Morris County Planning Board

Recommendations for Stormwater Utility Implementation in New Jersey

September 2005

Summary Report

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October 6, 2005

Mr. Raymond Zabihach
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Morris County Planning Board
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Subject: Summary Report

Dear Mr. Zabihach:
CDM is pleased to transmit the final Summary Report on Recommendations for Stormwater Utility Implementation in New Jersey.

The Summary Report contains two important appendices:

- Potential Changes in NJ Law That Support Stormwater Utility Services. This appendix presents several recommendations for changes in New Jersey laws and regulations to improve the ability of government entities and utilities to create stormwater utilities.

- Guidance for Stormwater Utility Implementation: Greentown Borough. This appendix is essentially a detailed "how to" guide for implementing entities, that walks through many of the key administrative, analytical, and financial steps involved in creating a successful stormwater utility.

We are very excited about potential enhancements in NJ law and regulations that could improve the ability to implement stormwater utilities. Our national expertise provides an excellent backdrop against which lessons learned elsewhere can benefit New Jersey. If there is anything else we can do to advance this valuable initiative, please do not hesitate to call upon us.

Sincerely,

William E. Cesanek, AICP
Vice President
Camp Dresser & McKee Inc.

enclosure: 10 copies of the Recommendations for Stormwater Utility Implementation report

Contents

Recommendations for Stormwater Utility Implementation in New Jersey

1. Introduction

This summary report recommends three actions that would significantly facilitate the implementation of Stormwater Utilities in New Jersey. The recommended actions draw on the project study tasks, including a literature review, a review of experiences in other states (lessons learned), a legal analysis, and a study of user cost assessment methods.

The recommendations presented herein would advance the creation and operation of Stormwater Utilities by local and regional governments and government agencies (including municipal, county, and regional utility authorities).

The first general recommendation is for legislative and/or regulatory action to create, extend and clarify the basis of authority, and the powers, of a Stormwater Utility. Legislative action is recommended to (1) expand the enabling authority in New Jersey so as to allow stormwater utilities to be implemented under existing water, wastewater, and flood control laws; and (2) to explicitly authorize municipalities and counties, municipal and county utility and improvement agencies, and municipal and county utility authorities, to collect user service fees, make stormwater system improvements, and provide operation and maintenance services for stormwater infrastructure.

> Recommended Actions: Amend existing NJ legislation to explicitly allow the formation of stormwater utilities by an individual municipality, groups of municipalities, counties, or regional government agencies. Modify legal authorities including both general government and utility authority powers to allow provision of stormwater utility functions, including the ability to establish a secure source of revenue; to perform construction, operation, maintenance, and administrative functions; and specify that stormwater user fees must be proportionally allocated based upon factors that represent the amount of stormwater runoff that is contributed by properties.

The second general recommendation is that state agencies provide guidance for successful implementation of a Stormwater Utility to local governments, local government agencies, and utility authorities interested in creating a utility. Over 30 states allow for creation and operation of Stormwater Utilities, and over 400 Stormwater Utilities have been created and are operating throughout the country. This extensive

experience has yielded a process for planning and implementing stormwater utilities that has demonstrable success. Following a "model planning and implementation process" will optimize the operational effectiveness and improve public understanding of a proposed stormwater utility's purpose and functions. Guidance in the form of agency assistance and documentation is vital to successful implementation.

> Recommended Action: Municipalities and counties appear to have the authority to create stormwater utilities at present, under their general powers, but no guidance and direction appears to be available from state agencies for those choosing to do so. To date, no municipality or county in New Jersey has attempted to create a Stormwater Utility. This study has shown that state agencies are not yet prepared nor is there adequate coordination between Departments to guide local stormwater utility implementation efforts. State agencies should prepare and distribute guidance to local entities for successful Stormwater Utility implementation, such as the model implementation process provided as part of this project.

The third general recommended action is for state agencies to identify a model user service fee system that can be implemented to fund stormwater management. A model user fee system has been presented as part of this project that has been shown to be equitable, with tested legal defensibility. To avoid local adoption of stormwater utility fee systems that have not been successful elsewhere in the country, the State should specify a model fee system to local governments wishing to create a Stormwater Utility.

> Recommended Action: State agencies should recommend a specific method(s) for establishing effective and defensible user fee structures for Stormwater Utilities. Such methods must provide a rational nexus for Stormwater Utility fees, and they must be experience-tested. State agencies should prepare and distribute guidance to local entities on this topic. Specifically, such guidance needs to identify a system that connects the fee charged to the general amount of impervious surface on a property that generates stormwater runoff.

The second and third recommendations would result in state agencies offering guidance and support to help assure successful implementation of Stormwater Utilities. It is recommended that the many state agencies involved in regulating and promoting stormwater management (NJDEP, NJDOT, NJDCA, NJ Dept. of Agriculture, etc.) each participate in a "coordinating committee" to communicate to their user communities the best practice methods for creating and operating a Stormwater Utility.

Making available the wealth of experience from Stormwater Utilities around the country and making available "best practice" methods will help local and regional entities implement effective, defensible, and well-managed stormwater utilities, including collecting revenue using an equitable and consistently-applied user fee system.

Three recommended actions are presented for NJDEP's consideration.

Each of these three key recommendations is discussed further in the following sections. In essence, the function of a stormwater utility must be well defined, it must be granted commensurate authority, and it must be adequately funded.

2. Expand Enabling Authority to Create Stormwater Management Utilities in NJ

2.1 Evaluation of Existing Laws

New Jersey has many laws and regulations designed to manage water resources, and, specifically, water quality. The Stormwater Utility Study has evaluated whether existing laws and regulations are sufficient to facilitate the creation of stormwater utilities by asking the following two questions:

1. To what extent do the existing laws and regulations provide an adequate legal structure for implementation of proactive stormwater management by local governments, local government agencies, and utility authorities?

2. To the extent the existing laws and regulations do not provide an adequate legal structure for implementing proactive stormwater management, how could the inadequacies of the current structure be remedied?

2.2 Key Regulatory Elements

A legal structure for implementation of stormwater management utilities should meet the objectives listed below. CDM evaluated New Jersey laws and regulations that were potentially applicable to the process of implementing stormwater utilities. The following analysis, supplemented by Table 1, summarizes the results of the evaluation.

1. *Establish clear criteria, standards and procedures for implementation and stormwater management systems.*

Only the stormwater management rules in NJAC 7:8 establish clear criteria, standards, and procedures for implementation and maintenance of stormwater management actions as associated with new development. The Stormwater Management Act (NJSA 40:55D-93 et seq.) establishes the general objectives on which the criteria, standards and procedures in the rules are based. The municipal stormwater permitting rules in NJAC 7:14A provide minimum standards for the operation and maintenance of municipal stormwater systems, but much more information is available from Stormwater Utility practice nationwide.

2. *Facilitate implementation, operation and maintenance of stormwater systems by a variety of legal entities (municipalities, counties, authorities, and regional commissions) to create the greatest possible opportunity to form stormwater utilities.*

Table 1
Features of Existing New Jersey Statutes and Regulations Relevant to Implementation of Stormwater Utilities

Law or Regulation	Specifically addresses stormwater	Establishes standards, criteria and procedures for stormwater BMPs	Provides for project-specific assessments on benefited properties or parties	Provides a reliable, ongoing source of operating funds	Gives responsible entities authority to expend funds as necessary	Authorizes issuance of bonds to finance capital improvements	Facilitates action by a variety of legal entities					
							Municipalities	Counties	Authorities	Regional entities	State	Other
Local Bond Law (NJSA 40A:2-1 et seq.)	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Municipal and County Sewerage Act (NJSA 40A:26A-1 et seq.)	No	No	Yes (on properties)	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Municipal public utilities (NJSA 40:62-1 et seq.)	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	Water districts
Municipal and County Utilities Authority Law (NJSA 40:14B-1 et seq.)	No	No	No	Yes	Yes	Yes	No	No	Yes	No	No	No
County Improvement Authorities Law (NJSA 40:37A-44 et seq.)	No	No	No	Yes	Yes	Yes	No	No	Yes	No	No	No
Sewerage Authorities Law (NJSA 40:14A-1 et seq.)	No	No	No	Yes	Yes	Yes	No	No	Yes	No	No	No
Municipal & County Flood Control Financing Act (NJSA 40A:27-1 et seq.)	Yes	No	Yes (on properties)	No	Yes	Yes	Yes	Yes	No	Yes	No	No
NJ Environmental Infrastructure Trust Act (NJSA 58:11B-1 et seq.)	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
New Jersey Wastewater Treatment Public-Private Contracting Act (NJSA 58:27-19 et seq.)	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stormwater Management Rules (NJAC 7:8)	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	Yes	SCDs
NJPDES regulations (NJAC 7:14A)	Yes	No	No	No	No	No	No	No	No	No	Yes	No
Soil Erosion & Sediment Control Act (NJSA 4:24-40 et seq.)	Yes	No	No	No	No	No	No	No	No	No	Yes	SCDs
Stormwater Management Act (NJSA 40:55D-93 et seq.)	Yes	Criteria only	No	No	No	No	Yes	No	No	No	No	No
Joint Flood Control Commissions (NJSA 40:14-16 et seq.)	Yes	No	No	No	No	No	Two or more	Yes	No	Yes	No	No
Local and other improvements (NJSA 40:56-1 et seq.	Yes	No	Yes (on properties)	No	NA	No	Yes	Yes	No	No	No	No
Water Quality Planning Act (NJSA 58:11A-1 et seq.)	Yes	No	No	No	No	No	No	No	No	No	Yes	Planning agencies
State Flood Control Facilities Act (NJSA 58:16A-1 et seq.)	Yes	No	No	No	Yes	No	No	No	No	No	Yes	No

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							Municipalities	Counties	Authorities	Regional entities	State	Other
Flood Hazard Area Control Act (NJSA 58:16A-50 et seq.)	Yes	No	No	No	No	No	Yes	Yes	No	No	Yes	No
Sewage Infrastructure Improvement Act (NJSA 58:25-23 et seq.)	Yes	No	No	No	No	No	Yes	Yes	Yes	No	No	No
Watershed Protection and Management Act of 1997 (NJSA 58:29-1 et seq.)	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No
County Planning Act (NJSA 40:27-1 et seq.)	Yes	No	No	No	No	No	No	Yes	No	No	No	No
Municipal Land Use Law (NJSA 40:55D-1 et seq.)	Yes	No	Yes (on developers)	No	No	No	Yes	No	No	No	No	No
Consolidated Municipal Service Act (NJSA 40:48B-1 et seq.)	No	No	No	No	NA	Yes	Yes	Yes	No	Yes	No	No
Opening and keeping open waterways (NJSA 40:14-1 et seq.)	No	No	Yes (on properties)	No	Yes	Yes	Yes	Yes	No	Yes	No	No
Intermunicipal sewer contracts (NJSA 40:63-68 et seq.)	No	No	Yes (on properties)	No	Yes	Yes	Yes	No	No	No	No	Joint meetings
General municipal powers (NJSA 40:48-2)	No	No	No	No	NA	No	Yes	No	No	No	No	No
Municipal ordinances and resolutions (NJSA 40:49-1 et seq.)	No	No	No - provides for objections	No	NA	No	Yes	No	No	No	No	No
The Realty Improvement Sewerage and Facilities Act (NJSA 58:11-23 et seq.)	No	No	No	No	No	No	No	No	No	No	No	Boards of Health
Sewerage Facilities Aid Program (NJSA 58:25-1 et seq.)	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No
Department of Public Utilities Act of 1948 (NJSA 48:2-1.3 et seq.)	No	No	No	No	No	No	No	No	No	No	Yes	No
Interlocal Services Act (NJSA 40:8A-1 et seq.)	No	No	No	No	No	No	Two or more	No	No	No	No	No
Local Budget Law (NJSA 40A:4-1 et seq.)	No	No	No	No	NA	No	Yes	No	No	No	No	No

Streets are the source of a substantial portion of the pollution in stormwater, and are a conduit for additional pollution that originates on properties along the streets. Because municipalities have jurisdiction over most streets, it is particularly important for municipalities to have the ability and the authority to manage stormwater. Because counties typically have jurisdiction over many major, heavily traveled roads, they also need to be able to implement stormwater management programs. Because many (although certainly not all) municipalities and counties are accustomed to acting through authorities, a legal structure for implementation of stormwater systems should provide for implementation by authorities. At the same time, certain stormwater management approaches might be most effectively planned, designed, implemented, and maintained on a regional scale, because watersheds are a regional phenomena. The legal structure should therefore provide for stormwater management by regional entities.

Only three of the laws reviewed--the New Jersey Environmental Infrastructure Trust Act (NJSA 58:11B-1 et seq.), the New Jersey Wastewater Treatment Public-Private Contracting Act (NJSA 58:27-19 et seq.), and the Sewerage Facilities Aid Program (NJSA 58:25-1 et seq.)--facilitate action by municipalities, counties, authorities and regional entities. Of these, the Wastewater Treatment Public-Private Contracting Act has no direct relationship to stormwater management, and the Sewerage Facilities Aid Program makes no reference to stormwater. The Environmental Infrastructure Trust Act provides for loans of state funds to finance stormwater infrastructure, but does not address the issue of how to pay back the loans through a user fee system.

3. *Give entities responsible for implementation and maintenance of stormwater systems the authority to expend funds as necessary to meet that responsibility.*

4. *Authorize issuance of bonds to finance capital improvements.*

5. *Provide a reliable, ongoing source of operating funds that is related to the stormwater services provided and is insulated from political and economic changes to a degree at least equivalent to existing water supply and wastewater utility functions.*

To implement stormwater management, the implementing entity must have a source of funds and authority to expend the funds. To raise money for large projects, the implementing entity needs authority to issue bonds. Issuance of bonds is a form of borrowing, and borrowed funds must be paid back. A source of funds is required to pay back the borrowed money. In addition, for ongoing operation and maintenance of stormwater systems, a reliable, ongoing source of funds is needed.

Problematic Funding Approaches. Funding stormwater management projects through taxation is vulnerable to unpredictable political and economic change. User fees *based on property value* are generally inequitable because the value of a property often has little relationship to the amount of stormwater runoff from the property. This is also true of ad valorem taxes. Project-specific assessments on benefited properties or parties do not provide permanent funding for long-term operation and maintenance of stormwater systems. Also, basing user fees on property value creates no incentive to design properties for reduced runoff.

Recommended Funding Approach. Funding through user fees, based on the amount of impervious surface that generates stormwater runoff, is relatively insulated from political and economic change. User fees provide flexibility with respect to managing the scope and schedule of stormwater management construction projects, and operation and maintenance actions. The user fee funding approach has exhibited the greatest effectiveness and defensibility throughout the country. User fees should be based on "rational nexus" factors for which data can be assembled, and that are related to runoff volume and degree of contamination flowing from a parcel. One standard basis of a user fee is a parcel's impervious surface area. User fees based on factors related to runoff volume and potential for water quality impairment create an incentive to reduce those factors.

NJ Laws with Potential to Enable Stormwater Utility Functions

Six of the laws reviewed--the first six laws listed in Table 1--provide for long-term funding through user fees. These six laws also provide for issuance of bonds to finance capital improvements. However, only one of the six laws, the Local Bond Law, specifically addresses stormwater, and the only reference to stormwater in the Local Bond Law is the 40-year term limit on bonds to finance stormwater systems. Three of the six statutes authorize action by municipalities, two authorize action by counties, and three authorize action by authorities. (Note: Authorities are formed by municipalities and counties.) The Municipal and County Sewerage Act, NJSA 40A:26A-1 et seq., authorizes action by groups of municipalities, groups of counties, or mixed groups of municipalities and counties. Regional utilities can be established under this law.

The Local Bond Law, NJSA 40A:2-1 et seq., authorizes municipalities and counties to issue bonds to finance capital improvements and utility operations, among other things (NJSA 40A:2-3). It appears that the Local Bond Law, in its current form, empowers municipalities and counties to establish self-liquidating utilities (i.e., utility districts, rather than utility authorities) to finance the implementation and long-term operation and maintenance of stormwater management facilities, but this apparent authority to create and operate a stormwater utility has not been tested in

NJ. While apparently authorizing user fees, the Local Bond Law does not address the issue of what factors should be considered in setting user fees.

The Municipal and County Sewerage Act, NJSA 40A:26A-1 et seq., authorizes municipalities, groups of municipalities, counties, or groups of counties to construct and operate "sewerage facilities," defined essentially as structures for management of wastewater and sewage sludge. It appears that the Municipal and County Sewerage Act, with minor changes, could facilitate implementation and long-term maintenance of stormwater management facilities by municipalities, counties, and regional entities constructed of multiple municipalities and/or counties. Because many people do not view stormwater management as a service, the definition of "sewerage facilities" would have to be modified to include stormwater management facilities.

NJSA 40:62-96 et seq. authorizes municipalities to create water districts to construct, operate, and maintain water supply systems. Because this law deals specifically with water supply rather than with any type of discharge management, it is not an appropriate candidate for modification to facilitate stormwater management.

