



Information, News and Highlights of Kane County's NPDES Phase II

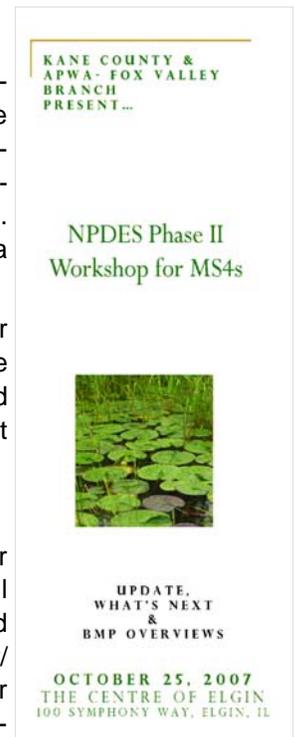
2007 was the fifth and final year of the first stormwater management permit under the EPA's National Pollutant Discharge Elimination System (NPDES) Phase II program. The Environmental Management Department played a leadership role in assisting all impacted Kane County communities to meet the requirements of the NPDES Phase II program.

The NPDES Phase II program requires impacted communities to meet six minimum control measures to improve or maintain water quality in Illinois' streams and rivers. Following is information on each of the six Phase II categories.

Public Education & Outreach/ Public Involvement & Participation

Kane County has strived to provide educational and public involvement tools that municipalities can use to meet the two Public Education & Involvement categories. Some of the more prominent tools that have been consistently utilized for Stormwater and Environmental information include the annual distribution of the *Kane County Recycles* publication to the residents in Kane County, as well as the very successful Kane County Stream Sign campaign. The public has been involved through stream cleanups, hazardous waste collections, and a stream monitoring program.

In 2007, Kane County held its first NPDES Phase II workshop for MS4s. Over 75 stormwater managers attended from Kane County and neighboring communities. The workshop was the first in what is hoped to be an annual event, giving Kane MS4s a venue for sharing ideas and problem solving. The presentations from the 2007 NPDES Phase II Workshop are available at <http://www.co.kane.il.us/kcstorm/npdes.asp>.



In 2008, a new Kane County Stormwater Education website will be introduced. It will be the first of its kind in Kane County, and seeks to pull together the best stormwater/ water quality educational resources for adults, children, educators, and public officials. Look for the website in early 2008!

In other stormwater educational news, Kane County will be distributing two brochures in early 2008; one for the general public and one for Kane County riparian landowners. The brochures will be one more tool that Kane County and other Kane MS4 communities can use to educate the public and improve the water quality in our stormwater systems. Kane MS4 communities will also be offered storm drain stencil kits to use or make available to local environmental groups.

Kane County Stormwater Speakers' Bureau

Looking for a speaker for your next municipal function? Need someone who can review the basics of stormwater programs or push the envelope of available BMPs or techniques? Check the new Kane County Stormwater Education Website for speakers who are available to come present at your next function. Contact Karen Kosky at 630-208-8665/ koskykaren@co.kane.il.us for more information!

Corner

Program for Managers of Municipal Separate Storm Sewer Systems (MS4s)

Construction Site Runoff Control and Post-Construction Runoff Control

Kane's countywide stormwater management ordinance meets these two construction-related NPDES Phase II minimum control measures. Kane County's Stormwater Management Ordinance went into effect on January 1, 2002 and certified communities were audited in 2003. An amendment is expected to be passed in 2008, and Kane County certified communities will be informed of that required change. These changes are required by FEMA to better comply with the National Flood Insurance Program (NFIP) and the Community Rating System (CRS). The CRS is a program which will allow Kane County residents to receive discounts on their flood insurance rates.

Illicit Discharge Detection & Elimination/ Pollution Prevention/ Good Housekeeping For Municipal Operations

These two categories of control measures are implemented separately by each local unit of government. Kane County has worked over the last five years on a number of fronts to implement internal measures to improve the quality of stormwater runoff from its County facilities.

What's Next?

2008 brings with it the official end of the first five-year NPDES Phase II permit cycle and the beginning of a new one. At the October 25, 2007 NPDES Phase II workshop, Terri LeMasters and Al Keller from the Illinois Environmental Protection Agency outlined the following "to-dos" for all Illinois MS4s during this transition period:

As soon as possible (official due date: September 1, 2007):

New Notices of Intent are due to IEPA

- Best Management Practices (BMPs) and measurable goals for the six minimum control measures must be included – Any new BMPs for 2008-2013?
- Timetable for implementation for any new or revised BMPs
- Person or persons responsible for implementation – Has this changed?
- Identify your own program and any partnering programs

By February 28, 2008:

All 2003 NOI activities should be complete

By June 1, 2008:

Final report for 2003-2008 NPDES Phase II permit is due to IEPA

Need Help?

