



Stormwater Management

Assessment Worksheet



Community Environmental Management

March 2004

Acknowledgements

**The New York State Soil & Water Conservation Committee
and the Department of Environmental Conservation
are grateful to our partners who contributed to this worksheet including:**

Thanks go to Ed Hoxsie and Julie Melançon
who conducted the original Dutchess County pilot
upon which this worksheet was based.

Thanks also go to Cally Miklasz and Joe Ghosen
who field-tested the worksheet with the Town of Eden in Erie County.

We also would like to thank our County Soil & Water Conservation District colleagues
Paula Smith, Dave Wick, Chip McElwee and Tom McMahon
for their review and comments.

Additionally we appreciate the helpful feedback from
the entire Stormwater Workgroup, especially
Don Lake, Dave Graves, Ken Smith, Robin Warrender, Dennis Mildner,
Shohreh Karimipour and Lauren Miller.

CEM Logo designed by Oan Somboonlakana. Photo credits go to Bill Morton.

Additional thanks go to Barbara Silvestri and Emily Dodd for their comments
and assistance in layout, editing and design.

We also appreciate the support provided by the
New York State Departments of Agriculture & Markets, State and Health.

Special thanks go to Donna Somboonlakana and the US Environmental Protection Agency
for Clean Water Act – Section 319 funding support.

Unending gratitude goes to Phil DeGaetano, Lois New, Gerry Chartier, Bill Morton,
Rich Lewis, John Wildeman and Ron Kaplewicz
without whom CEM would never have become a reality.



Community Environmental Management



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Introduction

Surface runoff, as a result of excessive rainfall, is a natural process. Surface runoff is nature's chisel, which has formed the landscape as we know it today. The landscape process involves the erosion of upland areas and the subsequent building of floodplains and wetlands. Without man's interference, this landscaping process is very slow with the underlying rock, soil and surface vegetation tending to resist the chisel. This process is normally so slow that changes are barely perceptible from decade to decade or even century to century.¹

Either through ignorance of ecosystem functions, poor planning, or just plain indifference to natural stormwater runoff processes, humans, through construction and development activities, have created a number of problems for themselves and nature. The first and perhaps most obvious problem is development in floodplains, putting life and possessions in jeopardy. Second, the development and urbanization of uplands has increased erosion and accelerated the runoff process altering natural resource patterns and increasing the flood hazard. Finally, many of civilization's contaminants are transported in stormwater runoff, which ultimately can enter and degrade the quality of streams, rivers, lakes, wetlands and estuaries.

Through their planning and regulatory functions, local governments have the principal responsibility for controlling developmental activities in New York State. This role carries with it the responsibility for ensuring that developmental activities are undertaken with the safety of future inhabitants in mind, and in a manner that is compatible with the protection and enhancement of natural resources, including water resources.

The purpose of the stormwater worksheet is to assess the nature of a community's stormwater runoff problems, and evaluate the community's capacity to remediate existing problems and prevent their recurrence.

¹ "Maryland Interim Watershed Policy", Water Resources Administration, Department of Natural Resources, (Annapolis, MD 1977)

Summary of Stormwater Management Practices

Stormwater Management Practices (SMPs) have been designed to mimic pre-development hydrology in a watershed and remove society's contaminants from stormwater runoff while controlling erosion and sedimentation. SMPs can be broken down into three categories as follows:

Structural

Structural measures include, for example, such devices as sediment detention ponds to remove sediment from runoff during construction; extended detention ponds to control the volume and rate of runoff; wet ponds to control the volume and rate of runoff while achieving water quality enhancement benefits; and infiltration basins, to remove contaminants from runoff. The above are examples of commonly used structural SMPs. Examples of structural SMPs and how to design for their application on specific development sites can be found in the *New York State Stormwater Management Design Manual*² and *New York Standards and Specifications for Erosion and Sediment Control*.³ Descriptions of SWPs, their purpose, effectiveness, limitations, etc., also may be found in the *Urban/Stormwater Runoff Management Practices Catalogue for Nonpoint Source Pollution Prevention in New York State*.⁴

Non-structural

Non-structural SMPs include, for example, grass swales and grass filter strips. Grass swales frequently are designed to intercept and slow down sheet flow from surrounding lands so as to detain stormwater runoff and facilitate infiltration. Descriptions of non-structural SWPs, their purpose, effectiveness, limitations, etc., may be found in the *Urban/Stormwater Runoff Management Practices Catalogue for Nonpoint Source Pollution Prevention in New York State*.

