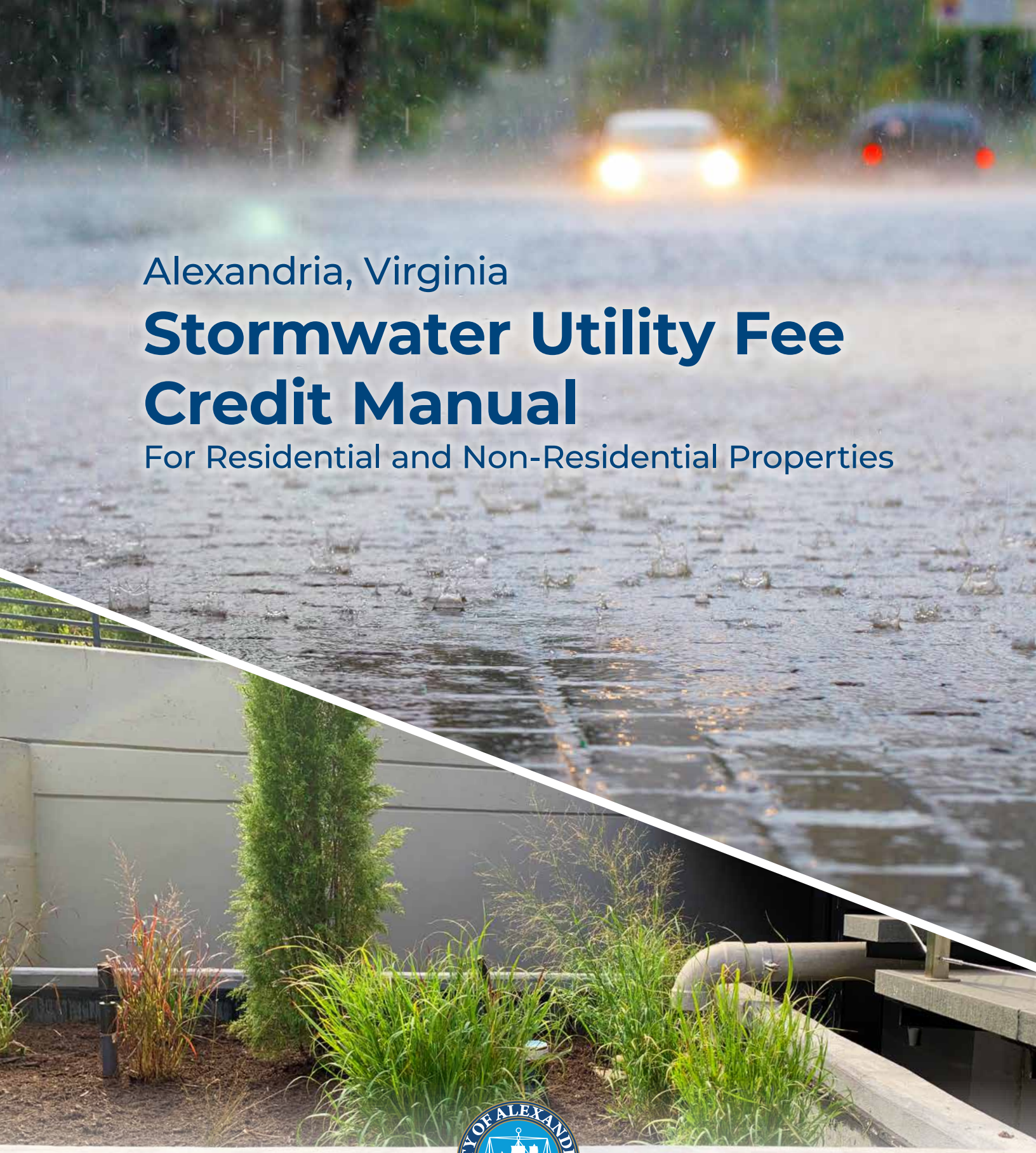

Alexandria, Virginia

Stormwater Utility Fee Credit Manual

For Residential and Non-Residential Properties

December 2018

Revised October 2022

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1. Purpose of the Manual

The City of Alexandria (City) adopted the Stormwater Utility (SWU) effective January 2018 to provide a dedicated funding source for existing stormwater management services and costly new capital stormwater infrastructure projects to reduce sediment and nutrient (nitrogen and phosphorous) pollution in urban stormwater runoff that enters our local waterways, the Potomac River, and the Chesapeake Bay; as mandated through the City's Municipal Separate Storm Sewer System (MS4) permit issued in 2013 by the Virginia Department of Environmental Quality (DEQ) under the Federal Clean Water Act. Since the first billing in May 2018, the City has made great progress towards these stormwater quality goals. However, urban flash flooding events from intense rainfall events caused by climate change that have occurred in the past few years has required the City to dedicate more resources to accelerate and increase operating programs and capital projects to make the City more resilient towards the impacts of urban flooding. In response, the City has increased the SWU fee for all rate payers. To help offset these increases, provide additional tools for property owners to protect their property, and to simplify the process, the Credit Manual and attendant policies have been updated.