The Municipal and County Utilities Authority Law (MCUAL), NJSA 40:14B-1 et seq., authorizes municipalities, groups of municipalities, and counties to form municipal authorities to construct, operate and maintain "works" for management of "solid wastes" and "sewage or other wastes" (NJSA 40:14B-2(1); see also NJSA 40:14B-19). With modifications, the MCUAL could facilitate implementation and long-term maintenance of stormwater management facilities.

The Sewerage Authorities Law, NJSA 40:14A-1 et seq., predates, and is very similar to the MCUAL; newer authorities tend to be formed under the MCUAL rather than the Sewerage Authorities Law. However, the Sewerage Authorities Law does allow municipalities and counties to work together in almost any combination. This law governed the creation of many existing Authorities, and would need to be modified to allow stormwater utility functions for authorities created under it.

The County Improvement Authorities Law, NJSA 40:37A-44 et seq., authorizes counties to create "improvement authorities" for the purpose of providing public facilities (NJSA 40:37A-46&54). The County Improvement Authorities Law could be modified to facilitate implementation and long-term maintenance of stormwater management facilities.

2.3 Options for Creating an Adequate Legal Structure

Our review of the many laws and regulations that are relevant to the creation and operation of stormwater utilities indicates that the existing institutional arrangements relating to water, wastewater, and stormwater utility functions in NJ are highly complex and often convoluted, and seriously complicate the process and opportunity to implement stormwater utilities. Either existing law requires modification to support implementation and operation of stormwater utilities, or new legislation needs to be created. Because modification of existing law appears to have greater potential for success, a range of options are presented for consideration, below.

As noted above, the stormwater management rules at NJAC 7:8 (for new development) and the municipal stormwater permitting rules in NJAC 7:14A (for existing municipal systems) are the only sources in New Jersey law or regulation that offer criteria, standards, and procedures for implementing and maintaining stormwater management facilities. When amending existing laws and regulations to include funding and implementation of stormwater utility functions, the amending text should reference the stormwater management rules rather than duplicating or supplementing their contents. These recommended statutory changes focus on creating an equitable, cost-effective, and efficient utility for management of stormwater systems, rather than seeking to modify the technical standards for stormwater systems and their operation.

A statutory structure is needed that serves the other four functions listed in Section 2.2 (functions 2 through 5). Three options for creating enabling authority in NJ were evaluated. Each option, below, is followed by commentary regarding the relative advantages and disadvantages of that option.

1. *Enactment of a new law that serves functions 2 through 5 listed in Section 2.2.*

If an entirely new law were created solely to facilitate implementation of stormwater management, it could be optimized to be maximally effective in enabling the full range of desired functions. However, such an approach would not take full advantage of the familiarity of municipalities, counties and existing authorities with existing laws. In addition, when new laws appear to duplicate the functions of existing laws it can be difficult to secure support for passage of the proposed law.

2. *Modification of a single law that currently provides for user fees and bond issuance to specifically address stormwater and to facilitate action by a variety of legal entities.*

Modification of one existing law would leverage the existing familiarity with that law, but the ability to extend the authorization provided by the law to more than one type of legal entity would likely be constrained.

3. *Modification of two or more laws that currently provide for user fees and issuance of bonds to specifically address stormwater, and modification of one of the laws to facilitate action by regional entities.*

This study recommends modification of several existing laws to allow the proposed stormwater functions to be undertaken by the widest possible range of implementing entities (or combination of implementing entities, potentially sharing responsibilities within a watershed or region), using existing water, wastewater, and improvement utility laws.

If the State or Legislature might wish to consider creating new stormwater utility entities for stormwater management, the preferred type of entity to be authorized to be created would be implemented at a watershed or regional level. There are potentially significant economies-of-scale and efficiencies that could be achieved by implementing stormwater utility functions at a watershed or regional scale. Table 2 identifies the advantages and disadvantages of 5 different types of institutional entities that might serve the Stormwater Utility function.

Each of the laws should also be modified to specify that stormwater system user fees must be based on the stormwater runoff contribution from each parcel (following the example of Virginia). In the case of the Local Bond Law, NJSA 40A:2-1 et seq., this is the only modification that would be required.

Modifications to several laws are suggested below.

Language should be added to NJSA 40 that authorizes municipalities to establish stormwater utilities by ordinance. The authorizing language should reference the municipal budgeting requirements in NJSA 40A-4. This provision would apply where the municipality intends to operate its stormwater systems as part of municipal government, but prefers a funding mechanism independent of the ad valorem tax.

The Municipal and County Sewerage Act, NJSA 40A:26A-1 et seq., should be modified to include stormwater management functions. Because many people do not view stormwater management as a service, it would also be helpful to either expand the definition of "sewerage services" to include provision and maintenance of stormwater facilities, or to define and authorize stormwater management services separately within the Act.

The Municipal and County Utilities Authority Law (MCUAL), NJSA 40:14B-1 et seq., should also be among the laws modified. The preferred approach would be to add stormwater-specific provisions to the law rather than to expand the coverage of the sewage-specific provisions. The needed modifications would be structurally similar to those made in 1977 to authorize municipal authorities to manage solid waste.

The County Improvement Authorities Law, NJSA 40:37A-44 et seq., should be modified to specifically authorize implementation of stormwater management functions and provide for imposition of user fees to finance construction, operation and maintenance of stormwater management facilities.

In each case, the statutory changes should:

- state a rationale for management of stormwater services through the respective entity (general government or utility authority),
- identify the general nature of stormwater functions that can be addressed, and,
- identify the general method by which fees must be based on the proportional impact of properties on total stormwater management costs, as determined through definition of the type and the level of services to be provided.

These provisions should be general in nature, to allow for evolution of stormwater services based on changes in statutes, regulations and local needs. In addition, the statutory cases should require state agency development of guidance (rather than regulations) regarding successful stormwater utility implementation and defensible user fee structures.

3. Stormwater Utility Implementation

The basis for a complete funding mechanism for stormwater management services is founded on the objectives and opportunities for addressing the community's needs. Community needs range from resolving stormwater management issues arising from existing development to anticipating approaches to address the runoff from future growth. These concepts and recommendations are more detailed than would be appropriate for inclusion in the recommendations for statutory changes outlined in Section 2, but are vital to program success. In this section we have identified best-of-practice approaches employed throughout the country to identify the mission and workplan for a stormwater utility that will be useful and successful.

3.1 Regulatory Drivers for Utility Creation in NJ

The need to allow the creation of stormwater utilities in NJ arises from the functions and responsibilities given to local governments for stormwater management under federal law (Clean Water Act). The NJDEP web site "Stormwater Management Rules -- Frequently Asked Questions" presents an excellent overview of the new 2004 stormwater management requirements in NJ, as excerpted below. Existing and potentially expanded responsibilities held by local governments for stormwater management are likely to incur costs for stormwater management that could be funded equitably and efficiently through the creation of stormwater utilities. Current and future responsibilities, under the 2004 stormwater management rules, are described below.

The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program Rules (N.J.A.C. 7:14A), effective February 2, 2004, are intended to address and reduce pollutants associated with existing stormwater runoff. The Rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems known as MS4s. Under this program permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways.

The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning);

implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component. More information about this rule is available elsewhere on this website.

The NJ Stormwater Management Rules (N.J.A.C. 7:8), effective February 4, 2004, set forth the required components of regional and municipal stormwater management plans, and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development includes groundwater recharge, runoff quantity controls, runoff quality controls, and Category One buffers. Provisions of the NJ Stormwater Management Act Regulations, at N.J.A.C. 7:8 relating to the need to allow for creation of Stormwater Utilities, include:

> 7:8-1.5 Relationship to other regulatory programs
> (a) Nothing in this chapter shall be construed as preventing the Department or other agencies or entities from imposing additional or more stringent stormwater management requirements necessary to implement the purposes of any enabling legislation including those measures necessary to achieve the Surface Water Quality Standards at N.J.A.C. 7:9B.
>
> 7:8-2.2 Goals of stormwater management planning
> (a) 8. Minimize pollutants in stormwater runoff from new and existing development in order to restore, enhance and maintain the chemical, physical, and biological integrity of the waters of the State, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial and other uses of water;

3.2 Key Program Components in Creating a Utility

Define Stormwater Program Objectives

The initial step in creating a stormwater utility is to define the stormwater management program objectives. The connection between charges to customers and services provided must be clearly understood by the public. The communities that have been most successful in implementing stormwater utilities, and their associated user charges, are those that have had a thorough understanding of when and how the revenues are going to be expended.

Prepare Needs Assessment

A comprehensive "watershed master plan" is not a prerequisite to defining stormwater program components. Creation of a stormwater utility should not be contingent on the availability of comprehensive regional watershed planning, although it may occur over time after the

stormwater utility addresses initial issues. The initial identification of the need for stormwater utility functions often derives from a large laundry list of drainage and flooding problems (including problems identified in watershed plans, where such plans already exist), which can lead to a correspondingly costly list of program expenditures. It is common for initial needs to exceed readily available resources. Experience in creating stormwater utilities throughout the country has led to the development of a structured needs assessment process that can help local entities focus priorities, create a schedule for implementation, and manage costs so as to secure a stable fee system. The needs assessment process will identify a stormwater program expenditure level that corresponds to the defined objectives and the available revenues. The process will also estimate current and anticipated future utility program costs that address both recommended capital projects and mandates for increased operation and maintenance activities throughout the stormwater system.

Public Involvement Program

An effective public information/education plan is essential to develop support throughout the community for the program needs and funding mechanisms. Public involvement requires the preparation of a community involvement plan that actively solicits and facilitates the input of all community interest groups in deriving and identifying the level of service for the stormwater management program. The most successful programs have created and utilized a Citizens Advisory Committee, composed of representatives from all economic and social backgrounds. The CAC works to develop a consistent understanding of the desired level of stormwater utility service and the blend of planning, corrective, and maintenance activities for that jurisdiction.

Stormwater Utility Ordinance and Rate Resolution

A stormwater utility ordinance must be approved by the governing entity to establish the procedures for developing equitable user rates, as well as procedures for collecting bills. The ordinance establishes a stormwater utility special revenue fund into which the utility fees are deposited. The ordinance will identify the equivalent residential unit (ERU) as the selected method for defining a utility base unit. Provisions in the ordinance for any customer to appeal the charge should be established. The stormwater rate resolution establishes the rates to be charged to each user classification. The attorney for the implementing entity is typically responsible for the creation of and modifications to the ordinance and rate resolution prior to formal reading and adoption by the implementing entity(ies) (i.e., municipality, county, authority, etc).

Legally Defensible Billing System

The most common problems that arise from stormwater management rate mechanisms relate to the billing system and the land use trends specific

to that jurisdiction. Sending a bill and collecting the receipts would appear to be a very straightforward operation, especially when stormwater fees are implemented using existing billing systems. However, many jurisdictions have experienced difficulty implementing the stormwater accounting structure, the fee system and related billing software changes, and collection of past due payments. Experience from past stormwater utility implementations have created a knowledge base that avoids many of the start-up challenges to stormwater utilities.

Summary of Stormwater Utility Implementation

Implementing a stormwater utility can be broken down into six major tasks. The following outline lists the work efforts required for integrating the stormwater utility data into an existing utility billing system.

Task I	Computer Compilation of Utility Accounts and Parcels
Task II	Determination and Verification of Impervious Areas
Task III	Matching of Parcels to Utility Accounts
Task IV	Field Verification of Accounts and Parcels
Task V	Integration with Utility Billing System
Task VI	General Coordination and Administration

The objectives of Tasks I through IV are to verify the determination of impervious areas and to match utility accounts with parcels so that the proper number of ERUs can be assigned to each account. Task V is the actual modification of the computerized billing system to include the stormwater utility bill. The last task incorporates the nonspecific activities associated with general coordination and administration, with particular emphasis upon establishing an adjustment policy. Based on experience throughout the country implementing stormwater utilities, the implementation phase typically is a four to nine month process (once policy decisions have been made). The approximate cost for outside services will typically range from $100,000 to $150,000, depending upon the entity's involvement in parcel verification and public participation.

The procedure for verifying data and matching parcels with utility accounts (Tasks I through III) can be a time-consuming process. Task I involves compiling and comparing all of the parcel and utility accounts by address to facilitate the matching procedure.

The second task requires that the impervious area of all nonresidential parcels be determined. Based on experience establishing other local government stormwater utilities, it is estimated that this task would require four months to complete.

The third task is to match the corresponding parcel to each utility account. Because of the complexity of the most municipal and county

data management system, it will not be possible to match each and every parcel address and utility service address using the computer. Computer sorting and manual matching will be used to complete this task.

Field verification (Task IV) should be done principally when methods used in Task II and Task III do not yield the necessary information. This is to minimize the cost of this labor intensive task.

The fifth task is to integrate the stormwater utility data into the existing municipal, county, or authority billing system. Coordination of the integration of the two systems generally requires a minimum of two months. There are three components to this task. The first component is to modify the computer programs that generate the utility bills. The second component is to modify accounting procedures to accommodate the stormwater bills. The final component is to modify the procedures related to the printing of new bills.

The sixth and final task is to establish policies, procedures, and contractual agreements necessary to administer the stormwater billing and management programs. Procedures should be established to maintain and update the stormwater utility records and track the flow of revenues. Along with those activities, the billing adjustment policy and procedures must be completed. Evaluating petitions for adjustment typically requires several meetings with impacted members of the community.

When the above items have been accomplished, the stormwater utility program would be ready for full operation.

4. Identify Defensible User Fee Structures

Stormwater utility user fees are established to cover the costs of a local stormwater management program, specifically: (1) administration, (2) operation/maintenance, (3) replacement/renewal of the existing drainage system, and (4) new capital stormwater projects. Factors that indicate the volume of stormwater runoff from a property are the most equitable basis for a user fee structure. Several factors influence the amount of stormwater runoff generated by a particular parcel of land, including its size, the soil type, topography, impervious area, and the development intensity. Analysis of rainfall events used in stormwater management planning and design has shown that the amount of impervious area is the most important parameter affecting the quantity and quality of runoff. Impervious area of a parcel refers to surfaces that have been covered with materials (including structures) that are highly resistant to the infiltration of water. For example, shingle rooftops, pavements, building footprints, and parking lots are examples of impervious surfaces.

The approach to creating a user fee structure described below has been used extensively throughout the country, and is both effective and defensible. It has been affirmed in the courts and has been successful in demonstrating to the public that the user fee basis is fairly distributed among property owners. The equivalent user fee approach should be recommended to local entities who are considering implementing stormwater management utilities.

4.1 Parcel Analysis

The process of collecting and evaluating information describing the area of impervious surface area of properties is called parcel analysis. A stormwater utility database is created, and statistical analysis is performed on the land use information. Statistics for both impervious area and land area are calculated for all parcels, by each land use classification, based on the land use tax code for each parcel.

The impervious area for each sample parcel typically needs to be calculated using scaled measurements from aerial orthophotographs (photographic surveys that provide accurate measures of the land surface without distortion).. Parcel maps are used to locate each parcel on the aerial photography. Impervious area is measured for a representative sample of residential parcels. Statistics are then calculated that express the average impervious area per residential dwelling unit (and the sample standard deviation, and the 95 percent confidence interval).

The objective of the sampling process is to estimate the average impervious area per dwelling unit (often in each residential zoning category) with a 95 percent confidence interval that the estimate is within

10 percent of the actual average impervious area. The total impervious area for residential land use categories is then estimated as the sample average times the total number of dwelling units in a category.

The impervious area for parcels in the non-residential (i.e., commercial, industrial, institutional, agricultural, etc.) land use category are typically measured from aerial orthophotography. Where possible, all non-residential parcels are measured for impervious area, because impervious surfaces for these land uses are typically significant, highly variable, and can constitute the basis for a significant percentage of user fees. Calculating representative impervious area may not be sufficiently accurate to determine the correct individual billing for non-residential parcels, and the impervious area of all developed nonresidential parcels should be verified using scaled measurements from aerial orthophotography and site measurements.

4.2 Rate Policy

The core function of a stormwater utility is to provide a funding approach for stormwater (quantity and quality) management that allocates costs equitably across all property owners. Rate policies developed for stormwater management utilities should primarily focus on the amount of impervious area on a parcel as a basis for allocating costs to utility customers. As noted previously, equity is achieved by basing the stormwater utility fee on the user's impervious area, because this measure is directly related to runoff contribution, independent of the location of actual runoff.

A residential billing unit is defined as the average impervious area of residential dwelling units, including patios, driveways, sheds, etc., which are often associated with a residence. Using a residential billing unit as the basic billing unit is an efficient approach for stormwater utilities because it describes the largest group of customers, there is typically much less variation in the impervious surface of residential parcels than for non-residential parcels, and runoff characteristics are generally uniform. Therefore, the average residential billing unit provides a base for establishing the relative runoff potential for all other property, and simplifies utility administration. This average residential billing unit is often referred to as an equivalent residential unit (ERU). The equivalent residential dwelling unit rate policy defines the base unit as the average impervious area per residential dwelling unit.

