

# NPDES Phase II Cost Estimates

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## Introduction

The United States Environmental Protection Agency (EPA) has published final rules expanding the existing stormwater NPDES permitting program to smaller cities and other urban areas throughout the United States. Due both to external pressures and directives from the current and past administrations, EPA is conscious of attempting to make the current stormwater NPDES program “cost-effective.” For example:

“EPA believes this rule will cost significantly less than the existing 1995 rule that is currently in place, and will result in significant monetized financial, recreational and health benefits, as well as benefits that EPA has been unable to monetize, including reduced scouring and erosion of streambeds, improved aesthetic quality of waters, reduced eutrophication of aquatic systems, benefit to wildlife and endangered and threatened species, tourism benefits, biodiversity benefits and reduced siting costs of reservoirs.”<sup>1</sup>

“... the Agency recognizes the continuing imperative to assure that environmental regulations accomplish statutory objectives in the least burdensome and most cost-effective fashion. As explained further in this preamble, the form and substance of NPDES permits to address the sources designated in today’s proposal would provide greater flexibility for the newly covered sources than the existing “standard” NPDES permit.”

While the “benefit” side of the proposed regulations exists in the realm of gross estimates, the “cost” side is also filled with unknowns. What will the mandated and negotiated stormwater program cost a local community? Are there ways to reduce costs? What should a local community be doing now to prepare for this regulatory program? This paper seeks to address these related questions.

The final regulations were published on December 8, 1999 and the changes from the draft regulations are only minor<sup>3</sup>. But it is still not possible to say what the regulations will cost everyone in toto. This is so because:

- there is great flexibility inherent in the regulations to create a stormwater quality program tailored to meet an individual community’s needs and situation;
- each permit writer has preferences and “hot buttons” that will color what any particular program will look like; and
- each community setting is different in terms of climate, topography, pollutants of concern, and current condition of local waters.

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<sup>1</sup> Federal Register, January 9, 1998 p. 1536

<sup>2</sup> *ibid.* p. 1550

<sup>3</sup> Federal Register, December 8, 1999 pp. 68722-68851

## Basic Approach to Permitting

Under proposed § 123.35(g), an NPDES permitting authority issues a general permit to authorize stormwater discharges from regulated small municipal separate storm sewer systems. The NPDES permitting authority will also provide a menu of regionally appropriate and field-tested Best Management Practices (BMPs) that the permitting authority determines to be “cost-effective.” The regulated small municipal separate storm sewer systems could choose to select from this menu or select other BMPs that they feel are appropriate.

Under Phase II each regulated community will need to develop a set of BMPs under each of six specific program minimums. These BMPs can be any combination of programs, structures and other controls that, in the agreed opinion of the permit writer and the regulated community, meet the standard of reducing pollution discharge to waters of the state to the Maximum Extent Practicable (MEP). In this process, permittees and permit writers would evaluate the proposed stormwater management controls to determine whether reduction of pollutants to the MEP could be achieved with the identified BMPs. EPA envisions that this evaluative process would consider such factors as condition of receiving waters, specific local concerns, and other aspects included in a comprehensive watershed plan.

Under the proposed approach, implementation of BMPs consistent with stormwater management program requirements at § 122.34 and permit provisions at § 122.33 would constitute compliance with the standard of “reducing pollutants to the maximum extent practicable.” That is, “if you do what you say you will do, you are by definition in compliance.” It is important to note that states implementing their own NPDES programs may develop more stringent requirements than those proposed in the Federal Register. In fact, we anticipate that many states will require more specific and rigorous requirements under special circumstances relating to the condition of the receiving water within, and downstream from, the community. For example, if a certain stream is required to have a Total Maximum Daily Load (TMDL) or similar study performed on it (for example, a watershed assessment for the purposes of wastewater treatment plan permitting or expansion), the NPDES stormwater Phase II permit conditions may reflect the allocation of pollutants to that community.

The steps for a community are: (1) review the conditions of the general permit, (2) develop and submit a Notice of Intent (NOI) to comply with the general NPDES permit through description of a BMP-based program under each of the six minimum controls or program areas (see below), (3) negotiate this proposed program with the permit writer, (4) receive approval of the submittal, and (5) begin implementation of the conditions and programs described in the NOI including record keeping and submittal of appropriate reports describing attainment of “measurable goals” for each BMP as described in the NOI.

## Current NPDES Phase II Program Cost Estimates

There is naturally much speculation on the actual program elements and costs for a particular stormwater program developed under Phase II. There have been several attempts at estimating Phase II program costs based on current costs of “similar” programs.

In the draft regulations, EPA had provided estimates of the probable cost implications of the NPDES Phase II Permit. These estimates were based on summary information from the permit applications from 21 Phase I cities. Very high and very low figures were thrown out by EPA in developing these estimates. Figure 1 shows the summary table developed by EPA.