Administrative

Administrative practices include, for example, changes in land use regulations and development policies to encourage putting conservation design into development, better site design and low impact development all of which use natural features on the site to enhance the control and management of stormwater runoff. A discussion of administrative approaches may be found in *Reducing the Impacts of Stormwater Runoff From New Development*.⁵

No Adverse Impact⁶

As New York State, becomes increasingly more developed, flood damages can be expected to increase. Construction anywhere in the community can increase the risk of flooding to other properties, even those that have never been flooded in the past. Federal and State standards do not fully consider the impact of new development, so communities should implement a higher standard to protect themselves. The Association of State Floodplain Managers has developed and strongly recommends that communities adopt a No Adverse Impact (NAI) approach to development. The NAI will not only reduce flood losses, but also will save lives, protect property and reduce the amount of your tax dollars that are spent on recovery.

² "New York State Stormwater Management Design Manual," NYS Dept. of Environmental Conservation, (Albany, NY 2003)

³ "New York State Standards & Specifications for Erosion & Sediment Control," NYS Department of Environmental Conservation, (Albany NY 2003)

⁴ "Urban/Stormwater Runoff Management Practices Catalogue for Nonpoint Source Pollution Prevention in New York State" (Albany, NY 2002)

⁵ "Reducing the Impacts of Stormwater Runoff From New Development", NYS Department of Environmental Conservation (Albany, NY 1992)

⁶ "No Adverse Impact," Association of State Floodplain Managers, (Madison, WI 2002)

As your community moves forward in building, planning, and policy creation relative to stormwater management, consider incorporating the NAI concept into your work. You can do this by making sure that the actions taken in the floodplain, and throughout the watershed, do not lead to adverse impacts on the property of others. Adverse impacts need to be mitigated to prevent transferring the problems to another property or community. The worksheets on stormwater management and flood mitigation provide strategies that can be employed in developing management programs for your community and watershed to achieve NAI objectives.

Community Benefits from a Natural Resources Management Approach

Conserving and protecting the natural resources of a community is a vital underpinning to the quality of life in the community and its economic well-being. The correlation between natural resources degradation and economic decline and deterioration of the quality of life in a community is clear. Stormwater runoff from development, whether from new or existing development, should be properly controlled and managed to protect community resources. The community, whether or not it is regulated for stormwater purposes, has a primary responsibility to ensure that stormwater runoff from the development it approves does not threaten public health or safety, public and private infrastructure, and real property. For many communities, this worksheet on stormwater management may be the initial step a community takes to reduce the impacts from stormwater runoff associated with development.

How This Worksheet Can Be Used To Assist A Community

This worksheet on stormwater management can be used to help a community:

- 1) More fully understand stormwater management concepts
- 2) Assess the effectiveness of an existing stormwater management program
- 3) Identify stormwater management needs
- 4) Develop a stormwater management strategy to address identified needs
- 5) Meet NYS Phase 2 Stormwater requirements necessary for regulated small Municipal Separate Storm Sewer Systems (MS4s) in urbanized areas

Linkage to Phase 2 Stormwater Regulations for Regulated MS4 Communities:

As mandated by the Clean Water Act, the U.S. Environmental Protection Agency has developed and is implementing a nationwide stormwater management permitting program under the National Pollutant Discharge Elimination System (NPDES). Many states, including New York, are approved NPDES permit issuing authorities and implement the federal stormwater regulations through EPA approved programs. Phase 1 of this program addresses stormwater runoff from:

- (1) 'medium' and 'large' municipal separate storm sewer systems (MS4s) generally serving populations of 100,000 or greater;*
- (2) construction activity disturbing five acres or greater, and*
- (3) eleven categories of industrial activity including construction.*

Phase 2 expands the program by requiring additional operators of 'small' MS4s in urbanized areas (i.e.: those less than 100,000 in population) and operators of construction sites throughout the State to implement programs and practices to control polluted runoff. The Phase 2 rule regulates two classes of stormwater discharges: (1) an operator of a small MS4s located in 'urbanized areas' as delineated by the Bureau of the Census, and (2) operators of construction activities disturbing one acre or more of land. The Phase 2 rule defines a 'small' MS4 stormwater management program as a program comprising six elements that, when implemented in concert, are expected to result in significant reductions in pollutants discharged into water bodies. The six program elements, termed "minimum control measures" are:

- (1) Public education & outreach*
- (2) Public participation & involvement*
- (3) Illicit connection detection & elimination*
- (4) Construction site runoff*

- (5) Post-construction controls
- (6) Good housekeeping & pollution prevention

This worksheet can be used to help a community understand the value of implementing these six minimum measures. Details on New York's Phase 2 program can be found on the DEC website noted at the end of this section.