The equivalent residential dwelling unit rate policy is based on a concept used in stormwater engineering to determine how much stormwater leaves a parcel, known as directly connected impervious area (DCIA). DCIA represents the portion of impervious area that contributes runoff beyond parcel boundaries to surface water conveyance systems (i.e.,

street gutters, storm sewers, ditches, culverts, streets, etc.). DCIA is a better indicator of the stormwater runoff impact of a given parcel than is the total impervious area of a parcel.

When detailed hydrologic analyses are conducted, the percentage of DCIA from a contributing area becomes very important in calculating surface runoff and subsequent flow contributions to channels. The typical percentage of DCIA to total impervious area ranges from 20 to 60 percent for single family residential neighborhoods and from 60 to 90 percent for higher density multifamily residential and commercial neighborhoods. Given equal areas of impervious surfaces, non-single family residential property can provide up to 4.50 (90/20 = 4.50) times more DCIA than single family property.

The equivalent residential dwelling unit rate policy defines a uniform rate for all residential dwelling units. This is equitable because single family residential dwelling units typically exhibit a relatively narrow range of impervious areas. More important, the variability that does exist for DCIA among residential dwelling units does not produce significantly different runoff impacts. A rate policy that uses the average impervious area to represent the residential dwelling unit population is appropriate and reasonably accurate. Furthermore, the administrative burden and cost are significantly reduced by grouping residential properties in one class, as opposed to calculating impervious surface for each parcel.

Adjustments to stormwater billing for a parcel should result only from on-site practices that produce direct savings to the stormwater management program. NJDEP requires developers to install Best Management Practices (BMP's) for all new development. Constructing an on-site stormwater system in accordance with the state's regulatory requirements is not sufficient justification for granting adjustments, nor does it exempt a developer/land owner from paying the stormwater utility fee.

Adjustments should be considered only if the BMP system that is installed allows: (1) less frequent maintenance, (2) avoids construction of an identified capital improvement project, (3) eliminates expenditures for certain stormwater utility functions, or (4) exceeds required stormwater quantity and quality management requirements and thereby reduces system expenditures.

5. Stormwater Utility Reference Materials

General Treatments of Stormwater Utilities

❒ Debo, T.N. and A. Reese. 2002. *Municipal Stormwater Management.* 2d ed. CRC Press. Boca Raton, FL.

Leading desk reference on stormwater management that includes a comprehensive treatment of stormwater utilities.

❒ Florida Stormwater Association. 2003. *Establishing a Stormwater Utility in Florida.* 2003 Edition.

How-to manual from the state with the largest number of stormwater utilities.

❒ Pioneer Valley Planning Commission (Massachusetts). 1999. *How to Create a Stormwater Utility.*

Deals with creation of stormwater utilities in a northeastern state.

Surveys of Stormwater Utilities

❒ Florida Association of Stormwater Utilities. 2003. *Stormwater Utilities Survey.* Tallahassee, Fl. (2003 survey accessible online to members only, 2001 survey accessible to nonmembers)

Includes information on approximately 50 stormwater utilities in Florida. For each utility, includes the base for user fees, the type of billing system, and methods of compelling payment, among other information.

❒ Black & Veatch Corporation. 2001-2002. *Stormwater Utility Survey.* Findings summarized in: Benson, R.B. 2002. "A Current Review of North American Stormwater Management Utilities." In *Global Solutions for Urban Drainage: 9ICUD*. Proceedings of the Ninth International Conference on Urban Drainage, Sept. 8-13, 2002.

Full survey includes information on 122 stormwater utilities in North America. For each utility, includes the base for user fees, the type of billing system, average monthly charges, and methods of compelling payment, among other information.

❒ Apogee Research, Inc. 1992. *Storm Water Utilities: Innovative Financing for Storm Water Management*. Prepared for the U.S. EPA Water Policy Branch, Office of Policy Analysis, Office of Policy, Planning, and Management, Washington, D.C.

Covers the legal, financial, and institutional components of a stormwater utility and discusses some of the most common obstacles to utility formation. Clean Water Act issues, NPDES permits, and other funding sources are also addressed. Based on a survey of fifty utilities nationwide.

❒ Summarized in: Doll, A., Lindsey, G., & Albani, R. 1998. "Stormwater Utilities: Key Components and Issues." Advances in Urban Wet Weather Pollution Reduction Conference, Water Environment Federation, June 28-July 1, 1998, Cleveland, Ohio, pp. 293-302.

Puts special emphasis on political challenges.

References Focusing on Financing Stormwater Management

❒ Hoag, Grant. 2004. "Developing Equitable Stormwater Fees." Stormwater 5(1). Available online: http://www.forester.net/sw_0401_developing.html

Focuses on the issue of equity in implementing a stormwater utility. Discusses the evaluation process used to calculate pollutant-based fees for stormwater programs. Also discusses what customers perceive as fair, and how to set stormwater rates that reflect the cost of providing services.

❒ AMEC Earth & Environmental. 2002. *Pro Forma Business Plan – Utility-based Stormwater Management Program.* Prepared for the Town of Chapel Hill, North Carolina.

Includes an assessment of 10 potential funding mechanisms and a discussion of the feasibility of creating the database required for establishment of equitable user fees.

❒ Institute for Water Resources, a division of the American Public Works Association. 1991. *Financing Stormwater Facilities: A Utility Approach.* Chicago, Illinois.

Emphasizes calculation of user charges and contains a worksheet for that purpose. Based on:

❒ Lindsey, G. 1988. *Financing Stormwater Management: The Utility Approach.* Stormwater Management Administration, Maryland Department of the Environment. Baltimore, Maryland.

Contains detailed information on calculation of utility charges for different types of property. Includes examples of rate structures intended to help decision-makers determine what types of properties should be included in the rate base.

❒ Hardten, R.D. et al. 1990. "How Much to Charge and How to Collect It—Stormwater Rate Setting and the Billing System." Black & Veatch Corporation. Kansas City, Missouri.

❒ Cyre, H.J. 1982. "Stormwater Management Financing." Presented to the International Public Works Congress, Houston, Texas. Water Resource Associates, Inc. Bellevue, Washington.

Discusses conceptual differences between stormwater utilities and other types of utilities.

Other References

❒ Brisman, A. 2002. "Considerations in Establishing a Stormwater Utility." *Southern Illinois University Law Journal*. Vol. 26, pp. 505-529.

Discusses potential legal challenges to stormwater fee structures.

❒ Chlarson, J. and S.D. Hemsley. 2002. "Model Stormwater Utility Ordinance." Municipal Technical Advisory Service, University of Tennessee.

❒ Busco, D. and G. Lindsey. 2002. *An Annotated Bibliography of Stormwater Finance Resources*. Center for Urban Policy and the Environment, Indiana University-Purdue University Indianapolis. Available online as part of An Internet Guide to Financing Stormwater Management, http://stormwaterfinance.urbancenter.iupui.edu.

Appendix A

Potential Changes in NJ Law That Support Stormwater Utility Services

In a report titled *Recommendations for Stormwater Utility Implementation in New Jersey*, several recommendations were advanced for existing laws to be modified to facilitate implementation of stormwater utilities by the broadest possible range of public entities. The *Recommendations* report proposed that each law should support the following functions:

- Authorize creation and operation of stormwater utility systems
- Authorize imposition of user fees to finance operation and maintenance and repayment of bonds
- Require that stormwater system user fees be based on the stormwater runoff contribution of each parcel of land
- Reference a stormwater utility manual that provides guidance regarding stormwater utility implementation and establishment of defensible user fee structures. A manual of this type has been circulated describing a hypothetical stormwater utility implementation process for "Greentown Borough."

This memorandum identifies specific modifications needed in specific laws to allow the laws to provide the stormwater functions and services listed above.

NJSA 40

Language should be added to NJSA 40 that authorizes municipalities to establish stormwater utilities by ordinance. The added language should authorize imposition of user fees and require that the fees be based on the stormwater runoff contribution of each parcel of land. The amended law should also reference a stormwater utility guidance manual.

An appropriate location for the new provisions in NJSA 40 would be NJSA 40:62, which already deals with municipal utilities and water districts. The authorizing language in NJSA 40 should reference the municipal budgeting requirements related to public utilities in NJSA 40A:4 (see, for example, NJSA 40A:4-33, 34, 62 and 74).

Local Bond Law

Under the Local Bond Law, NJSA 40A:2-1 et seq., bond ordinances to finance municipal public utilities may commit the municipality to impose user fees to pay off the bonds and fund the operation of the utility (NJSA 40A:2-15(d)). Language should be added requiring that fees imposed on users of stormwater systems be based on the stormwater runoff contribution of each parcel of land. The added language should also reference a stormwater utility guidance manual.

Municipal and County Sewerage Act

The Municipal and County Sewerage Act, NJSA 40A:26A-1 et seq., currently authorizes municipalities, counties, and combinations of municipalities and counties to create wastewater utilities. This law should be modified to encompass stormwater management functions. The definition of "sewerage facilities" in NJSA 40A:26A-3 should be amended to read as follows:

> "Sewerage facilities" means the plants, structures or other real and personal property acquired, constructed or operated, or to be financed, acquired, constructed or operated, or any parts thereof, used for the storage, collection, reduction, reclamation, disposal, separation or other treatment of wastewater, ~~or~~ sewage sludge or stormwater or for the final disposal of residues resulting from the treatment of wastewater or stormwater, including but not limited to, pumping and ventilating stations, treatment plants and works, connections, outfall servers, interceptors, trunk lines, drainage systems, catch basins, detention ponds and other appurtenances necessary for their use or operation.

The Act currently authorizes imposition of fees on users of "sewerage services" (NJSA 40A:26A-10). "Sewerage services" is not defined. Because many people do not view stormwater management as a service, a definition of "sewerage services" should be added to NJSA 40A:26A-3 that includes provision and maintenance of stormwater facilities.

NJSA 40A:26A-10 should be amended to specify that fees for use of stormwater systems must be based on the stormwater runoff contribution of each parcel of land. The added language should reference a stormwater utility guidance manual.

Municipal and County Utilities Authority Law

Stormwater-specific provisions should be added to the Municipal and County Utilities Authority Law, NJSA 40:14B-1 et seq. The needed modifications are structurally similar to those made in 1977 to authorize municipal authorities to manage solid waste.

NJSA 40:14B-2(1) should be amended to refer to works for the collection, storage, treatment or disposal of stormwater. Definitions of stormwater, stormwater system, should be added to NJSA 40:14B-3. The definition of "utility system" should be amended to include stormwater systems. The definition of "service charges" should be amended to include stormwater service charges. NJSA 40:14B-6(c) should be amended to refer to stormwater systems.

A new section should be created for stormwater service charges that corresponds to NJSA 40:14B-22 regarding sewerage service charges. The new section should require that fees for use of stormwater systems must be based on the stormwater runoff contribution of each parcel of land. This section should also reference a stormwater utility guidance manual.

County Improvement Authorities Law

The County Improvement Authorities Law, NJSA 40:37A-44 et seq., should be modified to specifically authorize implementation of stormwater management functions and provide for imposition of user fees to finance construction, operation and maintenance of stormwater management facilities.

Definitions of stormwater and stormwater system should be added to NJSA 40:37A-45. Acquisition, construction, operation and maintenance of stormwater systems should be added to the purposes of an improvement authority listed in NJSA 40:37A-54. NJSA 40:37A-57 should be amended to specify that fees for use of stormwater systems must be based on the stormwater runoff contribution of each parcel of land. The added language should reference a stormwater utility guidance manual.

Appendix B

A Model User Cost Assessment for Stormwater Utility Implementation

An Illustrative Analysis Prepared for a Hypothetical Municipality: "Greentown Borough, NJ"

September 2005

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Introduction

The *Recommendations for Stormwater Utility Implementation* project identified a fundamental need to create a source of revenue to support stormwater management activities. The stormwater utility concept relies on user fees to generate revenue. Using information about user cost assessment practices applied by stormwater utilities throughout the Country, a model user cost assessment has been created in this Appendix for a mythical Borough in New Jersey, to illustrate the range of issues, program costs, and funding options.

The scenario for our mythical NJ municipality, "Greentown Borough", assumes that it is facing many stormwater management challenges: erosion problems, several flood prone areas, an aging and in some cases deteriorated storm sewer system, and regulatory compliance pressures under the new Municipal Stormwater Regulation Program. To address these issues, "Greentown Borough" is proactively seeking to form and implement a stormwater utility, which can generate revenues for the specific purpose of solving the erosion and flooding problems, repairing storm sewers where they are failing, reaching a desired level of service to adequately operate and maintain the storm sewer system, and achieving compliance with the NJ Stormwater Management Program Regulations.

The concept of establishing a user charge system is neither a new idea nor a novel solution. This system is a well-accepted approach for water, wastewater, and municipal solid waste services; however, implementing user fees for stormwater management is untested in NJ. Like a wastewater or water utility, the stormwater service charge is user-oriented, with costs allocated in proportion to the quantity of runoff contributed to the stormwater system. Charges are related to the impervious area factor (i.e., potential runoff following a storm event from a given parcel of land). In this manner, each parcel of land within a local jurisdiction is assigned a fee based on its runoff characteristics.

Greentown Borough is responsible for the stormwater conveyance system, which includes maintenance/replacement of culverts, manholes, storm aprons, catch basins, sedimentation basins, storm sewer pipes, ditches, and handling complaints from residents.

Greentown Borough's stormwater system discharges into navigable streams that ultimately discharge into Green River. Federal and State regulations pertaining to water quality will increase Greentown Borough's role in stormwater management by mandating reductions in pollutant loading from stormwater discharged into the state's streams and rivers.

This report discusses the funding options available for supporting the stormwater management program costs from a source other than the General Fund, or ad valorem taxes. The funding

options must support an enhanced maintenance program, as well as water quality improvement activities. The options must also provide funding for stormwater management permitting, master planning, and administrative activities for stormwater management.

Current Level of Service

Currently, Greentown Borough's stormwater operations provide a low level of stormwater maintenance for troublesome areas. A stormwater funding option must support the enhancement of the current stormwater physical features by producing adequate revenue to cover the cost of operation, routine maintenance, and replacement. In addition to these needs, revenue must be available to construct other stormwater capital improvements, as needed.

Greentown Borough recognizes the need to improve its level of stormwater service from the current operation to a more proactive operation. To reach this goal, Borough staff and their engineering consultants presented to the recently-formed Stormwater Advisory Committee (SWAC) the pros and cons of expanding the level of service, establishing a capital improvement program, and providing for operation and maintenance services. In doing so, the SWAC gained an understanding that additional equipment will need to be purchased, new personnel hired, and a stormwater funding source should be established to meet the goals of the recommended stormwater management program.

Comprehensive Stormwater Management

Greentown Borough has recognized the importance of taking a proactive approach toward stormwater management. To accomplish this, the Borough prepared a Stormwater Management Assessment by collecting input on stormwater issues in the Borough. The Stormwater Management Assessment, based on that input, identified three major goals: to address water quantity (flooding) issues, to address water quality (improvement) needs, and to evaluate the revenue generation needs. Initially, the water quality issues will involve meeting the requirements of the NJ Stormwater Management Program.

The elements of a stormwater management program include planning, land use regulation, design, operation and maintenance, construction, and administration. The stormwater funding approach must support implementation of the stormwater management goals. Likewise, capital stormwater project funding needs must be identified. The results of the system evaluation conducted by Borough's staff are presented in Section 2 of this User Cost Assessment.

Following review of the proposed stormwater management activities with the Committee, Greentown Borough's engineering consultant recommended that the Borough expend an average of approximately $2,600,000 per year from 2005 through 2009. These expenditures are need to address the combined requirements of solving local flooding problems, and to satisfy NJDEP water quality improvement requirements under the Stormwater Management Regulation Program.

As discussed in Section 6, an initial monthly rate of approximately $4.00 per Equivalent Residential Unit would be needed to fund the stormwater program for the first five years. The stormwater management user fee charge will be included on the existing Borough utility bill to minimize administrative costs.

Stormwater Funding Options

Greentown Borough has identified the need for additional revenue to support stormwater program management requirements. As the current and anticipated future requirements from NJDEP's Stormwater Regulation Program were quantified, and the cost impacts were clarified, the pressure upon the general fund is predicted to increase. Given the public pressure to keep property taxes low, and the cap on increases in municipal budgets, other options for funding stormwater management needed to be quantified and developed.

During the SWAC meetings, Greentown Borough evaluated several options for financing stormwater management expenditures. A synopsis of these options is presented in Section 3 to outline the advantages and disadvantages of each option. As a result of these discussions, the Committee agreed to support implementing a stormwater user fee.

A stormwater utility concept relies on user fees to generate revenue. The contemplated utility program considers that all developed property would be charged a stormwater utility fee based on the parcel's impervious area - as a measure of the parcel's stormwater runoff contribution. Stormwater runoff is discussed further in Sections 4 and 5.