The range depicted in Figure 1 is from \$1.39 to \$7.83 per person per year for the first permit five-year period, and \$1.28 to \$5.63 for other permit cycles. For a city of 50,000 that is a very wide range of \$69,500 to \$391,500 annually for the first permit cycle. This is clearly not helpful in attempting to estimate a specific community’s costs.

There is question about the vagueness in the regulatory language, and the high degree of potential flexibility inherent in briefly described program elements. For example, for the first of the minimum controls the regulatory language states:

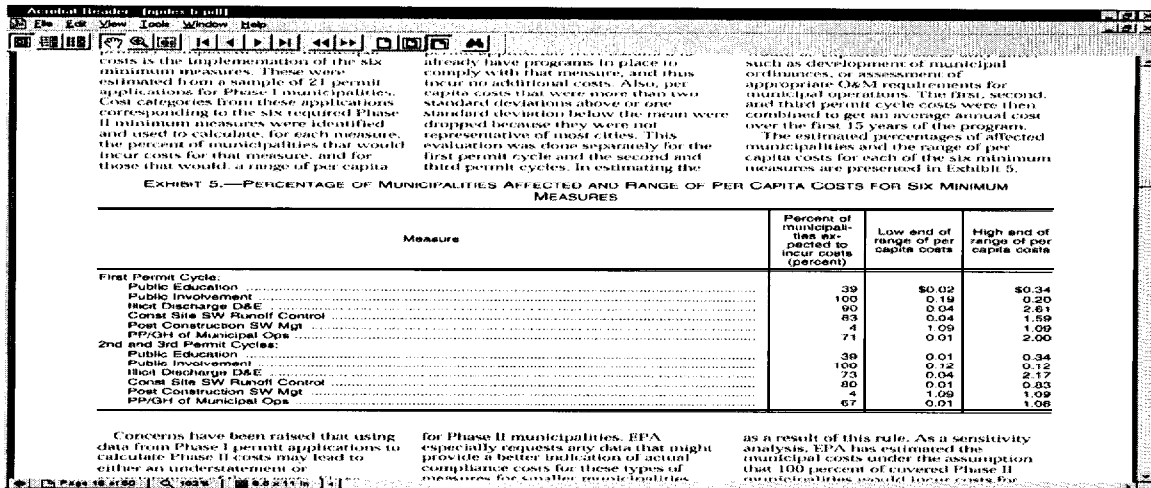


Figure 1. EPA Cost Estimates for Phase II NPDES Compliance.

1. Public education and outreach on storm water impacts<sup>4</sup>. You must implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that can be taken to reduce storm water pollution.

(You may use stormwater educational materials provided by your State, Tribe, EPA, or, subject to the approval of the local government, environmental or other public interest or trade organizations. The materials or outreach programs should inform individuals and households about the steps they can take, such as ensuring proper septic system maintenance, limiting the use and runoff of garden chemicals, becoming involved in local stream restoration activities that are coordinated by youth service and conservation corps and other citizen groups, and participating in storm drain stenciling, to reduce storm water pollution. In addition, some of the materials or outreach programs should be directed toward targeted groups of commercial, industrial, and institutional entities likely to have significant storm water impacts. For example, information to restaurants on the impact of grease clogging storm drains and to garages on the impact of oil discharges. You are encouraged to tailor your outreach program to address the viewpoints and concerns of all communities, particularly minority and disadvantaged communities, as well as children.)

The “regulatory” wording in parentheses is not mandatory but suggested. There is wide room for interpretation of the intensity and detail necessary to accomplish this minimum control. The devil is always in the details, and there will always be great variability in what two different programs intend to do to accomplish the same general goals.

NAFSMA (1999a, 1999b) published a survey on potential Phase II program costs responded to by 121 cities and counties nationally. Ten communities responded with programs that had three or more suggested elements in the first minimum control: Public Education and Outreach. The annual per capita costs for these ten ranged from \$0.04 to \$1.17 – again a wide range.

Of those responding, only one community stated that it had program activity in each of the six minimum control measure areas and it spent \$15.11 per capita annually, well above the EPA estimate (the city has a population of about 25,000). Of the 121 respondents only 26 had programs in at least three (most had only three) of the six mandatory minimum control areas, and these can be considered far from complete. Figure 2 shows the distribution of costs for these 26 programs. The vertical axis is the annual per capita cost for these elements. The median was \$1.44 and the average was \$4.07. The low value was \$0.04 and the high was \$26.00.

<sup>4</sup>Federal Register, January 9, 1998, p. 1639.

