performed. During the audit, we look at the Best Practices Manual for the main village facilities (usually only the DPW garage). DPW staff should be trained in the best practices manual and should receive general stormwater training.

All regulated MS-4s are required, by GP-0-10-001, to maintain a Stormwater Management Plan. It must contain detailed procedures for each Minimum Measure. It is a living document that should be updated periodically.

Please call DEC staff at 914-428-2505 Ext. 354 if you have questions about implementation of the MS-4 program. We are happy to answer questions.



MORE GREENWOOD LAKE "GI" PROJECTS

*Karen Emmerich, AICP, PP
Lehman & Getz Engineering, P.C.*

RIPARIAN BUFFER ON GREENWOOD LAKE'S SHORE



Coir log installation



Buffer after planting



Coir log and plantings



Coir log with well established wetland plants beyond it and blueberry and summersweet on the shoreline

GREEN INFRASTRUCTURE RETROFIT PROJECT FROM PARKING LOT TO PARK

Lehman and Getz prepared a plan to create a park from a former asphalt parking area that was located in the DEC wetlands buffer area. They had to get a wetlands permit (6 months), but then the Village used its DPW

crew to remove the asphalt, place sod and plant trees. It's really nice, and a HUGE improvement over what was there before. This is a great example of what can be done with limited funds, donations, and a grant (which was used to buy the playground equipment). It's attractive and functional, and from a stormwater perspective, much better than what was there.

BEFORE



AFTER



Now the citizens have a beautiful park to enjoy, the parking lot's impervious surfaces are gone so runoff has been reduced and the park helps to protect the nearby wetland buffer area. And it sure looks great!

The following is an article that appeared in the Orange County Land Trust's e-newsletter and is a brief look into the work being done in our County to get more Conservation Advisory Councils (CAC) organized. An informational brochure has been developed explaining what a CAC is and some highlights of the work being done by existing CAC's. If you would like a copy, want more information or have questions, please contact one of the people listed in the following article.

JOIN A CONSERVATION ADVISORY COUNCIL IN YOUR COMMUNITY

*Karin Roux, Director of Conservation and Stewardship
Orange County Land Trust*

The Orange County Land Trust, OC Department of Planning and OC Soil and Water Conservation District are working together to promote the formation of new Conservation Advisory Councils for several of our communities. CAC's currently work in eight Towns and Villages in Orange County. These advisory groups are comprised of town and village residents, appointed by the Town or Village Board, who provide expert conservation advice and information to their board members and elected officials, and also undertake a wide range of projects that help protect and preserve local natural resources. These may include stream-walk assessments (Town of Monroe CAC), farmland protection programs (Walkill CCE), community gardens and riverside or riparian plantings. If you want to get involved in local conservation efforts and are a resident of any of the following towns in Orange County: Chester, Crawford, Deepark, Greenville, Hamptonburgh, Highlands, Minisink, Mt. Hope, Newburgh, New Windsor, Tuxedo, Wawayanda or Woodbury, contact Karin Roux, OCLT Director of Conservation and Stewardship at karin@oclt.org, Kevin Sumner at kevin.sumner@ocsoil.org or Kate Schmidt at kschmidt@orangecountygov.com. For more information on Conservation Advisory Councils in NYS visit <http://www.nysaccny.org/>.



The Hudson Valley Regional Council is working with a number of partners to implement a grant-funded watershed planning project focusing on developing conceptual green infrastructure plans for sites in the region. I described the overall approach for this project in the July 2010 newsletter (http://www.ocsoil.org/pdf/Stormwater_Newsletter_2010.pdf) including the focus on working with community leaders and citizens to identify promising sites and develop green in-

frastructure plans. Here I'll discuss one set of key challenges and trends that are drawing attention to green infrastructure in the US and our region.

In five of the seven places we are working – the cities of Newburgh, Beacon, Kingston, Poughkeepsie, and Yonkers – one of the most pressing problems facing municipalities and taxpayers is the need to upgrade aging wastewater systems. Many of the older sewer systems in our region's cities and villages have cracks and leaks that allow rainwater to enter the system. Many of these cities, moreover, are served by combined systems designed to carry both wastewater and stormwater runoff. In wet weather, these systems often receive more water than they are able to handle effectively, leading to overflows and discharges of sewage that is not adequately treated. This creates obvious public health concerns, in addition to impacting environmental quality and causing objectionable odors and other problems. In addition to overflows at the treatment plant, these problems also occur in neighborhoods where raw sewage overflows into streets or other locations.

Certain cities that are formally designated as combined sewer overflows, or CSOs, are dealing with challenging regulatory requirements for separating their storm and sanitary sewer systems or taking other measures to reduce overflows to acceptable levels according to the regulations. Many other places, including villages and other areas that already have separate storm and sanitary systems, have the same basic problem: pipes, pump stations and treatment plants are overwhelmed by too much water during wet weather. This is often due to "infiltration and inflow," the engineers' term for water getting in through cracks in sewers, manhole covers, connections of sump pumps and downspouts, etc. Overflows from separated sanitary systems are known as sanitary sewer overflows, or SSOs.