Traditionally, the stormwater utility concept has been largely applied to urban areas. In urban areas, the use of impervious area as the "yardstick" for computing charges has worked extremely well. When this system is used for generating revenue, the impervious area is only that area within the parcel boundaries. The impervious area of the streets within public rights-of-way are excluded from the computation since these items are actually a major portion of the conveyance system for stormwater.

Based on national experience, the most frequently used rate policy for allocating the cost of stormwater management is based on the impervious area of the <u>average</u> residential dwelling unit. The impervious area of the average residential unit defines the equivalent residential unit (ERU). This is calculated by summing the total area of impervious improvements on residential property divided by the total number of residential dwelling units. Using this methodology, all residential dwelling units would be treated as a single user class with each customer charged a fee equal to one ERU.

For Greentown Borough, through extensive analysis of developed parcels, the ERU has been calculated to be 2,174 square feet. A nonresidential parcel would be charged according to the ratio of its impervious area to the ERU square footage. As an example, a typical office building with an impervious area of 50,000 square feet would contribute 22.9 times the runoff of one ERU (50,000 divided by 2,174 equals 22.9 ERUs). Applying these bases of contribution (impervious area of one dwelling unit = 2,174 square feet = 1 ERU) to developed land in the Borough, a total of approximately 58,000 ERUs would be generated.

Implementation Steps

To successfully implement the stormwater utility, Greentown Borough must enact a stormwater utility ordinance. To complete the implementation process, the following actions are needed:

1. Review the recommended expenditure and develop a final budget for the upcoming fiscal year.

2. Authorize the Engineering and Billing Departments to complete the implementation activities required to initiate billing.

3. After final billing units are determined and impacts from the adjustment policy are quantified, adopt the final rate for placement on the bills.

Several costing spreadsheets are included with this Executive Summary for purposes of illustrating the cost components of stormwater utilities.

Section 1
Introduction

Greentown Borough is responsible for providing reasonable flood protection and controlling stormwater and nonpoint source pollution. Traditionally, funds allocated for stormwater management have been used to correct emergency stormwater problems and have not been adequate to develop a comprehensive stormwater management program. In recent years, plans to develop a comprehensive stormwater management program have been hampered by limited contributions from the General Fund. Since further upstream development is inevitable and more stringent state water quality regulations are now in effect, the Borough must identify and evaluate financial alternatives for effective stormwater management.

In recent years, federal and state regulatory agencies have turned their attention to stormwater management as an element of water quality protection. Section 402 (Municipal and Industrial Stormwater Discharges) of the Water Quality Act of 1987 required the U.S. Environmental Protection Agency (EPA) to promulgate National Pollutant Discharge Elimination System (NPDES) permit application requirements for industrial and municipal entities. EPA's permit regulations for municipalities with populations under 100,000 were promulgated in December 1999. New Jersey Municipal Stormwater Regulation Program rules were published on February 2, 2004 at N.J.A.C. 7:14A-25. In late January 2004, NJDEP notified Greentown Borough, along with all 566 Tier A and Tier B municipalities in the state that they will be required to obtain a Municipal Stormwater Permit. Greentown Borough's Public Works Department implements measures for dealing with local stormwater problems. Enforcement of the Borough's local code as it relates to stormwater management is the responsibility of the Department of Public Works, the Planning Board and the Zoning Board.

The focus of this study is to develop a mechanism to fund planning, administration, construction, and maintenance costs. Specific capital improvements identified in this report are options open to the Borough to enhance stormwater management in problem areas. Future capital improvements will be re-evaluated upon the publication of the Borough's Stormwater Management Plan.

Within the context of these expanded requirements, this study concentrates on defining an adequate funding method that can cover the costs of stormwater management with an equitable yet cost-effective revenue source. The stormwater utility considered in this study is a user-oriented funding mechanism that allocates the cost of stormwater management according to the stormwater contribution of each land parcel, regardless of ownership or tax status.

This report was prepared using several "example" sources. Data "sources" included Borough staff, information provided by the Borough Assessor's office, and from Engineer and Consultant files.

Section 2
Existing and Future Operation & Maintenance

In order to quantify the program costs to support stormwater management, Borough staff modified previous program projections to correlate to specific activities. Following this development, their consultant reviewed the information and made minor modifications to support the values presented in this section. The total program was evaluated with emphasis upon satisfying local flooding problems in the Borough and satisfying NJDEP permit requirements.

2.1 Drainage System

The mythical Borough of Greentown is located in Green County. The growth rate within the Borough has been good, but is approaching a "built out" condition. The geographic area is generally bounded by: Locust Township on the east; Walnut Borough on the south; and Elm Township on the west and north.

2.2 Existing Facilities and Level of Service

The existing stormwater structures are listed in Table 2-1. The majority of the stormwater system is maintained by Greentown Borough, with the exception of the public and private waterways. Major equipment costs for 2003 used for maintaining the drainage structures and related facilities are listed in Table 2-2. Routine operations include periodic cleaning of ditches, maintenance of catch basins, street sweeping, and storm drains/culverts, which are replaced on an as needed basis. Due to the lack of routine drainage structure maintenance, rain event drainage emergencies occur too frequently to be tolerated; however, more personnel are needed to provide a greater level of maintenance for these structures.

2.3 Existing Organization and Budget

Greentown Borough Public Works Department is responsible for construction, operation, and maintenance of the stormwater management system. The Department maintains drainage ways, street sweeping, and performs emergency maintenance on failed stormwater structures. In addition, the Department provides technical support as needed for new developments and proposed stormwater facilities. The Engineering Department coordinates with other technical personnel on stormwater duties related to sizing of lines and capital improvements. Table 2-3 shows that 2.5 full-time equivalent employees were assigned to stormwater-related maintenance activities in 2003.

In the past, the General Fund provided funding for nearly all maintenance activities. Table 2-4 summarizes the fiscal year 2003 budgeted expenditures. In order to properly quantify the short term needs (year 2005-2009), the most recent complete fiscal year (2003) was used to identify existing costs. Since the stormwater funding mechanism would not be operational in 2004, projected costs in this document begin with January 1, 2005.

2.4 Future Program and Costs

2.4.1 Future Operation and Maintenance

Greentown Borough recognizes the need to improve the level of stormwater service from the current as needed basis to a more preventative basis. To reach this goal, we recommend that additional equipment must be purchased and new personnel hired. A program for new equipment and personnel has been developed and is proposed for implementation in 2005 and beyond.

2.4.2 Capital Improvements Program (CIP)

Greentown Borough's stormwater master plan needs to be updated and will identify capital improvements necessary for efficient operation. As envisioned, the required capital improvements to the primary and secondary systems will benefit the entire City. Stormwater funds must provide the necessary revenue to support these improvements. Table 2-5 presents a preliminary indication of the resources needed to fund these projects from 2005 through 2009. The values presented in Table 2-5 are predicated upon bonds being acquired by the Borough on an annual basis. The values presented are debt service payments anticipated for the types of projects indicated. Naturally, bond costs may fluctuate and the Borough may elect different debt service arrangements as financial conditions vary. The total level of expenditure should remain near the values indicated.

2.4.3 Other Annual Costs

Table 2-6 illustrates the costs for engineering and administration for 2003. When these values were reviewed, additional costs were developed to reflect the items having no costs in 2003. Particular emphasis was placed upon the need for stormwater utility management and state regulatory requirements. In order to support these functions, it is recommended that a stormwater engineer and a stormwater technician be hired to support these programs beginning in 2005. Some costs are one-time charges as opposed to the costs for personnel which recur annually. There are other annual costs (i.e., a phased master plan and permitting expenditures) that are projected to occur annually for three to five years. Since these activities will be complete in a given year, the costs will be re-evaluated each year.

2.5 Five-Year Stormwater Management Program Projected Costs

This report outlines the timing and expenditures necessary to achieve the stormwater management program as itemized in Table 2-4. The costs for funding and approach to funding are predicted based on the existing fiscal year 2004 Borough budget, including an allocation for administrative costs. The costs shown for capital improvements are based upon Table 2-5. Table 2-7 reflects annual stormwater expenditures (excluding capital) beginning in fiscal year 2005 through fiscal year 2009.

From the evaluations conducted during this investigation, stormwater management program costs have been projected for years 2005 through 2009. The basis of these projections were the 2003 actual expenditures, the state regulatory requirements, and experiences with other stormwater systems. Table 2-8 reflects the total costs for annual operating expenditures and annual debt service payments for capital projects. The values reflected in Table 2-8 indicate an approximate annual revenue need of $2,600,000.

Table 2-1

GREENTOWN BOROUGH
STORMWATER UTILITY PROGRAM

Stormwater Structures

Structures	Total [1]
Manholes	2,750
Storm Sewer Pipe/Culvert	107 Miles
Curb Inlet	5,225
Catch Basin	275 [2]
Borough Streets	165 Miles [3]

Notes:

[1] This table is based on data provided by the Borough

[2] Based on estimated 5% of total inlets

[3] Four miles have ditches

Table 2-2

Greentown Borough
Stormwater Program
Existing Maintenance Equipment Costs
2003

Item Description	Equipment Cost
Storm Sewer Inlet Inspection & Cleaning	$5,760
Storm Sewer System Repair	$33,024
Storm Sewer Inspection & Cleaning	$0
Debris Cleanup at Bridges	$480
Emergency Response - Floods	$68
Street Sweeping	$2,304
Erosion Control	$0
Televising Storm Sewers	$0
Investigate Illicit Discharges	$384
Engineering Planning	$372
Engineering Design & Construction Inspection	$2,477
Totals	**$44,869**

Table 2-3

Greentown Borough
Stormwater Program
Existing Maintenance Costs
2003

Item Description	Labor Cost	Equipment Cost	Materials Cost	Administration Cost	Contracted Cost	Overhead Cost	Fringe Benefits	Total Cost
Storm Sewer Inlet Inspection & Cleaning	$18,767	$5,760	$0	$2,346	$2,400	$192	$9,384	$38,849
Storm Sewer System Repair	$92,180	$33,024	$20,208	$12,695	$557	$816	$46,080	$205,560
Storm Sewer Inspection & Cleaning	$0	$0	$0	$0	$0	$0	$0	$0
Debris Cleanup at Bridges	$480	$480	$0	$83	$0	$0	$240	$1,283
Emergency Response - Floods	$2,781	$68	$0	$177	$0	$0	$1,391	$4,416
Street Sweeping	$4,224	$2,304	$236	$1,994	$42,720	$5,894	$2,112	$59,484
Erosion Control	$0	$0	$0	$432	$12,000	$0	$0	$12,432
Televising Storm Sewers	$0	$0	$0	$778	$21,600	$0	$0	$22,378
Totals	$118,432 (1)	**$41,636**	$20,444	$18,505	$79,277	$6,902	$59,207	$344,402

Note:

(1) Equivalent to 2.5 full-time employees

Table 2-4

Greentown Borough
Stormwater Program
Existing Operation & Maintenance Costs
2003

Item Description	Labor Cost	Equipment Cost	Materials Cost	Administration Cost	Contracted Cost	Overhead Cost	Fringe Benefits	Total Cost
Storm Sewer Inlet Inspection & Cleaning	$18,767	$5,760	$0	$2,346	$2,400	$192	$9,384	$38,849
Storm Sewer System Repair	$92,180	$33,024	$20,208	$12,695	$557	$816	$46,080	$205,560
Storm Sewer Inspection & Cleaning	$0	$0	$0	$0	$0	$0	$0	$0
Storm System Weather Service	$0	$0	$0	$0	$1,056	$0	$0	$1,056
Debris Cleanup at Bridges	$480	$480	$0	$83	$0	$0	$240	$1,283
Complaint Investigation	$10,000	$0	$0	$367	$0	$200	$5,000	$15,567
Emergency Response - Floods	$2,781	$68	$0	$177	$0	$0	$1,391	$4,416
Street Sweeping	$4,224	$2,304	$236	$1,994	$42,720	$5,894	$2,112	$59,484
Permit Fee	$0	$0	$0	$0	$0	$0	$0	$0
Investigate Illicit Discharges	$3,264	$384	$192	$138	$0	$0	$1,632	$5,610
Erosion Control	$0	$0	$0	$432	$12,000	$0	$0	$12,432
Televising Storm Sewers	$0	$0	$0	$778	$21,600	$0	$0	$22,378
Engineering Planning	$8,886	$372	$106	$338	$0	$34	$4,443	$14,179
Engineering Design & Construction Inspection	$59,235	$2,477	$705	$3,355	$30,000	$770	$29,619	$126,161
Update 100 Year Floodplain Maps	$0	$0	$0	$0	$0	$0	$0	$0
Storm Water Utility Management	$0	$0	$0	$0	$0	$0	$0	$0
Storm Water Billing	$0	$0	$0	$0	$0	$0	$0	$0
Recovery of Utility Setup Fees	$0	$0	$0	$0	$0	$0	$0	$0
Totals	$199,817	$44,869	$21,447	$22,703	$110,333	$7,906	$99,901	$506,975

Notes:

(1)Fringe Benefits Based on 50% of Salary

(2)Costs Based on 2003 actual cost

(3)Program Budgets for all Above Categories not Established yet.

Table 2-5

Greentown Borough
Stormwater Program
Bonded Capital Costs
2005 - 2009

Item Description	Bonded Capital Cost					
	2005	**2006**	**2007**	**2008**	**2009**	**Total**
Storm Sewers	$669,002	$591,147	$636,935	$733,820	$768,827	$3,399,731
Detention Ponds	$200,000	$185,000	$95,000	$105,000	$110,000	$695,000
Public Works Building Storm Sewer	$0	$0	$90,000	$0	$0	$90,000
N. 124th St. Storm Sewer	$740,000	$0	$0	$0	$0	$740,000
Backlog Projects	$300,000	$300,000	$300,000	$300,000	$300,000	$1,500,000
Totals	**$1,909,002**	**$1,076,147**	**$1,121,935**	**$1,138,820**	**$1,178,827**	**$6,424,731**

Capital projects are bonded over a 10 year period.

Table 2-6

Greentown Borough
Annual Stormwater Program Expenditures
Existing Level of Service
Other Annual Costs
2003

Item Description	Total Cost
Engineering	
Engineering Planning	$14,179
Engineering Design & Construction Inspection	$126,161
Investigate Illicit Discharges	$5,610
Administration	
Complaint Investigation	$15,567
Information & Education	$0
Permit Fee	$0
Update 100 Year Floodplain Maps	$0
Stormwater Utility Management	$0
Stormwater Billing	$0
Recovery of Utility Setup Fees	$0
Totals	**$161,517**

Annual inflation rate assumed is 4%.

Table 2-7

Greentown Borough
Stormwater Program
Annual Operation & Maintenance Expenditures

Item Description	2005 Total Cost	2006 Total Cost	2007 Total Cost	2008 Total Cost	2009 Total Cost
Storm Sewer Inlet Inspection & Cleaning	$53,984	$56,144	$58,390	$60,725	$63,154
Storm Sewer System Repair	$222,668	$231,575	$240,838	$250,472	$260,490
Storm Sewer Inspection & Cleaning	$64,017	$66,578	$69,241	$72,010	$74,891
Storm System Weather Service	$1,144	$1,190	$1,237	$1,287	$1,338
Debris Cleanup at Bridges	$1,390	$1,446	$1,503	$1,564	$1,626
Complaint Investigation	$32,380	$33,675	$35,022	$36,423	$37,880
Emergency Response - Floods	$4,515	$4,696	$4,884	$5,079	$5,282
Street Sweeping	$80,031	$83,232	$155,282	$161,493	$167,953
Permit Fee	$259	$269	$280	$291	$303
Investigate Illicit Discharges	$6,078	$6,321	$6,574	$6,837	$7,110
Erosion Control	$12,929	$13,446	$13,984	$14,544	$15,125
Information & Education	$4,310	$4,482	$4,661	$4,848	$5,042
Televising Storm Sewers	$40,350	$41,964	$43,643	$45,388	$23,602
Engineering Planning	$15,359	$171,374	$16,613	$17,277	$17,968
Engineering Design & Construction Inspectior	$136,676	$142,143	$147,829	$153,742	$159,892
Update 100 Year Floodplain Maps	$5,495	$5,715	$5,943	$6,181	$6,428
Stormwater Utility Management	$124,434	$129,411	$134,588	$139,971	$145,570
Stormwater Billing	$25,364	$26,379	$27,434	$28,531	$29,672
Recovery of Utility Setup Fees	$140,159	$0	$0	$0	$0
Unanticipated Additional Items	$300,000	$300,000	$300,000	$300,000	$300,000
Totals	**$1,271,543**	**$1,320,040**	**$1,267,946**	**$1,306,664**	**$1,323,326**

Annual inflation rate assumed is 4%.