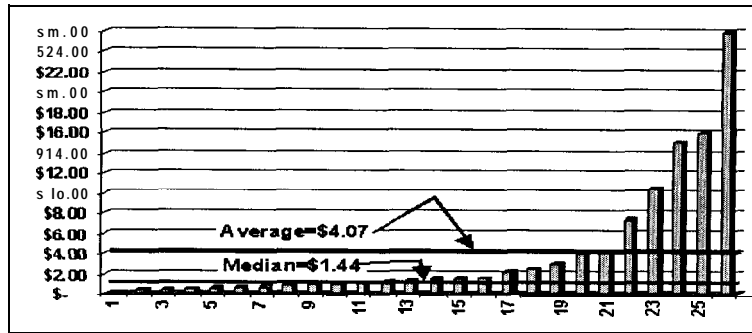


Figure 2. NAFSMA Study Program Costs.

We can speculate that if many of these communities had a fully developed Phase II program, the average costs could more than double, since each community would be adding both new program areas and upgrading their existing programs they had to make them comply with the details of the Phase II permit writers requirements.

In the final regulations, USEPA took a different approach to making estimates of the costs of compliance, using both the NAFSMA information and past experience with Phase I (EPA, 1999). EPA estimated annual costs for the municipal programs based on a fixed cost component and a variable cost component. The fixed cost component included costs for the municipal application, record keeping, and reporting activities. On average, EPA estimated annual costs of \$1,525 per municipality. Variable costs include the costs associated with annual operations for the six minimum measures and are calculated at a rate of \$8.93 annually per household (assuming 2.62 persons per household). The the cost estimating equation is:

$$\text{Annual cost} = \$1,525 + \text{population}/2.62 * \$8.93$$

Finally, rule of thumb estimates based on the author's experience working in over 100 communities indicate that comprehensive stormwater programs that include advanced stormwater quality programs cost between \$7.00 and \$20.00 per capita per year – above the EPA estimates. The quality portion is normally between 20 and 30% of the total average program cost.

### Estimating Costs from Anticipated Programs<sup>5</sup>

The methods used above do not provide details of the components of the stormwater programs resulting in the costs, and thus are not very helpful in assisting other communities in their thinking about the regulations. An effort was made to develop cost estimate ranges based on a direct interpretation of the stormwater regulations as applied to example communities at each end of the spectrum, in terms of size and intensity of water quality program. This has an advantage in that it deals directly with the stormwater regulatory requirements and illustrates specific program components so that we can control and define all details. The following sub-sections will develop two hypothetical permit applications for the six minimum controls.

#### **The Two Permittees**

Permittee one ("Smallville") is a community of 10,000 that is adjacent to a larger city that has obtained a Phase I permit or that can assist Smallville in many of its permit responsibilities. It is a small bedroom community interested in compliance with minimum disruption and cost. It does not really have an engineering or planning component of its city staff, but relies on a city administrator and hired consultants.

<sup>5</sup> Based on a presentation made by Andy Reese of Ogden Environmental at the APWA seminar, "Designing and Implementing an Effective Storm Water Management Program, Denver, 1998.

Permittee two ("Midtown") is a larger and more self-contained community with a population of 50,000 located within an urbanizing county whose total population makes it a designated "urbanized area." It is aggressively annexing growth areas, and has a thriving economy. It has a City Engineer/Public Works director, road maintenance staff, and other municipal capabilities and resources. It also has a growing stormwater quantity program and wishes to bring quality together with quantity in a comprehensive and integrated approach. It wants to take advantage of its GIS database and capability.

### ***The Programs***

We can assume that contained within, or subsequent to obtaining the general permit, the permit writer will publish a list of regionally appropriate **BMPs** to be used in permit applications. The general permit will have narrative effluent limitations which describe goals or narrative standards for each of the minimum controls. Each permittee must then develop basic program objectives and measurable standards (not included here) under the goals provided by USEPA for each of the six minimum controls. These measurable standards can be stated in terms of actions taken or results achieved. It is best to state them in terms of things that can be controlled and which do not have uncontrollable and unpredictable results.

It is also smart to schedule the programs (the schedule is not demonstrated here) in terms of phases, pilot programs, demonstration projects, trials, etc., with an evaluation process at some point in the permit. It should then be written into the NOI that this program will be modified, expanded, curtailed or even abandoned if it is not effective.

Smallville sought to obey only the letter of the law, but did not see many ways to proceed. It had no real stormwater program, no known water quality problems, and few current responsibilities. This community sought to take advantage of "big brother" next door in joint programs or education, and to adopt more regionally uniform development regulations enforced locally. Smallville sought to fund any program needs through budget changes and through economies gained by taking advantage of regional programs, free information, and expanding duties of existing staff.

Midtown sought to meet the program minimums in a more proactive way focusing on perceived needs within the community. They took advantage of the strength of existing local programs, a strong economy, a strong environmental awareness, and outside assistance where available in the form of copied resources and shared efforts. Midtown expanded its current program using EPA suggestions to build a more comprehensive and meaningful program in several key areas<sup>6</sup>. Because they did not have the ability to try to work regionally (the adjacent county had no resources for developing a stormwater program, but would cooperate as necessary) it needed to build the program alone and to work extra-territorially as appropriate. Midtown looked at each program to insure the existence of: adequate legal authority, competent technical approach, dedicated financial resources and appropriate administrative procedures and staffing.