The worksheet is broken down as follows:

Part 1 – *Community Risk Assessment Factors*

The more factors the community checks, the more prepared they will be to address stormwater runoff.

Part 2 – *Community Problems & Needs Assessment*

Assists communities in focusing on specific stormwater problems, the causes of the problem and impacts. This part also enables a community to evaluate its capacity to address stormwater problems through the identification of barriers it faces in implementing one option or another, and it allows for an identification of assistance needed to overcome a specific barrier or obstacle.

It is recommended that County Water Quality Coordinating Committees particularly the Soil & Water Conservation Districts assist communities and non-governmental organizations in completing this worksheet. Participation of the County Coordinating Committee and Districts can serve as a conduit for obtaining further information and technical assistance on stormwater management.

Additional Resources

The following reference materials are also available to assist communities with stormwater management:

Technical References:

New York State Stormwater Management Design Manual, prepared by The Center for Watershed Protection for the NYS Department of Environmental Conservation, Albany, NY 2001

New York Standards and Specifications for Erosion and Sediment Control, NYS Department of Environmental Conservation, Albany, NY 2003

Construction Management Practices Catalogue for Nonpoint Source Pollution Prevention in New York State, NYS Department of Environmental Conservation, Albany, NY 2002

Urban/Stormwater Runoff Management Practices Catalogue for Nonpoint Source Pollution Prevention in New York State, NYS Department of Environmental Conservation, Albany, NY 2002

Reducing the Impacts of Stormwater Runoff from New Development, NYS Department of Environmental Conservation, Albany, NY 1992

Stormwater Strategies: Community Responses to Runoff Pollution, Natural Resources Defense Council 1999

Educational Materials:

LEAPE – “Locally-led Education and Action for Protecting the Environment”, A Program of Cornell Cooperative Extension and Sea Grant, Ithaca, NY 2003

NEMO – “Nonpoint Education for Municipal Officials”, Connecticut Cooperative Extension, University of Connecticut, Storrs, CT 2001

Power Point Modules Prepared by the University of Buffalo Center for Integrated Waste Management for the NYS Department of Environmental Conservation and NYS Department of State, 2003:

Stormwater Runoff & Erosion Control for Local Elected Officials,

Stormwater Runoff & Erosion Control for Local Planning Board Members
Stormwater Runoff & Erosion Control for Plan Review and Compliance Personnel

Websites:

Center for Watershed Protection

www.cwp.org

NYS Department of Environmental Conservation, Division of Water

www.dec.state.ny.us/website/dow/mainpage.htm





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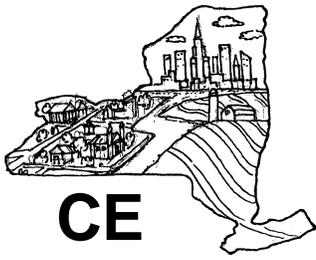
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Part 1- Community Risk Assessment Factors

The following is a list of activities communities are undertaking to improve their stormwater management techniques and minimize pollution and other negative impacts resulting from improper stormwater management, such as flooding. The more factors that apply to your community, the less likely you are to have adverse stormwater impacts from development.