Table 2-8

Greentown Borough
Annual Stormwater Program Expenditures

	2005	2006	2007	2008	2009	Total
Annual Operation & Maintenance Costs	$1,271,543	$1,320,040	$1,267,946	$1,306,664	$1,323,326	$6,489,518
Annual Bonded Capital Costs	$1,909,002	$1,076,147	$1,121,935	$1,138,820	$1,178,827	$6,424,731
TOTAL	$3,180,545	$2,396,187	$2,389,881	$2,445,484	$2,502,153	$12,914,249

Section 3
Alternate Funding Sources

3.1 Introduction

The funding sources available to Greentown Borough for the stormwater management program are varied and could be used in various combinations. The following section describes these potential funding sources. The advantages and disadvantages of each alternative are included, along with an indication of the activity for which the funding source is suited (e.g., administrative services, routine operation/maintenance, renewal/replacement, and capital improvements.

3.2 Alternatives

3.2.1 General Fund

The General Fund comprises many revenue sources including: property tax, state and federal revenue sharing, municipal state aid, franchise fees, fines/penalties, etc. The General Fund can be considered as a "bank" into which revenues are placed and from which many municipal services are funded. When considering the General Fund's capacity to effectively support the Borough's stormwater management program, the discussion must focus upon the competition for funds as well as the fairness and equity of this option.

When evaluated in this manner, the General Fund has several disadvantages. First, the funding demands for education and public safety (police and fire) decrease the General Fund's ability to support significant increases for the stormwater management program. The priorities of other "essential services" often leave little available funding for a comprehensive stormwater management program. Second, when the fairness and equity of this revenue source are addressed, there is no relationship between the amount of property tax paid for a parcel based on the value of the property and the parcel's contribution to stormwater runoff (either the quantity of runoff or water quality). These combinations make General Fund support difficult to substantiate as a total equitable or effective funding source for a stormwater management program.

Funding the stormwater management program through the General Fund with property taxes does offer some advantages:

- The fund is the primary existing source of revenue;
- The billing system is established;
- There are minimal implementation and administration costs; and
- An individual's cost (bill) is tax deductible.

Many communities have used a combination of General Fund support and stormwater utility fee support to bridge the transition from the General Fund to full enterprise funding of a stormwater management program. The period of this transition typically varies from one to five years. The advantage of this combination is that maintaining a partial General Fund contribution for stormwater management while initiating the user fee system greatly improves the ability to address problems in a comprehensive and immediate manner. Also, the overall cost impact on property owners is usually

somewhat less if partial General Fund support is maintained (i.e., the stormwater utility fee is less) and rarely do cities reduce property taxes when the revenue requirement for funding the stormwater management program is transferred to a new utility. A comprehensive stormwater management program is a long-term process; one that will require early comprehensive planning and a major commitment to operations and maintenance for the life of the program.

3.2.2 Local Improvement Assessments

Many capital improvements enhance the value of adjacent land, thereby providing a potential benefit to property owners. For example, if a drainage system is installed along a street where no stormwater management system had existed before, then the control of flooding increases the value of property next to the road. A local improvement assessment may be imposed on specially benefited properties to pay for the improvements (see for example, NJSA 40A:27-10 through 14). The funds from the additional tax or assessment are returned to the affected area and used for program administration, renewal/replacement, and capital improvements. For example, if stormwater management facilities are constructed to benefit a particular drainage basin/watershed within a city or county, an additional tax levy would be assigned to the residents of that area.

The advantage of local improvement assessments is that stormwater management improvements are funded by those who most benefit from them. Disadvantages of this funding option are as follows:

- Local improvement assessments could generally be imposed on only a portion of the Borough;
- The affected portion of the Borough may not be capable of generating required revenues when needed;
- Revenues generated can only be spent within the are in which they are collected and this may not necessarily be where stormwater management funds are most needed; and,
- Allocation of the benefits (or costs) of the improvement to each property is a lengthy and cumbersome exercise.

Previous experience with local improvement assessments has shown that they generally do not work for funding major stormwater management programs because of the limited size of the specially benefited area and the limitations on use of the funds raised.

3.2.3 Homeowners Association

The homeowners association concept is similar to the special assessment district in that a relatively small area would receive an additional levy. The assessments are designed to meet the specific needs and desires of each association. This method is generally available only for residential parcels and cannot be used to finance an entire stormwater management program. Additionally, because the level of service and the assessment will vary among associations, inconsistencies in protection and inequities of assessment can result.

3.2.4 Fees/Licenses/Permits

Funding from this source is generally limited to cover the cost of permit review, enforcement, and the inspection of construction. Since these income sources are very limited and erratic, they are difficult to dedicate toward the other aspects of the stormwater management program (i.e., administration, operation/maintenance, and capital improvements).

3.2.5 Penalties and Fines

Similar to permit fees, revenues from penalties and fines are limited. Such income can be placed in the General Fund; however, it may be more reasonable to use the fines to correct the violation and improve enforcement. This type of income should be used in conjunction with the other stormwater funding to finance the complete program.

3.2.6 Bonds

General obligation, revenue, or special assessment bonds are normally used by governments to pay for large capital improvement programs. Payments for general obligation bonds are normally from the General Fund (i.e., ad valorem tax income). Most often, the revenues from a special assessment district or a stormwater utility are used to meet the debt service payment for revenue bonds. The principal advantage of selling bonds is that a large-scale capital improvement program can be initiated when the facilities are needed rather than when the funds are accumulated. The disadvantage is the interest charges associated with the long-term debt incurred by the entity for operational activities.

3.2.7 Pay-As-You-Go Sinking Fund

This type of stormwater funding is most commonly used as an adjunct to revenue bond financing. A fund is formed similar to a separate account and receives revenues from numerous sources (i.e., ad valorem taxes or stormwater utility income). The fund accumulates revenue until sufficient money is available for an identified project. Then the total project amount is removed from the fund and the growth stage starts over. No money is borrowed, so it is "pay-as-you-go" and, since funds are periodically deposited (sunk) into the account, it is referred to as a sinking fund.

3.2.8 Developer Contributions Within Development

As a condition for approval of development, the Borough could require the developer of a subdivision or large parcel to construct stormwater management facilities within the development and dedicate them to the local government upon completion. In addition, developers could be required to donate drainage easements or other types of partial rights to the local government for stormwater purposes. The local government would be responsible for the operation/maintenance. Thus, the developer would be responsible for funding the capital program, while the local government would be responsible for funding the operation/maintenance. The advantage of this type of funding mechanism is the transfer of the capital burden away from the local government. The primary disadvantage is that the local government must have another funding source not only to operate and maintain the stormwater facilities but to replace them at the end of their useful life.

3.2.9 Developer Contributions for Off-Tract Improvements

An alternative to requiring developers to construct stormwater management facilities is to require them to pay an initial front-end charge for the capital improvements needed to serve their development. The charge would be a pro-rata share of the cost of providing off-tract improvements made necessary by the proposed development together with other developments (see NJSA 40:55D-42).

Contributions for off-tract improvements are appropriate in two types of cases. The first is where there is a large marginal cost for constructing additional facilities. A developer may pay for a portion of the construction of a large detention facility in-lieu-of the construction of a detention facility for an individual development. The second case in which a contribution for off-tract improvements is appropriate is where the introduction of a sizable development creates the need for a new type of stormwater management system. For example, the stormwater problem may be adequately controlled

within a watershed using drainage ditches and swales. However, with the introduction of a new development, a detention/retention facility may be required. In this case, it would be appropriate for the developer to contribute to construction of the new facility.

The major advantage of contributions to off-tract improvements is that regional systems are promoted rather than small-scale individual systems. The larger stormwater facilities are easier to maintain and can provide more economical solutions. The disadvantage is that the developer must wait until sufficient funding is available for the regional system and until the facility can be constructed unless he or she commits to building an interim system which can be either removed or incorporated in the larger system. In developed portions of the Borough which may have significant existing needs, there would be fewer new developments to contribute to the construction of new facilities. Nevertheless, contributions for off-tract improvements can reasonably be associated with a stormwater utility in development/redevelopment portions of communities.

3.2.10 Developer Incentives

Incentives could be offered to induce developers to use proper stormwater management planning techniques. For example, such incentives could include waiving maximum allowable residential densities if land is dedicated to the Borough for stormwater purposes. This method would still require the construction of the stormwater facility by the Borough; however, the land costs for the stormwater management facility would be reduced. The two major disadvantages of this method are: (1) it may be in direct conflict with the goals and objectives of the land use element of the Borough's Master Plan; and (2) it increases the magnitude of stormwater and nonpoint source pollution problems due to the higher intensity level of development.

3.2.11 Stormwater Utility

Using revenues from a user charge system to fund stormwater management programs is relatively new in New Jersey. The concept has achieved growing popularity in the western and midwestern United States since the mid 1970s. Since the concept was established, 320 entities have adopted ordinances and taken steps to implement the stormwater utility concept.

The user charge assigned to the fee payer is an equitable share of the cost of the stormwater management program based on the relative contribution to the stormwater problem. This share is determined by the amount of runoff attributed to the property. The greater the runoff, the greater the contribution to the problem. The relative amount of runoff is estimated by the actual amount of impervious area on the parcel. This allows for the equitable and fair distribution of the stormwater management program costs.

The stormwater utility can be used for all five aspects of the stormwater management program: administration; routine operation/maintenance; renewal/replacement; capital improvements; and monitoring. The income can also be used to pay the debt service for a stormwater capital improvement program. A stormwater utility is a more equitable funding mechanism than reliance on General Fund revenue and most special districts, since charges assessed to each parcel of land are based upon usage of the drainage system rather than property value.

Because commercial properties generate much more runoff and stormwater pollution per square foot than single family residential properties, commercial sites are charged a proportionately greater fee by the stormwater utility. A principal advantage associated with a stormwater utility, is that tax-exempt properties (federal, state, school and other tax-exempt buildings and installations) are assessed a user-fee that reflects their relative stormwater contribution to the Borough's drainage system. For example,

each tax-exempt parcel will be charged a stormwater utility fee that is related to the stormwater discharge from the site. The method is similar to that used by other public utilities: tax-exempt property is charged based upon usage (e.g., power consumption, water consumption).

Advantages of a stormwater utility program include:

- Dedicated funding for the Borough's stormwater management program;
- Associate the stormwater utility fee with the other utilities already administered by the Borough;
- An equitable user fee based on runoff contribution rather than the property value;
- A mechanism to charge tax-exempt parcels for municipal stormwater management services; and
- A stable funding source for all stormwater activities.

Disadvantages of a stormwater utility program include:

- Implementation and administration workload and costs, including establishment of a billing system;
- A need for parcel-by-parcel evaluation of impervious area coverages; and
- The possibility that a new fee may not be well received by the public.

3.3 Comparison of Alternatives

Based on the discussion in the previous section, the various funding alternatives can be compared and evaluated for use in Greentown Borough. Table 3-1 lists each alternative and the stormwater management functions which can be addressed by the alternative.

Local improvement assessments and homeowners associations can be used to finance maintenance and capital improvements. The disadvantages are: (1) these funding mechanisms typically apply to only a portion of the Borough; (2) these funding mechanisms may not be capable of generating the required revenue; (3) revenues generated can be spent only in the area where collected, which is not necessarily where the funds are most needed; and (4) fees are based on property value and not on impact to, or use of, the stormwater management system.

A revenue bond is a financing tool that provides a large source of funds for construction, which would take other financing alternatives several years to accumulate. The major disadvantage is the long-term commitment of annual revenues to pay for the debt service. A pay-as-you-go sinking fund often prolongs the time to complete a project. Developer contributions within developments, developer contributions for off-tract improvements, and developer incentives are all one-time payments for constructing new stormwater facilities. These funding mechanisms cannot be used to correct existing drainage problems and cannot be used to provide continued maintenance of the facilities. Permits and fines are intended to cover only the cost of administration and enforcement and are not sufficient to fund either capital improvements or operation/maintenance programs.

Table 3-1

Alternative Funding Methods
Stormwater Management Activities

Funding Alternative	*Stormwater Management Administration and Design*	*Capital Improvement Program*	*Operation and Maintenance*
Stormwater Utility	x	x	x
General Fund	x	x	x
Local Improvement Assessments		x	x
Homeowners Association		x	x
Bonds		x	x
Pay-As-You-Go Sinking Fund		x	
Developer Contributions within Developments		x	
Contributions for Off-Tract Improvements		x	
Developer Incentives		x	
Penalties/Fines	x		
Fees/Permits	x		

A review of the benefits and deficiencies of each funding alternative indicates that the General Fund and a stormwater utility are the only two funding sources that can effectively support a stormwater management program on a borough-wide basis. The major distinction between the two alternatives is the method of allocating the costs for stormwater management. The General Fund is composed of revenues generated from ad valorem tax income based on property value, which does not correlate with the runoff contribution of the property or with the benefits received from the stormwater management system. Competition from other municipal programs for General Fund revenues often results in less than adequate funding for a stormwater management program.

With a stormwater utility, costs are allocated based on the quantity and quality of the stormwater that is generated by each property. A higher percentage of precipitation runs off impervious surfaces such as roofs and pavement than runs off pervious surfaces such as lawns and woods. In addition, stormwater that runs off impervious surfaces is more likely to carry significant quantities of pollutants than stormwater that runs off vegetated pervious surfaces. The relationship between the amount of impervious area and the quality and quantity of stormwater runoff is used to equitably allocate stormwater management costs. Therefore, the stormwater utility is the most equitable means of allocating stormwater management costs.

Section 4
Parcel Analysis

Several factors influence the amount of stormwater runoff generated by a particular parcel of land. The two most important are the size of the parcel and the amount of impervious area (i.e., the area that does not allow water to percolate). The purpose of this report is to estimate the amount of impervious area contained within the Borough limits and to evaluate how ownership is distributed between various categories.

A land parcel analysis was performed by the Engineering Consultant using data primarily derived from the assessor's information obtained from the Borough Assessor's office. When necessary, the assessor's data was supplemented as discussed below. The results of this analysis will be used to build the framework of the Borough's stormwater utility rate policy.

4.1 Sources of Information

4.1.1 Assessor's Records

A data file containing the assessor's information for parcels within Greentown Borough was obtained from the Borough Assessor in September 2003. The assessor's information provides some of the parcel data required to:

- Identify a customer base;
- Select an equitable rate policy; and
- Begin a customer database for the stormwater utility billing system.

A parcel refers to any contiguous property, lot(s), or land-tract under single ownership. The assessor's information for the majority of developed property parcels includes the total area of the parcel but generally does not contain information on the amount of impervious surface on the parcel.

4.1.2 Historical Information

Many studies on stormwater utilities are available in the literature. Information from these studies is compiled in a master stormwater database which can be used for comparison during this study. This historical information was used in this study to compare results and to close data gaps in the assessor's information.

4.1.3 Parcel Maps and Aerial Photographs

Greentown Borough provided their Stormwater Engineering consultant with parcel maps and aerial photographs. This information was used to develop sample statistics for residential parcels and for representative nonresidential parcels.

4.2 Parcel Analysis Method

The Engineering Consultant developed computer procedures to create a stormwater utility database from the assessor's information. Pertinent information from each of the 16,015 parcel records was

tabulated to create a record for each parcel in the stormwater utility database. Each record includes the following:

- Plat and Parcel identification number;
- Land use tax code;
- Owner name and address;
- A property address;
- Legal description;
- Impervious area of building; and
- Impervious area of other features.

The number that was not read directly from the assessor's information was the parcel's total impervious area. Instead, the total impervious area for each parcel record was approximated by estimating the impervious area for buildings and other improvements associated with the parcel. Improvements like fences, upper stories, and basements were not included in this estimate. Several computer programs were used to estimate impervious areas on parcels.

A statistical analysis was performed on the stormwater utility database once created. Statistics for both impervious area and land area were calculated for parcels in the land use classifications based on the land use tax code for each parcel. This analysis is summarized in Table 4-1 and graphically presented in Figure 4-1. The summary reduces the results of statistics for the land use descriptions into 12 land use categories. These 12 land use categories represent the following three broader categories developed from the land use tax codes: developed residential, developed nonresidential, and undeveloped properties.

The impervious area for each sample parcel was calculated using scaled measurements from the aerial photographs. Parcel maps were used to locate each parcel on the aerial. Once the impervious area was measured for each sample entry, statistics were developed to calculate the sample average impervious area per dwelling unit, sample standard deviation, and the 95 percent confidence interval.

4.3 Residential Property Analysis

Six residential classifications have been defined for this study: Single Family, Duplex, Multi-Family (3-6 dwelling units), Multi-Family (7+ dwelling units), Miscellaneous, and Condominiums. Each residential parcel record is assigned to one of these categories based on the reported land use tax code.

The assessor's information was sufficient to provide most of the information for the residential categories. However, since it appeared that residential impervious area estimated from the assessor's information was insufficient for the analysis, parcels were statistically selected to make available samples within the six residential categories to estimate residential impervious area.

