

# AN EVALUATION OF STORM WATER FEE AND RATE STRUCTURES IN JURISDICTIONS SURROUNDING WASHINGTON D.C.

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## ***Abstract***

The authors have conducted an evaluation of storm water fee and rate structures in cities, counties, and other municipal jurisdictions surrounding the District of Columbia in Virginia and Maryland, as well as selected others jurisdictions in the U.S. The jurisdictions studied typically depend on storm water fees to pay for permit-related storm water expenses not covered by other revenue sources. Both rural and urban jurisdictions were included in the study to provide the full range of rates and fee structures currently in use. Analysis of the rate systems includes rate structure methodology and the use of financial incentives for landowners to implement storm water controls on-site. The jurisdictions surveyed vary by land area, population, and land use.

The majority of jurisdictions surveyed assess a storm water fee based on some measure of impervious area. The method of determining impervious area varies from grouping properties into rate classes based on land area and/or zoning, to more complex GIS-based systems that assign a specific impervious area to each property. The benefits and difficulties associated with each of these approaches was evaluated.

As part of this survey, specific practices of interest to the District of Columbia were noted including:

- Whether the local jurisdictions charge storm water fees to federal properties.
- The use of financial incentives to promote retrofitting of storm water controls on existing residential and commercial properties.
- The creation of new storm water utility bill accounts for properties that previously did not receive storm water bill as part of a water and sewer bill.
- The use of liens or other legal mechanisms including surcharges for late payment if a storm water fee is not paid.
- Systems to allow property owners to request a review of the calculation of imperviousness.

- Reduced rates/exemptions provided to low-income seniors and low-income disabled customers.

The study also investigated the time and effort required to implement a new storm water fee; the type of studies required to prepare the fee structure; data input requirements for the imperviousness and the property types from existing or improved GIS systems; and the overall costs for the study and rate structure implementation.

The findings indicate that the majority of jurisdictions have developed, are developing, or are investigating developing an impervious area based fee structure for storm water fees. However, limitations in the resolution of imperviousness data, and the inherent difficulties in billing and verifying changes in imperviousness have primarily limited the application of the systems to grouping of ratepayers into classes by parcel size, land use, and/or water consumption.

The concept of basing stormwater fees on the impervious area of a property is relatively straightforward. However, implementation can be an involved undertaking requiring significant input to develop/manipulate the database components required to assign and track changes in the impervious area of each individual property. This is confirmed in the experiences of those who have been through the entire process in other jurisdictions. The challenges are generally: 1) developing the data to provide a defensible basis for computations; 2) assuring efficacy in revenue generation at levels that are fair and acceptable; and 3) assuring efficiency in billing and collections.

The majority of the cities, counties, and municipal jurisdictions surveyed that have instituted an impervious area based fee use the Equivalent Residential Units (ERU) methodology. Generally, this methodology establishes a fixed fee for single-family and multi-family residences based on an impervious area study of typical properties, and applies a true impervious area based fee to larger, commercial, industrial, and municipal properties.

In advanced applications, the ERU methodology provides for establishing beneficial incentives for property owners, encouraging onsite stormwater management. However, calculating the incentives, and tracking on-going implementation of onsite controls requires developing and maintaining advanced database systems. The majority of jurisdictions surveyed have not progressed to this level of implementation.

## ***Introduction***

As more and more cities, municipalities, and urban areas become participants in the NPDES stormwater permitting system, many jurisdictions are instituting some form of stormwater fee to off-set the costs of stormwater permit compliance activities. Initially, flat fee structures, as either an additional charge on water and sewer bills or a surcharge on property taxes have been the most common method of collecting these stormwater fees. As the cost of stormwater permit compliance increases, there is a trend among jurisdictions to examine the equitability of the flat fee structure, and explore ways to provide incentives through the fee structure for individual property owners to decrease stormwater runoff from their properties, and improve the water quality of runoff that does leave their property.

The authors conducted a preliminary evaluation of storm water fee and rate structures in cities, counties, and other municipal jurisdictions surrounding the District of Columbia in Virginia and Maryland, as well as selected other jurisdictions around the country. Jurisdictions typically depend on stormwater fees to pay for permit-related stormwater activities that are not funded by other existing revenue sources. Appendix A provides a summary of the jurisdictions surveyed, the rate and fee structure, and the average single-family, multi-family, commercial, and municipal fees per year. Both rural and urban jurisdictions are included in the table to provide the full range of rates and fee structures currently in use. Note that the table provides population density for each jurisdiction as a measure of the development density. The District of Columbia, being highly urban, has the highest population density of the jurisdictions listed.

## ***Basis of Methodology***

The majority of the cities, counties, and municipal jurisdictions surveyed use the Equivalent Residential Units (ERU) methodology. An ERU-based rate structure allocates an equal share of costs to all single-family residential customers based on the characteristics of a “typical” residential property. This method determines the average impervious area for zones/categories of customers, including single-family, multi-family, etc. The number of parcels and impervious areas for each zone/category is usually estimated using GIS mapping. The average impervious area for each zone/category is then calculated to determine the ERU unit.