Please check all that pertain to your community:

- The public is informed about the impacts that stormwater runoff can have on water quality and flooding.
- Community residents are involved in developing a stormwater program for their community or watershed.
- A program is developed and implemented to detect and eliminate illicit discharges and connections to the storm sewer system
- Erosion and sediment control (E&S) plans are developed and implemented for construction activities that disturb 1 or more acres.
- Stormwater pollution prevention plans (SWPPPs) are developed and implemented on disturbed sites 5 acres or more, or one acre or more, if located in a TMDL watershed or discharging to an impaired, 303(d) listed water, to address the downstream impacts of polluted runoff and increased volume of stormwater runoff
- Inspections are conducted of all construction sites to ensure E&S Plans or SWPP Plans are being properly implemented.
- An operation and maintenance plan for preventing or reducing stormwater pollution from municipal facilities and stormwater infrastructure has been implemented
- Existing wetlands are prevented from being filled or drained.
- New wetlands are constructed and/or damaged wetlands are restored to treat stormwater runoff and reduce flooding.
- Community is actively involved in watershed-wide planning and management of stormwater.
- Cumulative impacts of development on stormwater quality and quantity in the watershed are considered when reviewing the adequacy of stormwater management techniques being implemented in new developments.
- Reliable and accurate sources of technical expertise are utilized to review site plans for potential stormwater impacts.
- Community has implemented development policies that encourage developers to retain as much as possible the natural features of sites being developed.
- Community monitors their stormwater program to evaluate effectiveness.



Stormwater Management Worksheet

Part 2- Problem & Needs Assessment

This assessment will help to determine how extensive stormwater problems are in your community, and your community's capacity for addressing them.

Problems Associated with Stormwater Runoff	Causes	Impacts	Remedial & Preventative Strategies
<p>Frequent overtopping of stream banks</p> <p>___ Yes ___ No</p> <p>Frequency and duration of overtopping of ditches, culverts, roads or bridges</p> <p>Explain:</p> <p>_____</p> <p>_____</p> <p>Locations</p> <p>List:</p> <p>_____</p> <p>_____</p>	<p>1. Increase in rate and volume of runoff due to increased percentage of impermeable surface area in watershed from development.</p> <p>2. Loss of wetlands that function to receive excess rainfall and release it slowly</p>	<p>Check all that apply:</p> <p>___ Increased flooding and flood damages</p> <p>___ Expansion of the floodplain</p> <p>Magnitude and duration of flooding</p> <p>Explain:</p> <p>_____</p> <p>_____</p>	<p>Strategies:</p> <p>Mitigate the impacts of increased stormwater flow and volume from developed and redeveloping areas</p> <p>Reduce the impacts of increased storm water flow & volume from new development</p> <p>Address erosion and sediment control needs resulting from construction activities</p>

Management Options Indicate with a "0" if community has implemented or use a "?" if community is interested	Barriers to Implementation	Community Assistance Needs⁷
<p>Options:</p> <ul style="list-style-type: none"> ___ Utilize Maximum Extent Practicable (MEP) Standards that suit your community's needs on a site by site basis ___ Implement flood mitigation plan (see Flood Mitigation Worksheet) ___ Evaluate and retrofit existing storm water system by installing stormwater detention practices where applicable ___ Restore wetlands within the watershed to increase flood education benefits ___ Implement maintenance requirements for Stormwater Management Practices (SMPs) on new and existing development ___ Preserve existing wetlands in the watershed by utilizing conservation easements or regulations ___ Enact local stormwater management and erosion control ordinance ___ Minimize the percent of imperviousness allowed in new developments ___ Utilize Low Impact Development⁸ principles to reduce runoff potential from new developments ___ Implement flood control design criteria⁹ for sizing storm water detention and infiltration practices ___ Conduct build out analysis to assess cumulative impacts of future development in the watershed ___ Develop a monitoring program to inspect SMPs on construction sites to make sure they are functioning properly ___ Ensure Stormwater Pollution Prevention plans are implemented for new developments of five acres in size or more, or 1 acre or more in size, if located in a TMDL watershed or discharging to an impaired, 303(d) listed water ___ Work with other municipalities in the watershed to reduce the impacts of increased stormwater flow and volume from new development throughout the watershed 		

⁷ List type of assistance needed: info/education, assessment/planning, BMP design/implementation, regulatory options, project funding, etc.