Residential impervious area is an important parameter for the stormwater utility. Not only are 93 percent of the developed parcels residential, but the rate policy will use residential impervious area as

the basis for charges to nonresidential parcels. The statistical sampling process provides an accurate, defensible estimate for residential impervious area determinations.

The objective of the sampling process was to estimate the average impervious area per dwelling unit in each residential category with a 95 percent confidence interval that is within 10 percent of the average impervious area. The total impervious area is then estimated as the sample average times the total number of dwelling units in a category. Specific values developed for each category are displayed in Table 4-2.

4.3.1 Single Family Parcels

Single family parcels are identified in the assessor's files with land use tax code 1111. The assessor's information identifies 12,755 developed single family parcels in the Borough. From these parcels, 400 were randomly selected for the single-family sample. Impervious area was measured from the aerial photographs for each sample entry and then the entire sample was statistically analyzed as described above.

The sample average impervious area for single family parcels was estimated to be 2,675 square feet with a 95 percent confidence interval of 7 percent. In a broad range of studies, the average single family impervious area has ranged from a high of 3,296 square feet to a low of 1,541 square feet.

The total impervious area for single family parcels is calculated as the sample average (2,675 sq. ft.) times the number of parcels (12,755) for a total of 783 acres of impervious area. The impervious area for single family residences is approximately 80 percent of the total residential impervious area for the Borough.

4.3.2 Multifamily Parcels

Multifamily parcels are identified in the assessor's files with land use codes ranging from 1121 through 1139. Multifamily parcel includes any development with two or more residential units on a single parcel under single ownership. The assessor's information identifies 2,127 developed multifamily parcels in the Borough. From these parcels, 497 were selected for the multifamily sample. Impervious area was measured from the aerial photographs for each sample entry and then the entire sample was statistically analyzed as described above.

The sample average impervious area for multifamily parcels was estimated to be 1,451 sq. ft. with a 95 percent confidence interval of 7 percent. From many studies, the average multifamily impervious area per dwelling unit ranged from a high of 1,900 square feet to a low of 900 square feet.

The total impervious area for multifamily parcels is calculated as the sample average (1,451 sq. ft.) times the number of dwelling units (6,756) for a total of 225 acres of impervious area. The impervious area for multifamily residences is approximately 19 percent of the total average residential impervious area for the Borough.

The multifamily impervious area is compared to stormwater studies in other municipalities in the United States in Table 4-3. Impervious area includes the base living area and impervious amenities such as patios, parking lots, tennis courts, and other improvements.

4.3.3 Condominium Parcels

Condominium parcels are identified in the assessor's files with land use codes 1131 and 1133. The assessor's information identifies 7 developed condominium parcels in the Borough. From these

parcels, all were selected for the condominium sample. Impervious area was measured from the aerial photographs for each sample entry and then the entire sample was statistically analyzed as described above.

The sample average impervious area for condominium parcels is estimated to be 1,264 square feet with a 95 percent confidence interval of 7 percent. From many studies, the average condominium impervious area has ranged from a high of 3,800 square feet to a low of 500 square feet.

The total impervious area for condominium parcels is calculated as the sample average (1,264 sq. ft.) times the number of dwelling units (142) for a total of 4 acres of impervious area. The impervious area for condominium residences is less than 1 percent of the total average residential impervious area for the Borough.

In Table 4-3, the condominium impervious area is compared to stormwater studies completed in other cities. As with the multifamily category, impervious area includes the base living area, as well as impervious amenities such as patios, parking lots, tennis courts, and other improvements.

4.4 Developed Nonresidential Parcels

Developed nonresidential parcels in the assessor's information are coded as commercial. This category consists of 902 parcels. The parcels are further divided into commercial, industrial, institutional, governmental, and agricultural based on the land use code found in the assessor's data.

Nonresidential property is typically an important customer class for a stormwater utility because they generate a large portion of the utility revenue. In Greentown Borough, this customer class makes up 6 percent of the total number of developed parcels, but contributes 66 percent of the total impervious area for the Borough. Parcels in this group represent large developments and government complexes, including some that are tax-exempt. A total of 1,932 acres of impervious area is estimated for these categories. Since the Borough Assessor maintains parcel information for the valuation of property, the estimated impervious area for some parcels in this category may not be accurate enough for customized individual billing. Therefore, prior to billing the stormwater utility fee, the Engineering Consultant will need to verify the impervious area of all developed nonresidential parcels. Verification methods will include a combination of site measurements and scaled measurements from aerial photographs.

4.5 Undeveloped Parcels

Approximately 1 percent of the parcels in the Borough are reported to be undeveloped; however, many of these parcels may actually be developed. The Borough Assessor may not keep detailed improvement records on these parcels; therefore, the analysis presented in this report classifies the parcel as undeveloped. As a function of Phase II, it is important to verify the impervious area and land area for undeveloped parcels. This may include field measurements or scale measurements from aerial photographs.

4.6 Rights-of-Way/Easements

Drainage facilities such as swales, storm sewer pipes, and drainage ditches are usually located within road or drainage rights-of-way/easements. The interconnection of roadway and associated drainage facilities is significant. Roadway curbing and swale systems constitute a significant portion of the Borough's drainage system. Therefore, stormwater management utilities typically consider all road

rights-of-way and drainage facilities (federal, state, local) as components of the Borough's stormwater management infrastructure, and these areas are not charged stormwater utility fees.

4.7 Summary of Parcel Analysis

The parcel analysis of the assessor's file identified 16,015 individual parcels in Greentown Borough. Undeveloped parcels constitute approximately 1 percent of the total number of parcels in the Borough. Single family residential parcels make up 80 percent of all parcels, 27 percent of the total impervious area, and 65 percent of dwelling units. Condominiums comprise less than 1 percent of the parcels, less than 1 percent of the impervious area, and less than 1 percent of the dwelling units. Multifamily developments comprise approximately 13 percent of the total number of parcels, 6.6 percent of the total impervious area, and 35 percent of the dwelling units.

Nonresidential parcels make up 6 percent of the parcels, but account for 66 percent of the total impervious area of the Borough. The average nonresidential parcel could contain approximately 30-40 times as much impervious area as an average single family residence in the Borough.

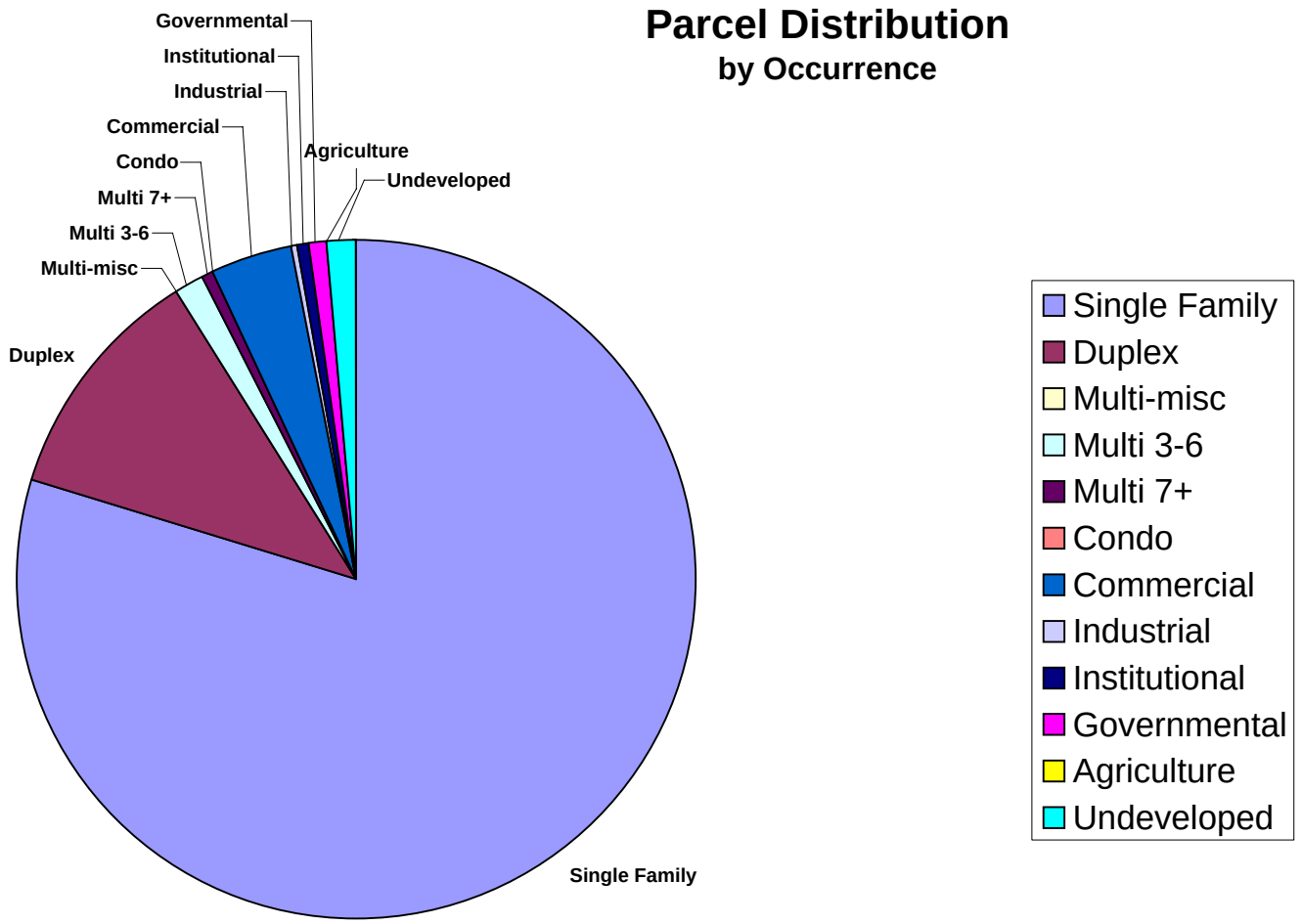

Parcel Distribution
by Occurrence
Governmental
Institutional
Industrial
Commercial
Condo
Multi 7+
Multi 3-6
Multi-misc
Agriculture
Undeveloped
Duplex
Single Family
Single Family
Duplex
Multi-misc
Multi 3-6
Multi 7+
Condo
Commercial
Industrial
Institutional
Governmental
Agriculture
Undeveloped

Figure 4-1

Table 4-1

Parcel Summary by Land Use Category

Greentown Borough

Land Use Category	Total Number of Parcels	Percentage of Total Parcels
Single Family	12,755	79.64%
Duplex	1,820	11.36%
Multi-misc	17	0.11%
Multi 3-6	225	1.40%
Multi 7+	65	0.41%
Condo	7	0.04%
Commercial	634	3.96%
Industrial	58	0.36%
Institutional	62	0.39%
Governmental	148	0.92%
Agriculture	0	0.00%
Undeveloped	224	1.40%
Totals	**16,015**	**100.00%**

Table 4-2

Parcel Analysis by Land Use Category
Stormwater Utility
Greentown Borough

Land Use Category	Total Number of Parcels	Estimated Total Impervious Area	Average Impervious Area (sq.ft.)	Number of Dwelling Units
Single Family	12,755	34,120,545	2,675	12,755
Duplex	1,820	5,613,713	1,542	3,640
Multi-misc	17	88,190	2,384	37
Multi 3-6	225	920,850	1,070	861
Multi 7+	65	1,794,176	809	2,218
Condo	7	179,444	1,264	142
Commercial	634	19,089,734	30,110	0
Industrial	58	24,296,026	418,897	0
Institutional	62	26,320,694	424,527	0
Governmental	148	14,461,920	97,716	0
Agriculture	0	0	0	0
Undeveloped	224	0	0	0
Total	**16,015**	**126,885,293**		**19,653**

Base Unit = 2,174

Table 4-3

Average Dwelling Unit Impervious Area for Selected Cities
Stormwater Utility Study
Greentown Borough

Stormwater Study Area	Multifamily (sq. ft.)	Condominium (sq. ft.)
1. Hudson, Ohio	2,686	N/A
2. Duluth, Minnesota	1,200	1,245
3. Topeka, Kansas	1,306	1,132
4. Fairfax County, Virginia	1,968	875
5. Des Moines, Iowa	1,400	1,400
6. Warren, Ohio	1,212	2,576
7. Chesapeake, Virginia	1,154	1,921
8. Virginia Beach, Virginia	1,011	1,432
9. Newport News, Virginia	929	861
10. Wichita, Kansas	1,251	2,385
11. City of Daytona Beach, Florida	1,390	1,645
12. City of Ocala, Florida	1,250	1,450
13. City of Kissimmee, Florida	1,500	1,500
14. Borough of Greentown, New Jersey	**1,451**	**1,264**

Section 5
Rate Policy

5.1 Introduction

The stormwater utility is a funding alternative developed to allocate an equitable share of the costs for stormwater management to all customers in Greentown Borough. Stormwater utilities typically base cost allocations on the stormwater runoff characteristics for land parcels by customer. The amount of runoff from each land parcel is proportional to the services provided by the utility. History of flood damage is not required for property to be served by a stormwater management system. All properties contribute runoff to the drainage system regardless of flooding potential. This runoff must be safely transported by the Borough's drainage system to prevent flooding of structures and roadways. Additionally, new federal and state stormwater permitting requirements focus attention on the water quality impacts from runoff.

The most fundamental requirement of any utility system is equity - ensuring that the benefits received are consistent with the fair share of cost.

Several factors influence the amount of stormwater generated by a particular parcel of land, including the size, soil type, topography, impervious area, and the development intensity. Analysis of rainfall events used in stormwater management planning and design has shown that the amount of impervious area is the most important parameter affecting the quantity and quality of runoff. Since this value is easily quantified, rate policies developed for stormwater management utilities should have a primary focus on the amount of impervious area to determine the procedure for allocating costs to utility customers. Impervious area of a parcel refers to surfaces which have been covered with material (including structures) that are highly resistant to the infiltration of water. For example, rooftops, pavements, and building footprints are impervious surfaces.

The most fundamental requirement of any utility system is equity - ensuring that the benefits received are consistent with the fair share of cost. In the case of a stormwater utility, the primary benefits are measured in terms of reduced flooding and enhanced water quality throughout the area served by the utility. Inevitably, additional direct benefits are received by some individuals as a result of reduced flooding and increased property values, but the primary purpose of a stormwater management program is to provide community-wide control and management of stormwater. Equity is achieved by basing the stormwater utility fee on the user's impervious area which is directly related to runoff contribution, independent of the location of actual runoff.

Based on experience gained in other stormwater utility studies, the most convenient and equitable unit for establishing a stormwater utility fee is based on a residential billing unit. A residential billing unit is defined as the average impervious area of residential dwelling units. This includes patios, driveways, sheds, etc., which are associated with a residence in addition to the impervious area of the dwelling structure. A residential billing unit is often chosen for the stormwater utility because it describes the largest group of customers and is generally uniform in runoff potential. Therefore, this group provides a base for establishing the relative runoff potential for all other property and simplifies utility administration.

The residential unit approach is consistent with other types of user fees in that the fee is based on the rate of use (potable water) or generation rate (solid waste), but the rate is independent of the user's distance from the facility providing the service. In most cases, there is a base rate (e.g., 6,000 gallons/month; two 30-gallon cans per pickup) for all residential customers, and another rate structure for nonresidential users. The base rate reflects the need to balance complete equity with the administrative cost of billing for the service provided. Typically, this balance is achieved by a rate structure that distinguishes between major differences in use (or generation), but simplifies administrative costs by establishing a series of user classes.

5.2 Stormwater Utility Rate Policy

The rate policy developed for the Borough for allocating the cost of stormwater management is the equivalent residential dwelling unit (ERU). Dwelling units include single family units, multifamily units (duplexes, triplexes, quadplexes, and apartments), and condominiums. This rate policy is referred to as the ERU rate policy and its base and billing units are referred to as ERUs. Calculation of the ERU base unit is shown in Table 5-1. The ERU average impervious area of 2,174 square feet is compared in Table 5-2 for Greentown and other communities.

Under the ERU rate policy, all residential units, regardless of residential class, would be charged one equivalent residential unit (1 ERU). Nonresidential customers would receive a bill determined by dividing their total impervious area by the average impervious area for all residences.

The equivalent residential dwelling unit rate policy is based on a concept used in stormwater engineering known as directly connected impervious area (DCIA). DCIA represents the portion of impervious area that contributes runoff directly to surface water conveyance systems (i.e., street gutters, storm sewer pipes, ditches, culverts, streets, etc.), and is a better indicator of the stormwater runoff impact of a given parcel than is the total impervious area of a parcel.

When detailed hydrologic analyses are conducted, the percentage of DCIA from a contributing area becomes very important in calculating surface runoff and subsequent flow contributions to channels. The typical percentage of DCIA to total impervious area ranges from 20 to 60 percent for single family residential neighborhoods and from 60 to 90 percent for higher density multifamily residential and commercial neighborhoods. Given equal areas of impervious surfaces, non-single family residential property will have between 1.00 and 4.50 (60/60 = 1.00 to 90/20 = 4.50) times more DCIA than single family property.