Conventional fixes for wastewater overflows include engineering projects, some of which focus on capturing and storing water during wet weather, such as huge underground storage tunnels costing many millions of dollars. CSO communities also look for opportunities and funding to install separate storm sewers, often doing this incrementally for individual streets or neighborhoods when other road or utility projects are implemented. The capital cost of these projects is a huge obstacle, and when the excess water ends up being processed in a treatment plant there are energy and other costs involved in ongoing operations. Yet in recent years it's become clear that there is a different approach that may be less costly and yield broader benefits to the community: green infrastructure. New York, Syracuse, and Philadelphia are three places in our region where municipal leaders have recently made major commitments to green infrastructure as a significant component of their strategy for remediation of CSOs. Conventional engineering upgrades are typically also part of the overall plan, but more and more people are getting interested in maximizing the opportunity to use green infrastructure wherever possible, due in part to its multiple benefits. This approach relies primarily on using a wide variety of management practices to slow stormwater down, spread it out, and allow it to soak into the ground or evaporate locally, onsite or close to the source.

Think about it: the water resources management challenges due to CSOs and SSOs can, theoretically, be addressed using an approach relying almost completely on building new pipes, storage chambers, and other upgrades to sewer systems, which solves certain problems. An approach that uses more green infrastructure, however, potentially provides a much broader range of benefits to the community. Increased property values, recreational opportunities, air quality, energy savings, and job opportunities are some examples. A study of economic benefits estimated that Philadelphia's green infrastructure plan, for example, can produce \$2.7 billion in additional benefits to the community over the next 40 years as compared to an approach using only conventional system upgrades. The largest single benefit, according to this study, emerges from the cooling effect of trees, green space, green roofs, and other design elements that include vegetation in urban areas: the resulting reduction in heat stress mortality is valued at more than \$1 billion. Strictly from a water quality perspective, investing in green infrastructure to reduce wastewater overflows also addresses non-point source pollution concerns by filtering stormwater onsite. The Philadelphia economic benefit analysis is available at http://www.phillywatersheds.org/ltcpu/Vol02_TBL.pdf

I expect that many people reading this are not located in cities, and the question naturally arises, what's in it for me? How does all this relate to smaller towns and villages in the Hudson Valley? First of all, as noted above, many smaller villages and other sewered areas are facing the same set of problems. As the region grows in the next 10-20 years, green infrastructure plans and designs for existing centers can potentially provide a more cost-effective approach to support economic vitality and quality of life. More broadly, as it becomes ever more apparent that we need to focus new development, for many reasons, in compact centers (including existing cities and villages) and implement other aspects of the smart growth paradigm, we all have a direct interest in looking for ways to support the economic and environmental health of our urban centers.

For new development areas, the NYS DEC's recently-revised construction permit and stormwater design manual establish the state's the regulatory and design framework for implementing green infrastructure to manage stormwater. Local officials, planners, developers and engineers in these areas are facing significant

challenges as they begin operating under the new regulations, and DEC staff are working to respond to questions raised in recent workshops and conferences. Yet, despite all the unknowns -- for example, who will be responsible for ensuring that multiple, small practices, like rain gardens, will be maintained over time, especially on private property? -- in some ways, implementing green infrastructure in lower density areas should be simpler than in cities and village centers. A key reason is the availability of more land for practices to manage stormwater. One key lesson of the regional planning project is that, even while the need for GI is especially pressing in more populated areas, the challenge of finding much available space for retrofits is significant. Other issues are shared by all communities, particularly tight budgets, limited staff, and the challenge of providing training and other resources needed by municipalities to begin implementing and maintaining green infrastructure projects. At the same time, in challenge there is opportunity, and there are early signs that these trends are helping to drive new business activity and jobs. The Hudson Valley region can potentially become a leader in implementing green infrastructure to restore water quality as part of an overall strategy for economic revitalization.

This article was written by Simon Gruber, Hudson Valley Regional Council.
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This project has been funded by the American Recovery and Reinvestment Act with support from the New York State Department of Environmental Conservation and New York State Economic Recovery and Reinvestment Cabinet. For more information, please visit: www.recovery.gov, www.dec.ny.gov or www.recovery.ny.gov.



A corkboard with a yellow sticky note pinned to it. The sticky note has the word "REMINDER" written on it in blue. Below the sticky note, there are two blue boxes with white text. The first box says: "This is one way that MS4s can meet the Public Outreach (MM #1) component of the program." The second box says: "The District's Stormwater Education Display is available for use at public events, meetings, etc. Contact us for more information or if you'd like to reserve it for an upcoming event."

A red-bordered box with a black border. Inside, the text reads: "4 HOUR DEC EROSION AND SEDIMENT CONTROL TRAINING". Below this, it says: "Just a reminder that the training is good for 3 years and then you must re-take the workshop. Your wallet card has the date of your last course. Check out DEC's website for upcoming workshops." At the bottom, the URL www.dec.ny.gov/chemical/8699.html is displayed in red.