For each ERU unit, it is determined that a certain amount of stormwater drains off the impervious surfaces in that area and into the stormwater drainage system. The number of ERUs attributable to each lot is determined based on the size and impervious surface area of the lot. Areas that are completely undeveloped (i.e., undisturbed) are usually considered as having zero ERUs, and thus are assessed no stormwater fee.

The ERU unit varies for the jurisdictions surveyed, but it is approximately equal to 2,000 square feet of impervious surface, on average, for the jurisdictions surrounding the District. The ERU unit rate is based upon projected costs to operate, maintain, and

improve stormwater systems, and locally ranges between \$20 and \$30 per ERU unit. Approximately half of the local jurisdictions investigated charge storm water fees to federal properties.

The jurisdictions surveyed vary by land area, population, and land use. The District of Columbia has a land area of approximately 61 square miles. The population is approximately 572,100 (approximately 9,400 persons per square mile). The Federal and local government own approximately 42% of the land, with the balance being real property ownership (approximately 58%). Jurisdictions with a similar land area as the District are Baltimore City, Maryland, and Norfolk and Newport News, Virginia.

### **Practices and Procedures**

During this survey, specific practices of interest in other jurisdictions were noted and include:

- In Broken Arrow, Oklahoma, new stormwater utility bill accounts were created for properties that previously did not receive a water and sewer bill.
- In Parker Colorado, a lien would be placed on the property for the outstanding fee amount, plus a surcharge for late payment if a stormwater fee is not paid. The delinquent amount would then be collected with property taxes. The appeal processes are made available in questions of impervious areas. A property owner may request a review of the calculation of imperviousness. When requested, a site visit may be conducted to verify which areas are impervious and if the impervious amount needs to be corrected, the owner would be re-billed or credited for the adjusted amount.
- In Hudson, New York, property owners who have individual drainage systems that allow them to manage storm drainage without contributing to the City's stormwater system are not billed since they are completely independent of the City.
- In Montgomery County, Maryland, in cases where non-residential property has its own stormwater management system that bypasses downstream residential development, the owner of the property is responsible for maintenance and subsequently not charged a fee.
- In Longview, Washington, exemptions are provided to low-income seniors and low-income disabled customers who meet the City's low-income qualifications.

### ***Developing an Impervious Area Rate System: Study Costs and Timelines***

Although the concept of basing stormwater fees on the impervious area of a property is straightforward, implementation can be an involved undertaking. This is confirmed in

the experiences of those who have been through the entire process in other jurisdictions. The challenges are generally: 1) developing the data to provide a defensible basis for computations; 2) assuring efficacy in revenue generation at levels that are fair and acceptable; and 3) assuring efficiency in billing and collections. The implementation challenges facing Washington DC include several additional dimensions that are unique to the Federal City.

Montgomery County, Maryland, began implementation of a storm water fee called the Water Quality Protection Charge, on July 1, 2002. In preparing the fee structure there were two study phases, which comprised thirteen tasks. The first study phase was to establish a charge rate. The County decided on the ERU method. It took three months to complete information input of the imperviousness and the property types for the County GIS map and to calculate the rate. This relatively short timeframe was due to the completeness of the existing County GIS data information, with approximately half of the information already available. The second phase of the Montgomery County study involved setting up the system and implementing the process. This was a challenging eighteen months that involved legislative and other political processes. The overall costs for this study were approximately \$1 million dollars, equally divided between the two phases.

Baltimore City, Maryland, is currently studying a stormwater fee and is utilizing the ERU method. It had completed the first study phase that has taken nine months to update information for Baltimore City GIS map and establish a unit rate. This phase of work cost approximately \$380,000. The city is currently confronting the challenge of the second implementation phase.

The Panel notes that the District has already established a storm water fee and collection system, and thus has completed many of the second phase tasks conducted or being conducted by Baltimore and Montgomery County.

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**APPENDIX A. STORMWATER FEE SURVEY**

JURISDICTION	LAND AREA	POPULATION DENSITY	UNIT RATE	BASE METHOD	UNIT	RATE ZONES (cost per unit or % of water/sewer fee)				FUNDING USE	REMARKS
						Equivalent (sf)	Single Family	Multi-Family	Commercial & Industrial		
	(sq.mi.)	(persons per sq. mi.)	per unit / year								
<b>DISTRICT OF COLUMBIA</b>	61	9,378	N/A	Flat fee/per CCF (100 cubic feet)	N/A	\$7.00	1.40%	2.00%	2.00%	Administrative	--
<b>VIRGINIA</b>											
Arlington	26	7,290	\$26.04	ERU	2,762	\$26.04	\$24.74 per unit	\$67.70	None	the needs for FY99	Currently not implement. The rate study was a graduate project.
Chesapeake	341	584	\$21.00	ERU	2,112	\$21.00	\$21.00 per unit	*	Yes *	all permit requirements	--

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						Equivalent (sf)	Single Family	Multi-Family	Commercial & Industrial		
Hampton	52	2,816	\$30.00	ERU	2,429	\$30.00	\$30.00 per unit	*	No (Note 2)	maintenance and special projects	--
Newport News	68	2,649	\$27.60	ERU	1,777	\$27.60	\$11.59 per unit	*	Yes *, except VDOT	Storm Water Management programs	Structures of 2-2 stories are considered Multi-Family, and higher structures are treated as a commercial.
Norfolk	54	4,341	\$59.86	no ERU *	N/A	\$59.86	\$59.86 per unit	\$0.023 per impervious sf.	No (Note 1)	all permit requirements	Apartments and condo are billed as non-residential.
Prince William Co.	338	830	\$18.00	ERU	2,059	\$18.00	\$13.50 per unit	*	Yes *, except Federal	--	Multi-family is included apartments and townhouses/condos.