Even though the average non-single family residential dwelling unit may have less impervious area than the average single family residence, its contribution to stormwater runoff is similar to the single family residence due to its greater amount of DCIA. This is illustrated in Figure 5-1.

Dividing the total impervious area in each residential class by its corresponding number of dwelling units shows that the impervious area per dwelling unit ranges from 1,451 square feet for multifamily, to 1,264 square feet for condominium units, and to 2,675 square feet for single family units, a range of 1,491 square feet.

The values in Figure 5-1 were based upon the type of development within Greentown Borough. When the impervious area is adjusted for DCIA, the multifamily dwelling units contribute 1,088 square feet, the condominium dwelling units contribute 1,011 square feet and single family homes contribute 1,070 square feet. This reduces the difference to 77 square feet, an area approximately 9 feet by 9 feet. Thus, there is little significant hydrologic difference in the DCIA adjusted impervious areas for

the various residential classes. Stormwater utility charges based on the equivalent residential dwelling unit rate policy incorporate this higher contribution from property with more DCIA.

5.3 Base Unit and Charge

The equivalent residential dwelling unit rate policy defines the base unit as the average impervious area per residential dwelling unit. For Greentown, the base unit (ERU) is estimated to be 2,174 square feet as shown in Table 5-2. In implementing the equivalent residential dwelling unit rate policy, each dwelling unit (single family residence, apartment, or condominium) would be assigned 1 ERU.

Revenue from a nonresidential parcel would be assessed according to the ratio of its impervious area to that established for a single ERU. As an example, the utility fee for a typical office building depicted in Figure 5-2, with an impervious area of 50,000 square feet would be 22.9 ERUs (50,000 square feet divided by 2,174 square feet per ERU = 22.9 ERUs).

5.4 Defining a Uniform Rate Policy

As with other utility programs, residential customers are the largest single user class in the stormwater utility. Rate policies must reflect an equitable fee that will recover the costs of the services provided. In Greentown Borough, residential customers make up over 93 percent of the stormwater utility customers.

As shown in Tables 4-2 and 5-1, there is variability in the type of construction (single family, condominiums, apartments, etc.), impervious area of each residence, and the number of dwelling units per acre. Examination of the impact that these variables have on the runoff potential reveals that: (1) the variability is not significant hydrologically; and (2) there are many combinations of these factors that will result in similar stormwater impacts.

These same issues arise in other utility programs. In a water utility, rates do not reflect the additional pumping costs incurred to supply water to customers on top of a hill. Likewise, the customer closest to the well is not charged a lower rate because his water is not pumped as far as the rest of the customers. In solid waste utilities, rates are often the same for residential customers who generate different volumes, even though they are in the same residential category. For example, one customer generates six bags of garbage per week while another customer generates one bag per week.

Determining the cost of providing stormwater services is just as difficult. A short storm sewer may be able to service many multifamily customers, but because of the large amount of DCIA, the storm sewer may be double the size required for a subdivision with the same number of customers. Residential customers on lots larger than an acre may not generate runoff at the same rate as those on the more typical parcel. However, the Borough will be called upon to construct and maintain many more feet of storm sewer pipes or swales to provide the same level of service to those customers as that provided to other residential customers.

It is technically and administratively prohibitive for the utility rate policies to reflect all of the variables associated with providing service to each utility customer. Therefore, there is justification for creating a single customer class that includes all residential dwelling units.

The equivalent residential dwelling unit rate policy defines a uniform rate for all residential dwelling units. This is equitable when considering the narrow spread of DCIA for residential dwelling units in Greentown. More important, the variability among residential dwelling units does not produce significantly different runoff impacts. The policy that uses the average impervious area to represent

the residential dwelling unit population is appropriate and reasonably accurate. Furthermore, the administrative burden and cost are significantly reduced by grouping residential properties in one class.

In summary, the equivalent residential rate policy has several advantages:

- The ERU more equitably distributes costs to residential customers by accounting for the greater amount of directly connected impervious area (DCIA) from non-single-family residential customers; and

- The ERU is much simpler to administer since residential customers are grouped into one class. The ERU policy would require verification and maintenance of only 1,150 records.

Therefore, the equivalent residential unit rate policy is recommended for Greentown Borough. The foundation of this rate policy is that all residential customers have similar benefits. This rate policy is used in the following sections of this report for estimating revenue alternatives and is summarized in Table 5-3.

5.5 Undeveloped Land

Based on the engineering evaluation of Greentown Borough's parcel data, approximately less than 1 percent of the total land area in the Borough appears to be undeveloped. Although they generally contribute less stormwater than developed parcels, undeveloped property also contributes stormwater runoff to the system. Because some of the undeveloped parcels are building lots in residential neighborhoods, their runoff contribution and impacts will exhibit some characteristics similar to those of nearby developed residential parcels.

The stormwater utility fee is particularly well suited for developed property runoff and stormwater services typically provided to developed parcels. While there is runoff from undeveloped parcels and there are some services provided to undeveloped property, the relationship between the benefits received by the undeveloped parcel and the fees paid is not as clear as with developed parcels. Therefore, requiring undeveloped parcels to pay is premature, and at this time, it is recommended that undeveloped parcels not be included in the utility customer base.

5.6 Utility Rate Adjustment Policy

The maintenance of a stormwater management system for public health, safety and welfare is a borough-wide responsibility. Adjustments, if awarded, should be based on the avoided cost to the Borough's stormwater utility program. In any instance, the method of awarding adjustments should be handled on a case-by-case basis.

Utility rates are established to cover the following component costs of the Borough's stormwater management program: (1) administration, (2) operation/maintenance, (3) replacement/renewal of the existing system, and (4) new capital projects. The Borough's stormwater management system has been constructed and maintained for the health, safety and welfare of everyone in the Borough. Each individual in the Borough has an obligation to pay for an equitable share of the upkeep of the system (i.e., the cost of administration and operation/maintenance). The costs for replacement/renewal of those portions of the stormwater system which the Borough has outgrown or which no longer functions properly are also a borough-wide responsibility.

Adjustment should result only from direct savings to the Borough's stormwater management program. It is common for the Borough or State to require developers to install Best Management Practices (BMP's). The fact that stormwater systems are constructed in fulfillment of the Borough's or state's regulatory requirement is not sufficient justification for granting adjustments, nor does it preclude the developer from paying the stormwater utility fee. Adjustments should be considered only if the system constructed allows the Borough to: (1) perform maintenance less frequently, (2) avoid construction of a Borough-identified capital improvement project, and (3) eliminate expenditures for certain functions.

In order to have a firm technical basis, the user-fee reduction for Greentown's stormwater utility program must be related to the benefits achieved by the private stormwater control facility that is the basis for the reduction. The Borough's Stormwater Management Program costs can be subdivided into two general categories:

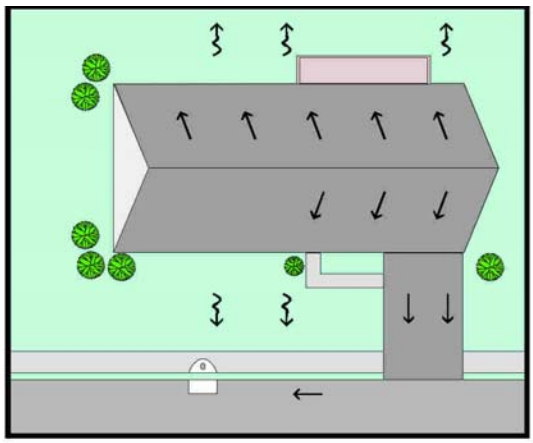
- Program costs which have localized or "local" benefits; and
- Program costs which have "system wide" benefits.

Typically, stormwater management facilities for urban development projects provide primarily localized benefits. For example, because stormwater detention basins for development projects control a relatively small percentage of major Borough watersheds, the peak flow control benefits are typically limited to stream systems immediately downstream of the development site. Since it is unlikely that privately maintained stormwater control facilities significantly reduce the Borough's system wide costs, it is appropriate to express the benefits of these facilities in terms of potential reductions in the Borough's "local" program costs.

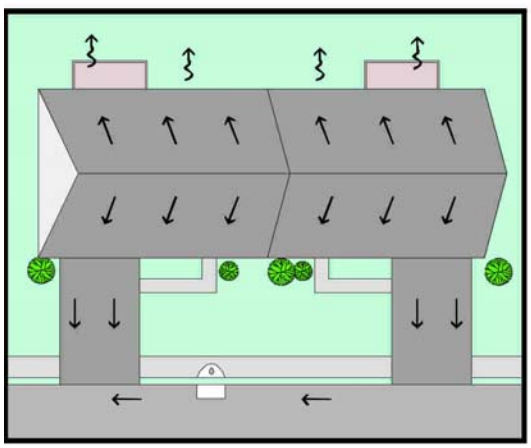
Therefore, the recommended approach to establishing a technical basis for the Borough's adjustment policy is to base the "maximum total adjustment" (i.e., maximum user fee reduction) on the total percentage of Borough program costs which provides "local" benefits. Likewise, the breakdown of the maximum total adjustment percentage between "peak flow control" and "water quality control" can be based upon the percentage of Borough program costs allocated to each of those functions.

The adjustment factors require evaluation of the programmatic budgets for a reasonable period of time to reflect overall costs. Table 5-4 presents the preliminary estimate of potential adjustments based upon the projected budgets presented in Section 2 for fiscal years 2005 through 2009. As indicated in this example, the maximum reduction for normal stormwater management facilities on private property would be approximately 33 percent.

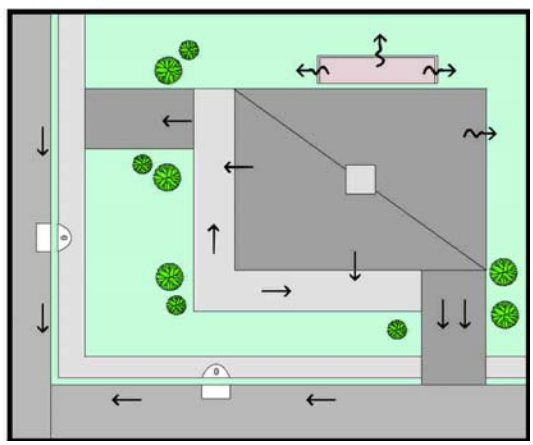
As a result of the discussions conducted during this evaluation, it is recommended that a policy be developed during the implementation phase of the utility. Numerous factors must be considered and a consensus needs to be formed with representatives throughout the Borough.



Single Family Residence
DCIA Factor = 40%
DCIA = 0.40 x 2,675
= 1,070 sq. ft. per unit



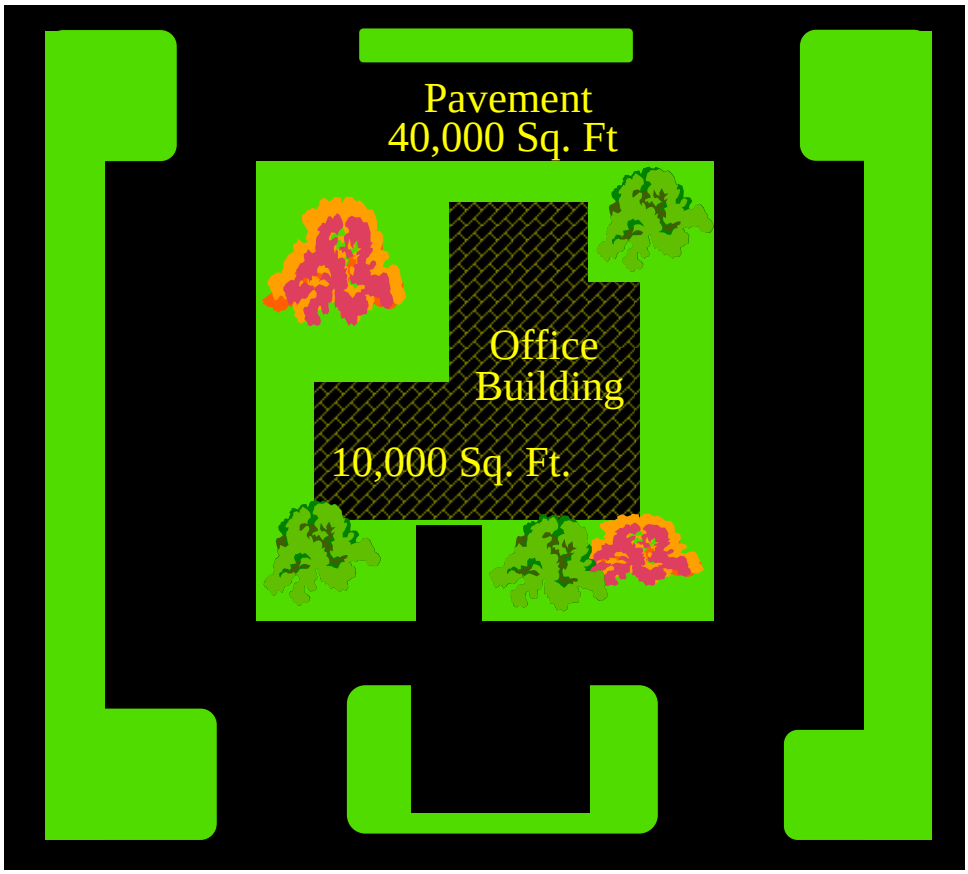
Multi-Family Residence
DCIA Factor = 75%
DCIA = 0.75 x 1,451
= 1,088 sq. ft. per unit



Condominiums
DCIA Factor = 80%
DCIA = 0.80 x 1,264
= 1,011 sq. ft. per unit

Figure 5-1
Comparison of Impervious Area and
Directly Connected Impervious Area (DCIA)
Greentown Borough

Stormwater Utility Fee Calculation
Non-Residential Property



$$\frac{10{,}000 \text{ Sq.Ft} + 40{,}000 \text{ Sq.Ft.}}{2{,}174 \text{ Sq. Ft./ERU}} = 22.9 \text{ ERUs}$$

Figure 5-2

Table 5-1

ERU Calculation
Data Summary from Residential Parcel Analysis
Stormwater Utility
Greentown Borough

	Number of parcels	Number of units	Estimated Impervious Area
Single Family	12,755	12,755	34,120,545.1
Duplex	1,820	3,640	5,613,713.4
Multi-misc.	17	37	88,190.0
Multi 3-6	225	861	920,850.0
Multi 7+	65	2,218	1,794,176.0
Condo	7	142	179,444.2
Total	**14,889**	**19,653**	**42,716,918.7**

Base Unit Calculations

$$\text{ERU} = \frac{\text{Total Residential Impervious Area}}{\text{Total Number of Dwelling Units}}$$

$$\text{ERU} = \frac{42{,}716{,}918.70}{19{,}653}$$

ERU= 2,174 sq.ft./Dwelling Unit

Table 5-2

Comparison of Cities

Location	Base ERU Value (square feet)
Glendale, Wisconsin	2,609
Warren, Ohio	2,232
Wichita, Kansas	2,139
St. Louis, Missouri	2,076
Des Moines, Iowa	2,054
Topeka, Kansas	2,018
Newton, Kansas	2,482
Duluth, Minnesota	1,708
Dublin, Ohio	2,428
Wauwatosa,WI.	2,174

Table 5-3

Parcel Analysis
ERU Summary by Land Use Category
Stormwater Utility
Greentown Borough

Land Use Category	Total Number of Parcels	Estimated Total Impervious Area	Average Impervious Area (sq.ft.)	Number of Dwelling Units	Rate Policies: Equivalent Residential Units	
					Revenue Base ERUs	Percent of Total ERUS
Single Family	12,755	34,120,545	2,675	12,755	12,755	21.85%
Multi-Family	2,127	8,416,929	1,451	6,756	6,756	11.57%
Condo	7	179,444	1,264	142	142	0.24%
Commercial	634	19,089,734	30,110	0	8,783	15.04%
Industrial	58	24,296,026	418,897	0	11,178	19.15%
Institutional	62	26,320,694	424,527	0	12,110	20.74%
Governmental	148	14,461,920	97,716	0	6,654	11.40%
Agriculture	0	0	0	0	0	0.00%
Undeveloped	224	0	0	0	0	0.00%
Total	**16,015**	**126,885,293**		**19,653**	**58,377**	**100.00%**

Base Unit = 2,174

Table 5-4

Greentown Borough
STORMWATER MANAGEMENT PROGRAM
FUNCTIONAL COSTS
5 YEAR* TOTAL

FUNCTIONAL AREA	TOTAL COST	PERCENT	ALLOCATION FOR SYSTEMWIDE COST/IMPACTS	ALLOCATION FOR LOCAL SYSTEM COST/IMPACTS
ADMINISTRATION	$1,187,594	9.2%	8.5%	0.7%
ENGINEERING/PLANNING	$1,539,851	11.9%	7.3%	4.6%
OPERATIONS & MAINTENANCE	$3,790,129	29.3%	13.9%	15.4%
CAPITAL	$6,424,731	49.6%	37.4%	12.2%
TOTAL	**$12,942,305**	**100.0%**	**67.1%**	**32.9%**

*Years 2005 - 2009

Section 6
Revenue Analysis and Parcel Impact

6.1 Introduction

In considering the establishment of a stormwater management utility, Greentown Borough acknowledges the increased importance of proper stormwater management in its community. Stormwater management can no longer be thought of as simply drainage. Stormwater facilities must provide both flood protection and water quality enhancements. To address these concerns, a comprehensive approach to stormwater management is necessary, including: (1) program management; (2) operation/maintenance; (3) planning, and engineering/design; (4) regulatory permitting; and (5) a reliable funding source.