Because program funding became an issue, Midtown sought to establish a stormwater user fee system (often called a stormwater utility) to provide stable, adequate and equitable funds. The costs and steps of the utility development are not included here.

### ***Program Objectives***

Table 1 develops the basic objectives of each of the programs in each of the six minimum areas. In real life these objectives would be developed through a series of discussions with staff and, perhaps, a citizen's group, and through early coordination with the permit writer.

Table 2, which is attached as an Appendix, gives basic cost-estimate information for the two programs. The costs are approximate and would vary depending on how all costs are accounted for, availability of staff, etc. The intent is to give ballpark estimates and not to quibble over details. In these estimates all personnel time is costed at \$50/hr regardless of

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<sup>6</sup> NAFSMA has taken an earlier version of the Midtown values, refined them, and developed a minimal and advanced program concept out of this information. That information can be obtained from NAFSMA by calling 202-218-4122.

the source of the labor (in-house or contracted). This corresponds to a fully burdened salary rate plus allocated overhead costs for a mid-level technical person.

Table 1. Basic Program Objectives

Smallville	Midtown
<i>Public Education and Outreach on Storm Water Impacts</i>	
<ol style="list-style-type: none"> <li>1. Acquire and mail existing public domain informational brochures</li> <li>2. Encourage and facilitate newspaper articles</li> <li>3. Educate the few industrial and commercial stakeholders individually</li> </ol>	<ol style="list-style-type: none"> <li>1. Acquire and mail existing and specifically pertinent public domain informational brochures to the general public</li> <li>2. Develop a stratified database of stakeholder groups and develop and execute targeted education programs</li> <li>3. Develop and implement elementary school education programs with preexisting curriculum</li> <li>4. Develop and advertise complaint hotline as a pollution hotline</li> <li>5. Develop press information and briefings with the objective of having a quarterly news article</li> <li>6. Develop and make available a slide show and speakers bureau</li> </ol>
<i>Public Involvement/Participation</i>	
<ol style="list-style-type: none"> <li>1. Develop and implement a citizens advisory group appointed by the mayor</li> <li>2. Encourage citizen participation in the neighboring city's programs for used oil, household hazardous waste, adopt-a-stream, etc. through news articles in local neighborhood newspaper</li> </ol>	<ol style="list-style-type: none"> <li>1. Develop and implement a stratified and diverse citizens advisory group/task force</li> <li>2. Develop a citizen monitoring and/or adopt-a-stream program -- may be partially federally funded</li> <li>3. Develop a student storm drain stenciling program and student dry weather screening program (see illicit connections program)</li> <li>4. Encourage the development of watershed groups for each major watershed within the jurisdiction (see BMP control)</li> </ol>
<i>Illicit Discharge Detection and Elimination</i>	
<ol style="list-style-type: none"> <li>1. Develop a stormwater major outfall map on USGS base map</li> <li>2. Modify slightly and adopt a generic ordinance available from the state or other organization.</li> </ol>	<ol style="list-style-type: none"> <li>1. Develop a major stormwater system map and inventory on existing GIS topo. Base mapping</li> <li>2. Cross-reference map with existing databases on NPDES permit holders (available from the state) and SARA Title III database to identify likely source of dry weather pollution</li> <li>3. Develop an illicit connections and illegal dumping ordinance including hotspot program</li> <li>4. Perform initial dry weather screening in several key parts of the city by student volunteers</li> <li>5. Develop inspection and enforcement capabilities and resources, and develop a detection program using city staff and a database of potential specific locations</li> <li>6. Advertise hotline and write news articles (see public education)</li> <li>7. Advertise existing private used oil disposal sites (see public education)</li> <li>8. Educate all public employees to recognize and report problems (see pollution prevention)</li> <li>9. Develop automotive industry sponsorship of spill prevention, materials management, and inspection and education programs (see public education for part of this)</li> </ol>
<i>Construction Site Storm Water Runoff Control</i>	
<ol style="list-style-type: none"> <li>1. Modify the adjacent city's sediment and erosion control ordinance to meet the regulatory minimums</li> <li>2. Modify plans review and inspection procedures to include program minimums</li> <li>3. Train city secretary to collect phone complaints and take appropriate action on erosion complaints</li> <li>4. Advertise the complaint line as part of the public education program.</li> </ol>	<ol style="list-style-type: none"> <li>1. Modify existing sediment and erosion control ordinance to include all the requirements of the regulations</li> <li>2. Add a BMP section and clear design steps to the drainage manual</li> <li>3. Conduct training and familiarization program for developers, contractors and engineers, as well as in-house training for inspectors</li> <li>4. Insure hotline has a formal and defined ability to receive and properly process erosion complaints</li> <li>5. Upgrade the erosion control inspection and enforcement program</li> </ol>