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						Equivalent (sf)	Single Family	Multi-Family	Commercial & Industrial		
<b>MARYLAND</b>											
Baltimore City	81	8,039	--	ERU	--	--	--	--	--	--	Currently establishing this fee; however, 50% chance of implementation.
Charles Co.	461	262	\$2.00 (Note 2)	N/A	N/A	Note 2	Note 2	Note 2	Note 3	5-year term projects; it does not cover the administrative.	Combination of Environmental Service and New Residential Lot Fees
Takoma Park	2	8,650	\$28.68	ERU	1,228	\$28.68	*	*	Yes *, except the local	projects and administrative	Established in 1997
Montgomery Co.	461	1,761	\$12.75	ERU	2,406	\$12.75 (\$4.25 for	*	*	* (Note 4)	Storm water maintenance including HOA and some	Water Quality Protection Charge (tax); effective July 1, 2002. (Note 5)

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						Equivalent (sf)	Single Family	Multi-Family	Commercial & Industrial		
	(sq.mi.)	(persons per sq. mi.)	per unit / year			TH)					administration costs; no new projects.
<b>OTHERS</b>											
Broken Arrow, Oklahoma	75	998	\$12.00	ESU	2,650	\$12.00	**	**	--	Stormwater monitoring	Effective on May 1, 2002. New account will be created for properties that currently do not receive a utility bill.
Cincinnati, Ohio	75	4,302	\$2.21	ERU	--	\$26.52 - \$37.1	--	*	--	Rehability over 100 years old	Established in 1985

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						Equivalent (sf)	Single Family	Multi-Family	Commercial & Industrial		
	(sq.mi.)	(persons per sq. mi.)	per unit / year								
						3				infrastructure	
Hudson, Ohio	25	891	\$36.00	ERU	--	\$36.00	1	--	--	Flood prevention, and repairing stream banks and infrastructure.	New utility accounts established for those owners who do not currently receive the bills.
Pensacola, Florida	89	4,629	\$48.00	ESU	2,575	**	**	**	--	Operations and maintenance of stormwater facilities	Stormwater Utility Fee
Parker, Colorado	14	2,028	--	average impervious area	--	\$60.00	\$60.00 per unit	per impervious area	per impervious area	Construction of drainage improvements, maintenance, monitoring, and planning.	Stormwater Utility Fee established in 1999. If a fee not paid, a lien will be placed on the property for the amount plus a surcharge.

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						Equivalent (sf)	Single Family	Multi-Family	Commercial & Industrial		
Portland, Oregon	130	4,125	--	--	N/A	\$131.64	\$131.64 per unit	\$60 / 1,000 sf	\$60 / 1,000 sf	Construction of sewer system facilities to reduce combined sewer overflows	Established in July 1999.
Longview, Washington	12	2,888	\$12.00	ERDU	2,500	\$12.00	\$12.00 per unit	***	***	Support comprehensive Storm Water Management Plan, maintenance, and public education.	Exemptions will include low-income seniors and disable customers. Appeal process is available in questions of impervious area.
Tacoma, Washington	49	3,950	\$111.48	ERDU	6,000	\$111.48	\$111.48 per unit	***	***	--	--

-- unknown information or data

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- \* ERU - Equivalent Resident Unit is based on the average impervious area (1 ERU = X sf). Townhouses and condos are considered as Multi-Family. Apartment is considered with Commercial & Industrial.
- \*\* ESU - Equivalent Service Unit or Equivalent Stormwater Unit. This is also based on imperviousness. ( 1 ESU = X sf)
- \*\*\* ERDU - (Equivalent Resident Dwelling Unit?) is based on the average area of one dwelling unit. Others properties would be based on impervious area per ERDU area unit.

### NOTES:

1. Local and VDOT properties are not charged, but Federal properties are charged.
2. (1)Environmental Service Fee - \$2 per improved lot, or (2) New Residential Lot - \$84 per recordation
3. Indian Head Naval Base is responsible for its own NPDES Permit for the first time in 2002.
4. Federal properties are exempted, but non-profits properties are charged. Some other non-residential properties are exempted if their SWM facilities' outfalls by-pass downstream residents and they responsible their own maintenance.
5. Cities of Takoma Park, Chevy Chase, Rockville, and Gaithersburg are exempt since they have their own SWM programs, except for Chevy Chase. Chevy Chase does not have SWM facilities except for storm drain systems.