Currently, these activities are the responsibility of the Public Works Department, the Planning Board and the Zoning Board (as described in Section 2). Table 2-4 summarizes the fiscal year 2003 budgeted stormwater requirements. The ability to finance the existing stormwater program and the components of a future stormwater management program is the key to the program's success. Competition for the Borough's general revenue funds makes it difficult to provide the level of service desired by the Borough using only existing general revenues. In many communities, a dedicated funding source in the form of a stormwater utility has been considered the best way of financing the desired level of service. With each investigation, the impact upon property owners must also be addressed.

6.2 Revenue Potential

Based on this analysis, the estimated annual revenue that could be generated by a stormwater utility in Greentown Borough was identified for various rates. The estimates assume that 3 percent of the potential revenue will go uncollected due to errors in billing, and adjustments. These calculations are based on an equivalent residential unit (ERU) base of 2,174 sq. ft. Assuming a revenue base of 58,000 ERUs, each dollar charged per ERU per month would generate a projected $670,000 per year.

Potential Annual Revenue

Rate ($/ERU/month)	Annual Revenue ($/year)
1.00	670,000
2.00	1,350,000
2.50	1,680,000
3.00	2,020,000
3.50	2,360,000
4.00	2,700,000

Assumes a revenue base of 58,000 equivalent ERUs. Also assumes a collection rate of 97 percent to discounts and bad debt.

Many alternatives were illustrated and discussed at length with the Stormwater Advisory Committee during 2003/2004. At the conclusion of the sixth meeting, the Committee agreed upon funding the program at approximately $2,600,000 per year. In order to support this value, the ERU rate would need to be approximately $4.00/ERU/month. If approved by the Borough Council, the final rate will be determined during the implementation phase of the utility. As all other items are finalized, the budget process will establish the final expenditures during September through November 2004.

6.3 Parcel Impact

During the Committee's deliberations, the representatives requested that their Engineering Consultant develop relative cost impacts upon specific parcel types throughout the community. Table 6-1 displays approximately 30 specific parcels identified by the Borough Administration and the Committee members. The approximate assessed value was obtained from the Borough Assessor's office and the corresponding portion of that parcel's property tax was identified for the $2,000,000 and $2,600,000 annual stormwater programs. These values represent the portion of taxes that would be necessary from these assessed parcels to support these levels of expenditures.

Following the user charge process developed in Sections 4 and 5, the approximate impervious area and corresponding number of ERUs were generated for each parcel. As identified in Section 6.2, the relative rates for each annual budget would be $3.00/ERU/month and $4.00/ERU/month. Multiplying the number of ERUs times the monthly rate and then multiplying by 12 months would generate the annual fee for the stormwater utility. The last two columns then present the increase or the decrease in payment from that parcel owner when compared to the property tax value.

As seen from these comparisons, no specific relationship can be developed since the number of ERUs and assessed property value are not related to the same variable. The only conclusion that is clear is that the typical residence single family parcel will save money with a stormwater utility fee, while all tax-exempt parcels will pay more money with a stormwater utility fee.

Table 6-1
Greentown Borough
Sample Properties

Parcel "Name"	Approximate Impervious Area	Number of ERU's	Fee $3.00 Per ERU/Mo	Annual Fee	Fee $4.00 Per ERU/Mo	Annual Fee
Jefferson Elementary	54,300	25.0	$75	$899	$100	$1,199
Longfellow Middle School	257,300	118.4	$355	$4,261	$473	$5,681
Greentown High School	533,800	245.5	$737	$8,839	$982	$11,786
Mount Zion Evangelical Lutheran Church	48,600	22.4	$67	$805	$89	$1,073
Sacred Heart Roman Catholic Church	113,300	52.1	$156	$1,876	$208	$2,502
Calvary Memorial United Church of Christ	73,600	33.9	$102	$1,219	$135	$1,625
Currie Park	205,300	94.4	$283	$3,400	$378	$4,533
PSE&G Power Plant	89,100	41.0	$123	$1,475	$164	$1,967
Municipal Complex	209,400	96.3	$289	$3,468	$385	$4,623
Fire Station #2	27,000	12.4	$37	$447	$50	$596
Hart Park	338,500	155.7	$467	$5,605	$623	$7,474
N. 64th St Pump Station	4,800	2.2	$7	$79	$9	$106
NJ Transit Railroad Yard	1,953,000	898.3	$2,695	$32,340	$3,593	$43,121
Mayfair Mall	3,666,000	1686.3	$5,059	$60,707	$6,745	$80,942
Ravenswood Strip Mall	68,800	31.6	$95	$1,139	$127	$1,519
Promenade Strip Mall	131,000	60.3	$181	$2,169	$241	$2,892
40 Winks Inn	23,800	10.9	$33	$394	$44	$525
Midway Hotel	168,850	77.7	$233	$2,796	$311	$3,728
R&B Wagner/Advance Stamping	138,400	63.7	$191	$2,292	$255	$3,056
Mobil Gas	25,600	11.8	$35	$424	$47	$565
Giant Catalog Center & Warehouse	3,436,000	1580.5	$4,741	$56,898	$6,322	$75,864
Alioto's Restaurant	93,075	42.8	$128	$1,541	$171	$2,055
Office/Professional Bldg.	78,000	35.9	$108	$1,292	$144	$1,722
The Manor	592,965	272.8	$818	$9,819	$1,091	$13,092
Shoprite Supermarket	40,600	18.7	$56	$672	$75	$896
Pick"N" Save	181,950	83.7	$251	$3,013	$335	$4,017
Dodge City	150,000	69.0	$207	$2,484	$276	$3,312
United States Post Office	96,450	44.4	$133	$1,597	$177	$2,130
McDonald's	42,000	19.3	$58	$695	$77	$927
Lakeview Hospital	682,100	313.8	$941	$11,295	$1,255	$15,060
Saint Jude Congregation	144,000	66.2	$199	$2,385	$265	$3,179
Briggs and Stratton	4,018,248	1848.3	$5,545	$66,540	$7,393	$88,719
Empire Fish	44,700	20.6	$62	$740	$82	$987

ERU = 2174 sq.ft.

Section 7
Implementation

7.1 Introduction

The implementation and integration of the stormwater utility program for mythical Greentown Borough would require the following four actions: (1) adoption of an ordinance and resolution establishing the utility and rate structure, (2) development of procedures to bill and collect the utility revenues, (3) coordination with Greentown Borough Utility Department to administer the billing and collection of the stormwater utility, and (4) verification of the billing information to include parcel identification, addresses, and customer names. Establishment of a separate Borough department for stormwater management is not necessary at this time. However, once the utility has been established and the level of service has increased, a separate department or a new division within an existing department may be considered for administration and accounting purposes.

7.2 Stormwater Advisory Committee

The Stormwater Advisory Committee (SWAC) was established by the Mayor in mid-2003. The inaugural meeting was held on September 15, 2003. The Advisory Committee was established to assist the Borough in determining whether a stormwater utility is the best solution for funding stormwater needs. The membership of the Committee was as follows:

Member	Representing
Ms. Susan Colletti	Green County Engineering Department
Mr. Paresh Patel, Jr.	New Jersey Department of Environmental Protection
Ms. Maria Rodriguez	Greentown Regional Medical Center
Mr. Ken Elert	Greentown Chamber of Commerce
Mr. Bernard Levin	Individual
Mr. David Cedrowski	Greentown Economic Development Corp.
Ms. Linda James	Neighborhood Association Council
Mr. Arthur Williams	Greentown School District
Mr. William Chernik	New Jersey Electric & Power Company
Mr. James Chen	Greentown Senior Citizen Advisory Board
Ms. Anne Neudorfer	Briggs and Stratton
Mr. Stephen Spallone	Mayfair Mall
Mr. Carl Menendez	Greentown Village BID District
Mayor Maricolette Walsh	Greentown Borough

From September 2003 through March 2004, Borough staff and their Engineering Consultant held monthly meetings with the Advisory Committee to discuss all elements associated with stormwater issues. During this timeframe, various "policy" decisions were made with the major decisions summarized in the document entitled "Recommendations to Borough Council", dated March 10, 2004, and reads as follows:

- The Greentown Borough Council approves a proposed stormwater budget of approximately $2,600,000 for Fiscal Years 2005 through 2009. The SWAC has reviewed the stormwater

program expenditure level totaling $2 million with additional future anticipated costs of about $600,000 to support the large backlog of capital projects and unfunded state requirements resulting in increased operation and maintenance throughout the system. SWAC finds these expenditures to be reasonable and recommends they be used as a basis for establishing a stormwater utility.

- The Greentown Borough Council adopts the user fee concept to support the entire proposed stormwater budget beginning January 1, 2005 in a manner satisfactory to the Borough. With the user fee concept, the future tax levy would not include the amount financed by the stormwater utility.

- The Greentown Borough Council authorizes the Engineering Department to manage the implementation of the user fee concept to allow the initial billing to become effective January 1 of the year 2005. Within this authorization, the Engineering Department will coordinate the necessary department activities and consultant activities to efficiently and effectively accomplish this process.

- The Greentown Borough Council adopts an ordinance for the stormwater utility which includes the development of an adjustment policy. Within this policy, the Engineering Department should be directed to include appropriate allowances that reduce fees from different properties when those properties provide stormwater services that reduce the Borough's cost for the stormwater program.

- The Greentown Borough Council continues to support the stormwater management planning process by authorizing the Engineering Department to complete the subwatershed planning for the entire Borough in cooperation with other jurisdictions. The necessary expenditures for this process are included in the proposed five year budget projected for the stormwater program.

- The Greentown Borough Council authorizes the appropriate Borough staff to begin implementation of the above activities in June 2005.

7.3 Stormwater Utility Ordinance and Rate Resolution

The stormwater utility ordinance establishes the procedures for developing just and equitable user rates, as well as procedures for collecting delinquent bills. The Borough's Utility Department plans to issue the bills for the stormwater utility fee. Nonpayment of the stormwater fee will result in a lien or charge being placed against the property. The ordinance will establish a stormwater utility special revenue fund into which the utility fees are deposited. The ordinance will identify the equivalent residential unit (ERU) as the method for defining a utility base unit. Provisions in the ordinance for any customer to appeal the charge should be established by the utility. The stormwater rate resolution establishes the rates to be charged to each user classification. The Borough Attorney is responsible for the creation of and modifications to the ordinance and rate resolution prior to formal reading and adoption by the Borough Council.

7.4 Billing Method

The implementation of the stormwater utility program will require the establishment of a mechanism for billing, collection, and administration. The recommended method for collecting the utility fees is to append the stormwater utility fee to the Borough's utility bill.

Incorporating the stormwater utility fee in the existing billing mechanism offers several advantages. First, the current billing mechanism is an established, fully operational system which can incorporate the additional line item and the associated functions. Second, the administrative operations (printing, mailing, and receipt processing) are in place. Integrating the utility fee in the existing billing system allows for sharing of the administrative costs among the different departments.

Master Meters

Master meters monitor service to more than one user. The stormwater bill should be handled in the same fashion. However, the Borough may be requested to allocate the stormwater bill to the various occupants of the property. This allocation of the stormwater bill and the addition of new stormwater accounts will tend to increase the complexity of the billing system.

Multiple Meters

Many parcels have multiple meters or meters separate from each building on the property such as an extra water line or fire protection or separate meters for each building on the property. In any case, a single stormwater charge should be calculated for the property. Where there is a single customer, the procedure would be to assign the stormwater bill to one meter and reference this fact on the remaining accounts.

This procedure becomes more complicated, however, in a case where there are multiple customers. Each customer on a parcel must be allocated an equitable share of the stormwater utility bill. The procedure for allocating the bill should be fairly simple so that an undue burden is not placed on the utility system. A factor should be established for each of the stormwater accounts which represents the percentage of the stormwater bill assigned to that account based on the relative size of the residence or place of business.

Inactive Accounts

Inactive utility accounts (i.e., no one occupying the residence) typically constitute between 5 and 10 percent of the total installed meters. This would be an appropriate time to review the current policy of not charging inactive accounts and possibly make an exception for the stormwater utility. The argument is that the property is still receiving the benefit of the utility even though there is no one occupying the address. Unlike water and sewer service, the fact that the parcel is unoccupied does not mean that the parcel is not contributing to the Borough's stormwater management problem. In this sense, an inactive account is similar to a developed unmetered parcel, which is recommended to be billed as a regular customer. Since commercial and industrial parcels make up a very large portion of the revenue base for the stormwater utility, a single large unoccupied retail store or warehouse could represent a substantial loss in revenue. There are three options to address this issue: (1) continue to bill inactive accounts with the bill going to the owner of the property, (2) charge the owner a minimum service fee, or (3) do not charge inactive accounts.

Developed Unmetered and Undeveloped Property

New accounts should be established for developed properties which for one reason or another do not have a utility account. A parking lot would be an example of this type of development. A parking lot produces large quantities of stormwater and should receive a stormwater bill. Another example would be the Green County properties that receive water service from the County and will have to be billed differently. However, the property will not likely show up in the current billing system since there may not be a meter installed on the property.

7.5 Data Management

Once the initial billing system for the stormwater utility has been established, there must be a data management system. Routine updates would be done only when there is a change in the impervious area or number of dwelling units assigned to a particular account.

A long-term data management program is required to update file records as new development occurs. This will require the Utility Department to coordinate with the Engineering and Building Departments. As new building permits are issued, applicants should be required to report total impervious area and a parcel identification number. Once verified by the building inspectors and/or public works personnel, the stormwater utility files would be updated with utility bills. The second component is the modification of accounting procedures to accommodate the stormwater bills. The final component is the modification and printing of new bills.

7.6 Stormwater Utility Implementation

Implementing the stormwater utility as part of the Borough's utility system can be broken down into six major tasks. The following outline lists the work efforts required for integrating the stormwater utility data into the existing utility billing system.

Task I	Computer Sorting of Utility Accounts and Parcels
Task II	Verification of Impervious Area
Task III	Matching of Parcels to Utility Accounts
Task IV	Field Verification of Accounts and Parcels
Task V	Integration of Utility Billing System
Task VI	General Coordination and Administration

The objectives of Tasks I through IV are to verify estimates of impervious areas and to match utility accounts with parcels so that the proper number of ERUs can be assigned to each account. Task V is the actual modification of the computerized billing system to include the stormwater utility bill. The last task incorporates the nonspecific activities associated with general coordination and administration, with particular emphasis upon establishing an adjustment policy. Based on experience throughout the country implementing stormwater utilities, the implementation phase typically is a four to nine month process. The approximate cost for outside services to assist the Borough will range from $100,000 to $150,000, depending upon Borough personnel involvement in parcel verification and public participation.

The procedure for verifying data and matching parcels with utility accounts (Tasks I through III) is a time-consuming process. Task I involves sorting all of the parcels and utility accounts by address to facilitate the matching procedure.

The second task requires individuals to verify the impervious area of all nonresidential parcels. Based on experience establishing other stormwater utilities, it is estimated that this task would require four months to complete.

The third task is to match the corresponding parcel to each utility account. Because of the complexity of the Borough Assessor’s and the Borough's utility data management system, it will not be possible to match each parcel address and utility service address using the computer. The computer sorting, generated in Task I, will be used to complete this task.

Field verification (Task IV) should be done only when methods used in Task II and Task III do not yield the necessary information. This is to minimize the labor requirements of this labor intensive task. The Borough may consider using inspectors to accomplish this task.

The fifth task is the actual integration of the stormwater utility into the existing utility billing system maintained by Greentown Borough. Coordination of the integration of the two systems is anticipated to take a minimum of two months. There are three components to this task. The first component is the modification of the computer programs which generate the utility bills. The second component is the modification of accounting procedures to accommodate the stormwater bills. The final component is the modification related to the printing of new bills.

The sixth and final task is the establishment of policies, procedures, and contractual agreements necessary to administer the stormwater billing and management programs. Procedures, such as those described in Section 7.5, would also have to be established to maintain and update the stormwater utility records and track the flow of revenues. Along with those activities, the adjustment policy and procedures must be completed. It is anticipated that this function will require at least three meetings with impacted members of the community.

When all these items have been accomplished, the stormwater program would be fully operative. With the process proceeding in parallel with the budget development/review/ approval schedule for Fiscal Year 2005, all action should be complete for initial billing to begin in January 2006.