⁸ See NYSDEC publication: [Reducing the Impacts of Stormwater Runoff From New Development](#)

⁹ See NYSDEC publication: [New York State Stormwater Design Manual, October 2001](#)

Problems Associated with Stormwater Runoff	Causes	Impacts	Remedial & Preventative Strategies	
<p>Water quality impairments</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Indicators of impairments</p> <p>Check all that apply:</p> <p><input type="checkbox"/> Muddy water running off construction sites</p> <p><input type="checkbox"/> Sheens on surface water</p> <p><input type="checkbox"/> Debris/litter washing off streets and parking lots</p> <p><input type="checkbox"/> Stormwater impairments identified on the Priority Water bodies List (PWL)</p> <p><input type="checkbox"/> Other: _____ _____</p>	<p>1. Pollutants from urbanized land run off in storm water (ex: sediments, toxic metal particles, pesticides and fertilizers, oil and grease, pathogens, excess nutrients, and trash)</p> <p>2. Illicit storm-water discharges</p> <p>3. Loss of wetlands that trap sediment and filter nutrients and toxic substances</p> <p>4. Uncontrolled discharges from existing storm sewers result in high flow and velocity which erode stream banks</p>	<p>Check all that apply:</p> <p><input type="checkbox"/> Excessive weed and algae growth in lakes, reservoirs and estuaries from excessive nutrients</p> <p><input type="checkbox"/> Loss of lake, stream or reservoir capacity due to sedimentation</p> <p><input type="checkbox"/> Loss of fish spawning habitat due to sedimentation</p> <p><input type="checkbox"/> Contamination of shellfish beds</p> <p><input type="checkbox"/> Contamination of ground and surface drinking water supplies from excess loading of pollutants</p> <p><input type="checkbox"/> Beach closures due to high coliform levels</p> <p><input type="checkbox"/> Increased stream flow and velocity increases sediment loading from stream bank erosion</p>	<p>Strategies:</p> <p>Inform the public of the risk that uncontrolled stormwater runoff poses to their waterbodies</p> <p>Involve the public in identifying potential water quality impairments from stormwater</p> <p>Develop and implement a program to detect illicit discharges</p> <p>Enhance the quality of stormwater runoff entering surface and groundwater</p> <p>Address erosion and sediment control needs during construction</p> <p>Reduce the impacts of increased stormwater flow and volume from new development</p> <p>Mitigate post construction stormwater impacts</p> <p>Implement "Good Housekeeping" practices</p> <p>Preserve natural resource features of the site being developed</p> <p>Utilize land use planning as a tool to prevent future stormwater problems</p>	

<p style="text-align: center;">Management Options</p> <p style="text-align: center;">Indicate with a "0" if community has implemented or use a "?" if community is interested</p>	<p style="text-align: center;">Barriers to Implemen- tation</p>	<p style="text-align: center;">Community Assistance Needs¹⁰</p>
<p>Options:</p> <ul style="list-style-type: none"> ___ Implement a storm drain stenciling program ___ Support a volunteer water quality monitoring program ___ Design and implement SMPs to treat stormwater runoff following guidance provided in the <i>NYS Stormwater Design Manual</i> ___ Facilitate community clean-up days to collect litter and debris from public lands, as well as toxic and hazardous materials from homes (ex: used oil, old paint, cleaning products) ___ Conduct informational campaigns to educate the public about nonpoint source stormwater pollution and what they can do at home to prevent it (ex: minimize fertilizer and pesticide use on lawns, clean up pet waste) ___ Evaluate the effectiveness of SMPs to be implemented for the protection of groundwater resources ___ Adopt an erosion control/stormwater management ordinance ___ Identify and correct illicit discharges ___ Implement a scheduled maintenance program for municipal stormwater systems (ex: catch basin cleanouts, street sweeping, ditch cleaning and seeding/mulching) ___ Identify watershed stormwater runoff and related nonpoint source pollution reduction needs ___ Develop an operations and maintenance program to reduce or prevent pollutant runoff from municipal operations ___ Develop watershed/wellhead protection plans for surface and groundwater drinking water sources that may be at risk from future land use development activities ___ Identify level of impairment for impacted surface and ground-water and map their locations ___ Develop clear requirements for long-term operation and maintenance of SMPs not only during the development phase, but also after construction is complete ___ Retrofit stormwater management practices where existing development is impairing water quality (ex: installing catch basin hoods to control floatable debris). ___ Restore wetlands that would enhance water quality (ex: filter out pollutants, trap sediment) 		

¹⁰ List assistance needed: info/education, assessment/planning, BMP design/implementation, regulatory options, project funding, etc.