*Post-Construction Storm Water Management in New Development and Redevelopment*

1. Modify and adopt the adjacent city's stormwater ordinance regarding stormwater quantity and quality requirements to require similar controls and requirements. Add a maintenance requirement for **BMPs** and detention designs
2. Transform the inspection process to be able to inspect and enforce the new ordinance
3. Communicate the new requirements
1. Investigate and seek to institute zoning and policy changes to encourage density restrictions, transferable development rights, easier use of **PUDs**, limitation of impervious areas, conservation easements, mandatory floodplain dedication, etc.
2. Develop design guidance for the use of structural and **non-structural BMPs**
3. Develop and conduct an ongoing training program in the proper use of **BMPs**
4. Develop several BMP pilot projects to demonstrate and gain experience in BMP use
5. Overhaul and develop a comprehensive storm water ordinance for both water quantity and quality which includes mandatory use of **BMPs** and a maintenance requirement
6. Establish inspection program for private **BMPs**
7. Develop a monitoring program for local surface waters and to monitor their long term changes
8. Develop master plans for areas facing new development and establish and enact policy for regional BMP design and maintenance
9. Develop ways to improve extra-territorial planning and zoning input
10. Identify key environmentally sensitive areas and take steps to protect such areas through ordinance, overlay districts, etc.
11. Seek to establish local watershed organizations and neighborhood adopt-a-stream programs to assist in compliance and build public support

*Pollution Prevention/Good Housekeeping for Municipal Operations*

1. Review all current municipal procedures and document ways to reduce pollution
2. Make changes and document
3. Obtain and distribute materials on ways to reduce pollution as available and appropriate.
1. Conduct an outside review of all applicable procedures and criteria and make recommendations for change, implement changes
2. Obtain available information and conduct sensitivity and familiarization training for all applicable city employees
3. Seek to control floatables partially through adopt-a-stream program (see public participation)
4. Review existing flood control projects to insure advantage is taken of pollution reduction opportunities in design and operation

Hours are given in most cases. Italicized numbers are one-time costs that are experienced some time in the first permit period, assumed to fill the year in which they initiate. For ongoing programs, the program initiates beginning in the next year. The annual costs are the anticipated costs thereafter. I have assumed that all programs initiate in year one for the total five-year cost estimate. Obviously if a program initiates in a later year there will be savings in annual costs not incurred until the program initiates. The five-year total is four times the annual cost plus the initial cost -- making a total of five years. Some programs are five-year programs only, ending after the first cycle.

A schedule of tasks and of manpower requirements is not developed in this paper. The costs are given as initial costs and as ongoing costs (clear from the context of the table). Because not all program elements will be developed and in-place for the whole permit term, there will be a ramp-up process. Also, most of the program elements will continue to change and evolve over time, and program costs will also change (up or down) in subsequent permit periods. Extraordinary volunteer efforts have not been assumed (e.g. writing news articles, manning a hotline, etc.).

It is important to realize that some per capita costs go down for large cities because they have a large fixed component. For example, it may cost the same to develop a one-page brochure whether the city has 20,000 or 200,000 people in it. Expenses are based on medium levels of effort wherever appropriate. Detailed expenses (e.g. long distance phone costs) have not been estimated.

Measurable goals have also not been provided in this handout. But for each BMP measure or program it will be necessary to develop some measurable standard by which to judge success. The standard may be based on internal activities where it cannot easily be based on external results. For example, sending out brochures three times per year can be measured. But, the effectiveness of those brochures can only be measured through phone surveys of public knowledge before and after the brochure was sent, or based on statistics on increased public participation in whatever program the brochure was about. Neither measure is easy and reliable. And, should a certain percent “effectiveness increase” be stated as the measurable goal, if it is not achieved the city would, technically, be out of compliance. Better to make the goal controllable, especially in the first permit cycles when little is known on the effectiveness of certain (especially non-structural) BMP measures.

In no case have the costs of structural BMPs been estimated or included. Cost estimates are available in several references including the Center for Watershed Protection (1997) and Northern Virginia Planning District Commission (1994). The economic benefits of structural BMPs are discussed in EPA (1995).

Monitoring costs are developed for Midtown based on both receiving stream monitoring and some pilot BMP program monitoring; they are non-existent for Smallville. EPA estimates that about 50% of permittees may incur monitoring costs in subsequent permit cycles. It is also assumed that there are no TMDL or other types of watershed assessment actions going on in the watershed which may radically modify the permit conditions, and that there are no regional or state-wide programs which could simply be adopted by reference for portions of the NPDES minimum requirements.

## Summary Results

The summary results of the analysis are presented in Table 3, in terms of cost per capita, for each of the programs in a manner comparable to the EPA estimates.