If you need help with any of the above activities, check out the following Kane County and IEPA resources:

- IEPA NPDES Phase II Information: <http://www.epa.state.il.us/water/permits/storm-water/ms4.html>
(includes blank NOI and Annual Report forms)
- Kane County NPDES Phase II Information: <http://www.co.kane.il.us/kcstorm/npdes.asp>
(includes completed forms specific to Kane MS4s and information from NPDES Phase II events)
- Contact Karen Kosky, Watershed Engineer, Kane County Environmental Management Department
Phone: (630) 208-8665 Email: koskykaren@co.kane.il.us



New NPDES Phase II Resource Fact Sheets

As a service to Kane County MS4s and other stormwater managers, following is the first in a series of occasional "Stormwater Fact Sheets". This information can be shared with staff, committee or commission members, and future fact sheets may be appropriate for distribution to the general public through your municipal or township newsletter! Following is an article from the Center for Watershed Protection's *Stormwater Manager's Resource Center*.

Stormwater Manager's Resource Center (SMRC) Website www.stormwatercenter.net
Center for Watershed Protection, Inc.
2000; Ellicott City, MD

Aquatic Buffers Fact Sheet: Buffer Zones

An aquatic buffer is an area along a shoreline, wetland, or stream where development is restricted or prohibited. The primary function of aquatic buffers is to physically protect and separate a stream, lake or wetland from future disturbance or encroachment. If properly designed, buffers can provide stormwater management and act as a right-of-way during floods, sustaining the integrity of stream ecosystems and habitats. Technically aquatic buffers are one type of conservation area, function as an integral part of the aquatic ecosystem, and can also function as part of an urban forest.

The three types of buffers are water pollution hazard setbacks, vegetated buffers, and engineered buffers. Water pollution hazard setbacks are areas that may create a potential pollution hazard to the waterway. By providing setbacks from these areas in the form of a buffer, potential pollution can be avoided. Vegetated buffers are any number of natural areas that exist to divide land uses or provide landscape relief. Engineered buffers are areas specifically designed to treat stormwater before it enters into a stream, shore or wetland.

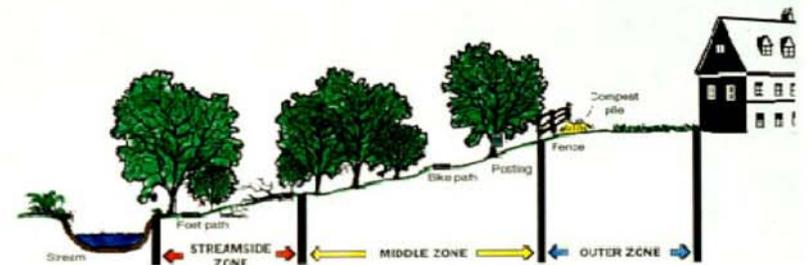
Technique

An effective stream buffer design should be based on 10 practical performance criteria that govern how a buffer will be sized, delineated, managed, and crossed (for more information see *The Architecture of Urban Stream Buffers, Article 39 in The Practice of Watershed Protection*).

- Minimum total buffer width
- Three zone buffer system
- Mature forest as a vegetative target
- Conditions for buffer expansion or contraction
- Physical delineation requirements
- Conditions where buffer can be crossed
- Integrating stormwater and stormwater management within the buffer
- Buffer limit review
- Buffer education, inspection and enforcement
- Buffer flexibility

In general, a minimum base width of at least 100 feet is recommended to provide adequate stream protection. The three zone buffer system is an effective technique for establishing a buffer, consisting of an inner, middle, and outer zones. The zones are distinguished by function, width, vegetative target, and allowable uses. Figure 1 shows the three zones and each of their characteristics.

The three-zone urban stream buffer system



CHARACTERISTICS	STREAMSIDE ZONE	MIDDLE ZONE	OUTER ZONE
FUNCTION	Protect the physical integrity of the stream ecosystem	Provide distance between upland development and streamside zone	Prevent encroachment and filter backyard runoff
WIDTH	Min. 25 feet, plus wetlands and critical habitats	50 to 100 feet depending on stream order, slope, and 100 year floodplain	25 foot minimum setback to structures
VEGETATIVE TARGET	Undisturbed mature forest. Reforest if grass	Managed forest, some clearing allowable	Forest encouraged, but usually turfgrass
ALLOWABLE USES	Very Restricted e.g., flood control, utility rty. of ways, footpaths, etc.	Restricted e.g., some recreational uses, some stormwater BMPs, bike paths, tree removal by permit	Unrestricted e.g., residential uses including lawns, gardens, compost, yard wastes, most stormwater BMPs

For optimal stormwater treatment, the following buffer designs are recommended. The buffer should be composed of three lateral zones: a stormwater depression area that leads to a grass filter strip that in turn leads to a forested buffer. The stormwater depression is designed to capture and store stormwater during smaller storm events, and bypass larger stormflows directly into a channel. The captured runoff within the stormwater depression can then be spread across a grass filter designed for sheetflow conditions for the water quality storm. The grass filter then discharges into a wider forest buffer designed to have zero discharge of surface runoff to the stream (i.e, full infiltration of sheetflow).