Problems Associated with Stormwater Runoff	Causes	Impacts	Remedial & Preventative Strategies
<p>Decreased Groundwater Recharge and Decreased Stream Base Flows</p> <p>___Yes ___No</p> <p>Locations List:</p> <p>_____</p> <p>_____</p>	<p>1. Increase in rate and volume of surface runoff due to increased percentage of impermeable surface area in watershed</p>	<p>Check all that apply:</p> <p>___ Reduced or depleted groundwater supplies during periods of drought</p> <p>___ Degraded fisheries habitat due to lower stream flows</p>	<p>Strategy: Enhance the infiltration of storm water runoff</p> <p>Strategy: Preserve the natural features of the site</p> <p>Strategy: Reduce the stormwater flow and volume from new developments</p>
<p>Increased Stream Temperatures</p> <p>___Yes ___No</p> <p>Locations List:</p> <p>_____</p> <p>_____</p>	<p>1. Heat from impermeable surfaces is transmitted to receiving waters during summer storm events</p>	<p>Degradation or loss of cold water fisheries habitat</p> <p>___Yes ___No</p>	<p>Strategy: Enhance the quality of storm water runoff</p> <p>Strategy: Preserve the natural features of the site</p> <p>Strategy: Reduce the impacts of increased stormwater flow and volume from new developments</p>

<p align="center">Management Options</p> <p align="center">Indicate with a "0" if community has implemented or use a "?" if community is interested</p>	<p align="center">Barriers to Implementation</p>	<p align="center">Community Assistance Needs¹¹</p>
<p>Options:</p> <p>___ Retrofit existing stormwater management system to maximize infiltration and groundwater recharge</p> <p>Options:</p> <p>___ Restore riparian forest buffers in the watershed to slow the movement of stormwater and provide opportunity for infiltration and groundwater recharge</p> <p>Options:</p> <p>___ Maximize groundwater recharge through the selection of storm water practices that encourage infiltration during the planning stage of development or redevelopment</p> <p>___ Minimize amounts of impervious surface in new developments by encouraging the use of practices such as paver mats for driveways and parking lots</p> <p>___ Minimize the amount of directly connected impervious surfaces in new developments (ex: bio-filters and filter areas)</p>		
<p>Options:</p> <p>___ Reduce the amount of impermeable area where water can be heated before entering streams</p> <p>___ Retrofit existing stormwater management system to maximize ground water infiltration and minimize heated runoff</p> <p>Options:</p> <p>___ Revegetate stream banks with willows</p> <p>___ Restore riparian forest buffers in the watershed to provide shade</p> <p>Options:</p> <p>___ Maximize groundwater recharge through the selection of storm water practices that encourage infiltration during the planning stage of development or redevelopment</p> <p>___ Minimize amounts of impervious surface in new developments by encouraging the use of practices such as paver mats for driveways and parking lots</p> <p>___ Minimize the amount of directly connected impervious surfaces in new developments (ex: bio-filters and filter areas)</p>		

¹¹ List assistance needed: info/education, assessment/planning, BMP design/implementation, regulatory options, project funding, etc.

Problems Associated with Stormwater Runoff	Causes	Impacts	Remedial & Preventative Strategies
<p>Unstable Stream Channels</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Extent Describe: _____ _____</p> <p>Locations List: _____ _____</p>	<p>1. Increase in rate and volume of stormwater runoff from new and existing development results in streambank erosion and stream destabilization</p>	<p>Check all that apply:</p> <p><input type="checkbox"/> Widening of stream channels</p> <p><input type="checkbox"/> Braiding of stream channel</p> <p><input type="checkbox"/> Down cutting (incising) or building up (aggradation) of stream bottom due to deposition of sediment in stream channel</p> <p><input type="checkbox"/> Stream bank erosion</p> <p><input type="checkbox"/> Degradation or loss of fisheries habitat</p>	<p>Strategy:</p> <p>Mitigate stormwater impacts from developed and redeveloping areas that contribute to stream channel destabilization</p> <p>Strategy:</p> <p>Reduce the impacts from an increase in the volume and rate of stormwater runoff associated with new development to minimize or eliminate stream bank erosion</p>