The range of results is similar to that experienced by EPA in making its original estimates of the cost of the Phase II program. The details of this program development can assist a local community in fashioning its own stormwater program in response to the regulations.

Table 3. Summary Results

Minimum Control	Annual Per-Capita Cost	
	Small	Midtown
<b>First 5-year Permit Period</b>		
1 - Public Ed.	0.39	1.24
2 - Public Inv.	0.21	0.62
3 - Illicit Connections	0.24	1.77
4 - Construction	0.20	0.96
5 - Post Const.	0.14	5.78
6 - Housekeeping	0.15	0.59
<b>Totals</b>	<b>1.33</b>	<b>10.96</b>
<b>Subsequent 5-year Permit Periods</b>		
1 - Public Ed.	0.36	1.40
2 - Public Inv.	0.24	0.51
3 - Illicit Connections	0.10	1.16
4 - Construction	0.18	1.10
5 - Post Const	0.13	1.26
6 - Housekeeoina	0.10	0.20
<b>Totals</b>		<b>5.63</b>



## **The Phase II Action Plan**

Given the great range in costs for the Phase II program it makes sense to get a jump start on planning for it. Many of the requirements or potential inter-local arrangements that could be developed take time to implement, more time than is available if the community waits until the general permit has been finalized and the NOI is due. There are steps that a local government should take now to prepare itself for the regulations and to position itself to meet compliance in the most cost-effective manner. These steps can be performed as part of a Phase II action plan:

### **1. Assess your status**

Ask yourself if you are “in,” “potentially in,” or “out.” Find out who else is in your category.

### **2. Get to know the permit writers**

Find out what the permit writers are thinking about the permits, what the general permit will look like, when you will know more, how they will evaluate those potentially in, what other actions are going on in the state that may impact the permit, etc. Find out their ideas about what is important in the permit, what their special interests are, do they strongly support the permit, etc. Plan to establish an ongoing dialog.

### **3. Assess your surface waters**

Find out if there are any ongoing actions which might designate surface waters in your jurisdiction as not meeting water quality standards. See if there are any planned watershed assessments or TMDL requirements coming in the future.

### **4. Assess your own program**

How much of your own stormwater program looks like the regulations, even with some minor modifications. Can you get a jump on the requirements through transformation of your current programs?

### **5. Check out your neighbors**

Are there some other programs nearby that might result in savings to you? Can you simply be covered under another program? Can parts of the requirements be waived because they are already being done by someone else? Can you plan to be part of a regional permit? Can you split the permit requirements with an adjacent entity and perform them together at savings to both of you?

### **6. Get a team together**

Once you have answered some of these questions, it is time to pull the action team together. This may include only your own staff, a multi-disciplinary staff within your own jurisdiction, or a multi-jurisdictional or regional team. Get together to brainstorm and come up with a proposal to the permit writer which has mutual benefits. Remember, permit writers are being encouraged to think regionally and on a watershed basis.

### **7. Develop an action plan**

Once you have a team, it is time to have a plan. Begin to formulate what you will need to do to apply for the permit and to carry it out. What might your program minimums look like? Are there some things you can do now, over several years, that you cannot afford to do in any one year, or that will take too long to get going if you wait until the permit is upon you? Can you begin the program transformation process now? What about data collection and mapping? Are there other uses for any data you will collect which will create synergy?

## **8. Get started**

Some things are best started early. But do not jump the gun by committing resources in areas that are not yet anticipated to be firm. Ask the permit writer for his or her opinion.

### **References**

Center for Watershed Protection, 1997, *The Economics of Stormwater BMPs in the Mid-Atlantic Region*, August.

The National Association of Flood and Stormwater Management Agencies (NAFSMA), 1999a, *Phase II Survey Raw Data Report*, 1299 Pennsylvania Ave. NW, Washington DC, 20004.

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Northern Virginia Planning District Commission, 1994, *Urban Retrofit Techniques: Applicability, Costs, and Cost-effectiveness*, November.

United States Environmental Protection Agency, 1995, *Economic Benefits of Runoff Controls*, EPA 841-S-95-002, September.

United States Environmental Protection Agency, 1999, *Report to Congress on the Phase II Stormwater Regulations*, EPA 833-R99-001, October.