Impediments

There are several perceived impediments associated with the implementation of a buffer program, that may include:

- Potential loss of developable land
- Private landowners may be required to provide public access to privately held stream buffers
- Excessive nuisance species will be present due to the natural buffer area
- Buffer programs will place additional demand on scarce local government resources

Maintenance Considerations

An effective buffer management plan should include establishment, management and distinctions of allowable and unallowable uses in the buffer zones. Buffer boundaries should be well defined and visible before, during and after construction. Without clear signs or markers defining the buffer, boundaries become invisible to local governments, contractors, and residents (see *Invisibility of Stream and Wetland Buffers in the Field, Article 41 in The Practice of Watershed Protection*). Buffers designed to capture stormwater runoff from urban areas will require more maintenance if the first zone is designated as a bioretention or other engineered depression area.

Effectiveness

The pollutant removal effectiveness of buffers depends on the design of the buffer and while water pollution hazard setbacks are designed to prevent possible contamination from neighboring land uses, they are not designed for pollutant removal during a storm. With vegetated buffers, some pollutant removal studies have shown that they range in effectiveness (Table 1). Proper design of buffers can help increase the pollutant removal from stormwater runoff (Table 2).

Table 1. Pollutant Removal Rates (%) in Buffer Zones					
Reference	Buffer Vegetation	Buffer Width (meters)	Pollutant		
			TSS*	TP*	TN*
Dillaha <i>et al.</i> 1989	Grass	4.6	63	57	50
		9.1	78	74	67
Magette <i>et al.</i> 1987	Grass	4.6	72	41	17
		9.2	86	53	51
Schwer and Clausen 1989	Grass	26	89	78	76
Lowrance <i>et al.</i> 1983	Native hardwood forest	20 - 40	-	23	-
Doyle <i>et al.</i> 1977	Grass	1.5	-	8	57
Barker and Young 1984	Grass	79	-	-	99
Lowrance <i>et al.</i> 1984	Forested	-	-	30-42	85
Overman and Schanze 1985	Grass	-	81	39	67
Young <i>et al.</i> 1980	Grass	27.4	-	88	87

*TSS: Total Suspended Solids; TP: Total Phosphorus; TN: Total Nitrogen

Continued...

Table 2. Factors Affecting Buffer Pollutant Removal Performance	
Factors that Enhance Performance	Factors that Reduce Performance
Slopes less than 5%	Slopes greater than 5%
Contributing flow lengths < 150 ft.	Overland flow paths over 300 feet
Water table close to surface	Groundwater far below surface
Check dams/ level spreaders	Contact times less than 5 minutes
Permeable, but not sandy soils	Compacted soils
Growing season	Non-growing season
Long length of buffer or swale	Buffers less than 10 feet
Organic matter, humus, or mulch layer	Snowmelt conditions, ice cover
Small runoff events	Runoff events > 2 year event.
Entry runoff velocity less than 1.5 ft/sec	Entry runoff velocity more than 5 ft/sec
Swales that are routinely mowed	Sediment buildup at top of swale
Poorly drained soils, deep roots	Trees with shallow root systems
Dense grass cover, six inches tall	Tall grass, sparse vegetative cover

Cost Considerations

Several studies have documented the increase of property values in areas adjacent to buffers. The real costs of instituting a buffer program for local government involve the extra staff and training time to conduct plan reviews, provide technical assistance, field delineation, construction and ongoing buffer education programs. To implement a stream buffer program, a community will need to adopt an ordinance, develop technical criteria, and invest in additional staff resources and training. The adoption of a buffer program also requires an investment in training for the plan reviewer and the consultant alike. Manuals, workshops, seminars and direct technical assistance are needed to explain the new requirements to all the players in the land development business. Lastly, buffers need to be maintained and resources should include systematic inspection of the buffer network before and after construction and work to increase resident awareness about buffers.

One way to relieve some of the significant financial hardships for developers is to provide flexibility through buffer averaging. Buffer averaging allows developers to narrow the buffer width at some points if the average width of the buffer and the overall buffer area meet the minimum criteria.

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