Concerns Associated with Stormwater Runoff	Associated Problems	Impacts	Remedial & Preventative Strategies
<p>Check all that apply:</p> <p><input type="checkbox"/> A lack of community consensus on stormwater management issues and what can be done to address them</p> <p><input type="checkbox"/> Meeting new stormwater requirements from state and federal mandates</p> <p><input type="checkbox"/> Our community's designation as a MS4 and how we will meet the requirements</p> <p><input type="checkbox"/> Receiving and providing the best information and training to people who make decisions about development and stormwater management</p> <p><input type="checkbox"/> Implementing a stormwater program as an essential component of sustainable community development</p> <p><input type="checkbox"/> Increased operating and maintenance costs for the existing stormwater infrastructure</p> <p><input type="checkbox"/> Proper plan review for Stormwater Pollution Prevention Plans (SWPPP) for development</p> <p><input type="checkbox"/> Confusion over local authority to address stormwater concerns</p>	<ol style="list-style-type: none"> 1. At present, the community is not implementing a stormwater management program 2. The community is experiencing development pressure and is having difficulty balancing economic development and growth with natural resource protection 3. The community does not have adequate resources to operate and maintain their stormwater infrastructure 	<p>Increased stormwater runoff causes adverse impacts on water quality and stream health resulting in the need for costly restoration and remediation</p>	<p>Strategy: Develop, fund and implement a local stormwater management program</p>

<p style="text-align: center;">Management Options</p> <p style="text-align: center;">Indicate with a "0" if community has implemented or use a "?" if community is interested</p>	<p style="text-align: center;">Barriers to Implementation</p>	<p style="text-align: center;">Community Assistance Needs¹³</p>
<ul style="list-style-type: none"> ___ Provide training and information about regulatory updates to officials responsible for managing stormwater ___ Develop a checklist of site plan components the municipality requires for those interested in submitting a plan for development to cut down on the time it takes to review and approve an incomplete plan ___ Non-MS4 communities require developers to submit SWPPP for local review ___ Implement education program for developers, homeowners, businesses, highway superintendents, etc. ___ Involve the public in stormwater management policy development ___ Inform engineers, local officials and construction personnel about new Phase II requirements for stormwater management and erosion and sedimentation control on an ongoing basis ___ Review development rules and regulations in your community to utilize Low Impact Development and Conservation Site Design⁴ ___ Develop agreements with County SWCDs, or employ an engineer, to help review stormwater management and erosion and sediment control plans for development ___ Ensure developers and contractors implement SWPPPs for all developments over one acre by inspecting and enforcing regulations, as well as use strategies such as site bonds to ensure compliance ___ Develop intermunicipal agreements to deal with nonpoint source pollution on a watershed level <p style="text-align: center;">Note:</p> <p style="text-align: center;">It is recommended that you also complete the Sustainable Development Worksheet to further assess the balance of development, economic growth and natural resource protection in your community</p>		

¹³ List assistance needed: info/education, assessment/planning, BMP design/implementation, regulatory options, project funding, etc.

⁴ See Center for Watershed Protection publication: [Better Site Design: A Handbook for Changing Development Rules in Your Community](#)

Community Environmental Management COMMUNITY STORMWATER MANAGEMENT PROGRAM

Stormwater management is a complex issue, with many factors needing to be addressed. This outline lists six strategies with corresponding management options that if implemented will help communities minimize potential environmental impacts from stormwater runoff. These strategies directly relate to the six minimum measures required for Phase II MS4s.

Strategy: Plan and Implement a Public Education and Outreach Program

- Prepare an outreach and education plan that will enhance the public understanding of the impacts of stormwater polluted runoff on waterbodies, the pollutants of concern and their possible sources and what needs to be done to reduce stormwater pollution from new and existing developments
- Implement stormwater education programs for homeowners, businesses, developers, highway superintendents, town boards etc.
- Ensure local officials are trained on stormwater management (e.g. Code Enforcement Officers)

Strategy: Develop and Implement a Public Involvement/Participation Plan

- Form an advisory committee within the community and in cooperation with other communities
- Utilize intermunicipal agreements
- Seek out and establish list of stake holders who would like to be apprised of milestones and give input to decisions
- Provide a mechanism to ensure program accountability
- Encourage citizen volunteer programs to help implement stormwater management activities such as beach clean ups, litter pickups, stream and lake monitoring and field surveys, storm drain stenciling.