## Appendix

Table 2. Hypothetical Program Detail and Cost Summary

Program Element	Smallville cost	Program Element	Midtown cost
<i><u>Public Education and Outreach on Stormwater Impacts</u></i>			
Acquisition of available mailers and information from private institutions and other governmental entities - 20 hrs	\$1,000	Acquisition of available mailers and information from private institutions and other governmental entities - 40 hrs	\$2000
<b>Keep up with available literature - 20 hrs/yr</b>	<b>\$1000/yr</b>	<b>Keep up with available literature - 50 hrs/yr</b>	<b>\$2500/yr</b>
Coordination with neighborhood or shoppers newspaper to run articles on pollution sources - 4 hrs	\$200	Stratified mailing database development for key stakeholder groups - commercial, automotive, minority, etc. - 100 hrs	\$5,000
<b>Develop 2 articles per year - 24 hrs/yr</b>	<b>\$1,200/yr</b>	<b>Maintenance of database - 1 hr/wk</b>	<b>\$2,600/yr</b>
Coordination with the few individual potential sources of pollution about the program and their needs - 10 hrs	\$500	Obtaining or developing educational materials for the specific outreach and stakeholders' programs, printing - 30 hr	\$4,000
		Updating materials - 100 hrs/yr. Mailing 5,00 brochures per year	<b>\$7,500/yr</b>
Series of three mailings - stuffers in utility bill	\$3,600	Developing outreach and educational programs - 200 hrs	\$10,000
One mailing per year afterward	\$1,050/yr	Executing programs - updating, mailing, training, presentations - 200 hrs/yr	<b>\$12,000/yr</b>
Responding to information requests - 1/2 hr/wk	\$1,300/yr	Develop elementary and middle school education programs - preexisting Material/curriculum - free materials - 100 hrs	\$5,000
		Ongoing program maintenance - refresher training, 5 schools - 100 hrs/yr	<b>\$5,000/yr</b>
		Advertising of hotline - radio spots developed in-house and on public And other radio service spots and Newspaper ad, 3 times per year - 140 hrs - donated spots	<b>\$12,000/yr</b>
		Develop white paper and press package - initial, brief - 32 hrs	\$1,600
		Develop quarterly press package/briefing - brief press - 24 hrs per + expenses	<b>\$5,000/yr</b>
		Development of a short, scripted stormwater pollution slide show, Presentation and speakers bureau & initial presentation - 60 hrs	\$3,000
		Give presentations - 48 hrs/yr + expenses	<b>\$2,600/yr</b>
		General informational brochure development and mailing - once/year - 60 hrs/yr - 25,000 inserts @ 0.50 per	<b>\$15,500/yr</b>

Continued

Table 2. Cont.

Program Element	Smallville	cost	Program Element	Midtown	cost
			Responding to information requests - 2 hrs/wk		\$5,200/yr
	Initial Cost	\$5,350		Initial Cost	\$30,600
	Annual Cost	\$4,550		Annual Cost	\$69,900
	Total Cost (first 5 years)	\$23,500		Total Cost (first 5 years)	\$310,200
	Total Cost (ongoing 5 -year period)	\$22,750		Total Cost (ongoing 5-year periods)	\$349,500
<i>Public Involvement/Participation</i>					
Development and implementation of a citizen advisory committee appointed by the mayor - 2 initial meetings - 14 hrs		\$700	Development and implementation of a citizen advisory committee appointed by the council - 5 initial meetings - 70 hrs + expenses		\$3,700
Quarterly meetings - 32 hrs/yr		\$1,600/yr	Bimonthly meetings - 60 hrs/yr		\$3,000/yr
Advertisement of the larger city's stream cleanup program in local shopper newspapers - news articles, and coordination with them in all such programs - 16 hrs/yr		\$800/yr	Initial coordination of monitoring program and/or adopt-a-stream - 60 hrs - equipment purchase		\$40,000
			Ongoing coordination and equipment, database maintenance - 100 hrs/yr + expenses		\$15,500/yr
			Student storm drain stenciling program development and implementation - 80 hrs		\$6,500
			Annual cost		\$3,000
NOTE: italics are initial cost - for first year only			Watershed group encouragement - presentations, advertising - 50 hrs + expenses		\$2,800
			Ongoing coordination, education - 4 groups - 20 hrs. per		\$4,000/yr
	Initial Cost	\$700		Initial Cost	\$53,000
	Annual Cost	\$2,400		Annual Cost	\$25,500
	Total Cost (first 5 years)	\$10,300		Total Cost (first 5 years)	\$155,000
	Total Cost (ongoing 5 -year period)	\$12,000		Total Cost (ongoing 5-year periods)	\$127,500
<i>Illicit Discharge Detection and Elimination</i>					
Collect and plot field information on system locations and sizes - 5 hrs - contract		\$7,000	Develop system map, perform inventory of major structures - 60 hrs + contract		\$150,000
			Update map - 60 hrs		\$3,000/yr
Adopt ordinance - 20 hrs		\$1,000	Database development and GIS programming and mapping - 200 hrs + expenses of \$3k		\$13,000
Enforcement of ordinance - 20 hrs/yr		\$1,000/yr	Database maintenance - 100 hrs		\$5,000/yr