Strategy: Develop, Implement and Enforce a Program to Detect and Eliminate Illicit Discharges

- Develop and map the location of all outfalls
- Prohibit, through ordinance or other regulatory mechanism, illicit discharges into the storm sewer system and implement appropriate enforcement procedures and actions
- Develop and implement a program to detect and address non-stormwater discharges (i.e. irrigation water, failing septic systems, lawn watering residential car washing, dechlorinated swimming pool discharges etc) if determined to be a substantial contributor of pollutants to the system
- Inform public employees, businesses and the general public of the hazards associated with illegal and improper disposal of wastewater

Strategy: Develop, Implement and Enforce a Program to Control Runoff from Construction Sites by:

Addressing erosion and sediment control needs during construction

- Expand local subdivision regulations to cover erosion & sedimentation control
- Require erosion and sedimentation control plans for new developments disturbing 1 acre or more
- Train construction site operators about state and local stormwater management requirements
- Post bonds to ensure compliance by developers and contractors
- Conduct site inspections during construction to ensure E&S practices are installed and being properly maintained
- Enact local erosion and sediment control ordinance

Reducing the potential for stormwater runoff to pollute groundwater and surface water

- Identify existing ground and surface water resources in site plans
- Design and implement storm water management practices (SMPs) to treat stormwater runoff
- Evaluate effectiveness of SMP's to be implemented for potential impacts to groundwater as well as surface water
- Enact local stormwater management ordinance that requires water quality impacts of new development be addressed

Reducing the construction/post construction impacts of increased stormwater flow and volume from new development

- Require SMPs to reduce channel erosion, prevent over bank flooding and help control extreme floods
- Ensure implementation of stormwater pollution prevention plans (e.g. compliance checks, site bonds)
- Limit percent of imperviousness allowed per site
- Implement low-impact development SMPs that induce infiltration
- Implement conservation designed subdivision regulations
- Encourage infill development
- Establish a dedicated funding source (i.e. stormwater utility, permit fees).

Strategy: Mitigate Post Construction Stormwater Impacts from Existing and Redeveloped Areas

Reducing polluted runoff from existing and redeveloped areas

- Identify stormwater hot spots
- Retrofit existing stormwater management system
- Use maximum extent practicable (MEP) standards
- Restore wetlands in the watershed to enhance flood retention and water quality benefits
- Restore stream channels to their natural conditions where practicable
- Implement flood mitigation plan to reduce flooding damages from increased development in the watershed

- Implement a scheduled maintenance program for municipal stormwater system (i.e. cleanout of catch basins, street sweeping, etc.)

Strategy: Develop and Implement a Local Stormwater Pollution Prevention Program that:

Includes “ good housekeeping practices” to reduce and prevent the discharge of pollutants from activities such as park maintenance, fleet and building maintenance, roadway maintenance, hydrologic and habitat modification and marina operations

- Examine municipal operations and alter actions where needed for pollution prevention
- Develop maintenance procedures for structural and nonstructural controls (e.g. reseeded of road ditches after sediment removal)
- Develop long term inspection procedures for structural and nonstructural controls
- Develop procedures for proper waste disposal and transfer (e.g. household hazardous waste collection days)
- Protect hazardous material storage areas

Preserves and utilizes natural features and processes of the site being developed¹⁴

- Retain existing riparian forest buffers and wetlands
- Protect sensitive areas
- Promote conservation designed development
- Promote low-impact development integrated SMPs for on-lot use
- Design SMPs considering aesthetics and passive recreation use

Utilizes land use planning as a tool to identify potential stormwater problems by evaluating the environmental impacts of future development and then mitigating for those impacts¹⁴

- Establish no adverse impact goal for new development in the community
- Implement a watershed approach to assess development impacts and identify pollution prevention needs
- Conduct build out analysis of watershed to identify cumulative downstream impacts
- Minimize percent of imperviousness allowed within the watershed or per site
- Identify existing wetlands, riparian forest buffers and environmentally sensitive areas in the watershed that provide flood retention and water quality benefits
- Update comprehensive plan to include provisions for protecting a community’s natural resources while planning for growth
- Implement conservation and performance zoning
- Change development rules to allow developments to be built that conserve the natural amenities of the site
- Revise subdivision regulations to allow conservation site design principles to be used
- Identify for each watershed in the community, stormwater runoff and related nonpoint source pollution reduction needs
- Develop watershed/wellhead protection plans for community drinking water sources most at risk from future development activities

¹⁴ For MS4s, these are not required, but recommended