Continued

Table 2. Cont

Program Element	Smallville	cost	Program Element	Midtown	cost
			Ordinance development with public participation - contract		\$20,000
			Initial dry-weather screen in parts of city - student volunteers - 240 hrs		\$12,000
			One staff member 1 day/week for inspection and enforcement of Illicit connection program - + expenses		\$28,000/yr
			Development of automotive or other specialty programs - 100 hrs + 1k exp.		\$6,000
			Annual implementation of inspection and education - 1 day/wk		\$22,000/yr
	Initial Cost	\$8000		Initial Cost	\$201,000
	Annual Cost	\$1,000		Annual Cost	\$58,000
	Total Cost (first 5 years)	\$12,000	Total Cost (first 5 years)	\$433,000	
	Total Cost (ongoing 5 -year period)	\$5,000	Total Cost (ongoing 5-year periods)		\$290,000
<i>Construction Site Stormwater Runoff Control</i>					
Modify and pass new erosion control ordinance - 40 hrs		\$2,000	Modify existing ordinance - public participation - 60 hrs		\$3,000
Enforcement ordinance in inspection process - 50 hrs/yr		\$2,500/yr			
Modify development procedures - 4 hrs		\$200	Add BMP section to design manual - 140 hrs + printing cost		\$12,000
Train secretary to handle calls - 8 hrs		\$800	Conduct training sessions for staff and local development related persons - 80 hrs		\$4,000
Handle erosion calls - 10 hrs/yr		\$500/yr	Ongoing biannual training - 32 hrs/yr		\$1,600/yr
			Develop hotline procedure for complaints reception - 10 hrs		\$500
			Hotline @ 150 hrs/yr + expenses		\$8,500/yr
			Upgrade erosion control program for more sites and more activities - one person two days/wk + expenses		\$45,000/yr
	Initial Cost	\$2,600		Initial Cost	\$19,500
	Annual Cost	\$3,000		Annual Cost	\$55,100
	Total Cost (first 5 years)	\$14,600	Total Cost (first 5 years)		\$239,900
	Total Cost (ongoing 5 -year period)	\$15,000	Total Cost (ongoing 5-year periods)	\$275,500	
<i>Post-Construction Stormwater Management in New Development and Redevelopment</i>					
Modify and get ordinance passed - 40 hrs		\$2,000	Work on major policy changes in land use regulations - contract + 200 hours		\$100,000
Enforce/explain new ordinance provisions - 1/2 hr/wk		\$1,300/yr	Develop design guidance for BMPs - contract		\$25,000
			Training program for BMP use - debvelopment - 24 hrs + contract		\$3,000
			Annual training - 60 hrs/yr		\$3,000/yr

Continued

Table 2. Cont.

Smallville		cost	Midtown	
Program Element			Program Element	cost
			BMP Pilot projects - federal funding assistance - 5-year program - contract	\$200,000 5 yrs
			Comprehensive stormwater ordinance with public participation - contract	\$40,000
			BMP inspection and enforcement program - one person one day/wk + expenses	\$25,800/yr
			Data collection program - SWAG	\$30,000/yr
			Master planning for new areas for both quality and quantity - 2 mile Planning zone around -c5-year program -40 mi <sup>2</sup>	\$800,00 5 yrs
			Costs of administration of regional BMP program - SWAG	\$4,000/yr
			Sensitive area identification program, ordinances and policy enactment- 5-year program - 100 hrs incl. Mapping	\$25,000 5 yrs
	Initial Cost	\$2,000	Initial Cost	\$393,000
	Annual Cost	\$1,300	Annual Cost	\$62,800
	Total Cost (first 5 years)	\$7,200	Total Cost (first 5 years)	\$644,200
	Total Cost (ongoing 5 -year period)		Total Cost (ongoing 5-year periods)	\$314,000
			Master planning	
<i>Pollution Prevention/Good Housekeeping fo Municipal Operations</i>				
		\$2,000	Review and modification of all applicable procedures and criteria contract	\$25,000
		\$500	Site inspections and corrections - 5-year program - \$5k/yr	\$25,000 5 yrs
		\$1,000/yr	Training for city employees on new procedures - 40 hrs + 10 hrs @ 75 persons + expenses	\$42,000
			Review flood control projects for retrofit opportunities - contract	\$15,000
			Annual cost of changed procedures - SWAG	\$10,000/yr
T	Initial Cost	\$2,500	Initial Cost (without master planning)	\$107,000
O	Annual Cost	\$1,000	Annual Cost	\$10,000
T	Total Cost (first 5 years)	\$6,500	Total Cost (first 5 years without master planning)	\$147,000
A	Total Cost (ongoing 5 -year period)	\$5,000	Total Cost (ongoing 5-year periods)	\$50,000
L			Master planning	\$800,000
T	Initial Cost	\$21,500	Initial Cost (without master planning)	\$804,100
O	Annual Cost	\$13,250	Annual Cost	\$281,300
T	Total Cost (first 5 years)	\$74,150	Total Cost (first 5 years without master planning)	\$1,929,300
A	Total Cost (ongoing 5 -year period)	\$66,250	Total Cost (ongoing 5-year periods)	\$1,406,500
L			Master planning	\$800,000