This Credit Manual provides information on eligible practices that property owners can implement to protect stormwater quality and reduce flooding impacts, and instructions on how to apply for "credits" to reduce their SWU fee. These policies are consistent with state code and the City's Stormwater Utility Ordinance Section 5-6-235.

2. Credit Manual Updates

In response to lessons learned and community feedback since the implementation of the SWU Credit Program effective for the May 2018 SWU fee billing and adoption of the Credit Manual and attendant policies, the City has responded with updates to the Credit Manual to streamline the program. This includes policy changes to increase participation in the program and make the overall program easier to understand, while expanding the list of eligible practices to include dry floodproofing practices. To this end, the credit program and manual have been updated, to include, a simplified application process, to increase the existing practices credits, to increase the total credits per individual property, to allow for multi-year credits, to create an email notification to prompt reapplication at the end of the two-year period, to include mature tree preservation as an eligible practice, and to add dry floodproofing practices to the list of eligible practices.

2.1 SIMPLIFIED APPLICATION PROCESS

The City's online Credit application allows for easy access for computer users and provides a hard copy application option. The documentation in the application process has proven to be overly burdensome. Areas of duplication and low value-added documentation has been removed from the applications to simplify the process, while retaining the level of documentation necessary to ensure that eligibility requirements are met to grant credits. To accomplish this, the 'maintenance' and 'self-certification' requirements have been condensed into a "Terms and Conditions" checkbox. The documentation requirements have also been streamlined to remove duplication of requested items and require sufficient materials to review an application for credit. For instance, a photograph of a rain barrel showing that it has been implemented on the property and that the discharge is adequately located to not cause an issue on a neighboring property is enough for an application approval. A sketch of the rain barrel showing the same is not needed and adds little additional information for consideration during application review. To learn more about the updated application process, please see Section 9: Application Requirements.

2.2 MULTI-YEAR AND INCREASED CREDITS WITH NOTIFICATION TO REAPPLY

The proper functioning of stormwater management practices is the responsibility of the property owner. While some practices require more frequent inspection and maintenance, most practices eligible for credit remain functional without annual inspections and maintenance. Therefore, the annual application process has been amended to allow for a two-year credit applied to two consecutive calendar years or four billing cycles for approved applications. Additionally, credits for eligible practices have been increased and the overall potential maximum credit per application has been increased from 30% to 50% for a property implementing multiple practices. Providing two-year credits removes the annual application burden. Increasing the potential credits per eligible practice and overall potential credits per property provides added incentives for properties to implement practices to manage

stormwater onsite and reduce the amount of the annual SWU fee. Finally, previous applicants will be notified via email to reapply for the next two-year credit cycle.

2.3 MATURE TREE PRESERVATION

Established native mature trees can have a positive impact on urban stormwater runoff from impervious areas by reducing the volume of stormwater runoff and pollutants transported in stormwater runoff that reach local waterways. The previous policy recognized the positive impact of planting new trees and provided an associated credit for this practice. The updated policy adds potential credits for preserving and maintaining existing mature trees. New trees provide a positive impact on stormwater quality and quantity from a baseline condition. The preservation and maintenance of existing mature trees – even those that may have been established prior to the inception of the SWU fee – provides a prolonged positive impact on stormwater quality and quantity by reducing the amount of stormwater runoff and pollutants and preserving these trees will continue that positive impact into the future. For this reason, preservation of existing mature trees has been added to the list of eligible practices.

2.4 ADDITION OF DRY FLOODPROOFING PRACTICES

Recent flash flooding caused by climate change-induced intense storm events has impacted many property owners, with these intense storms also occurring more frequently. The Credit Program update introduces the addition of approved floodproofing practices to offer property owners potential, additional incentives to undertake flood mitigation efforts on private properties, while also reducing the impact of more frequent flooding on City services and infrastructure. Adding this SWU fee credit to the City's flood mitigation toolbox provides property owners with long-term return on private investments for flood mitigation efforts. When implemented, these mitigation efforts can yield significant benefit to the City, including reduced need for City services, retention of tax base, and reduced private property and public infrastructure damage from future flooding events; thus, enhancing the City's flood resilience. Justification for the addition of dry floodproofing to the SWU fee credit program is documented in Appendix A.

3. Background

3.1 WHAT IS STORMWATER?

Stormwater is the runoff from rainwater or snow melt that does not soak into the ground. This water flows over land through open channels and storm sewer pipes into one of our local waterways, such as Holmes Run, Cameron Run, Four Mile Run, Taylor Run, or Timber Branch. This stormwater runoff ultimately flows to the Potomac River and eventually the Chesapeake Bay.

Stormwater soaks easily into the ground in undeveloped areas such as those with grasses, abundant native plants, and trees. However, in developed urban areas with extensive impervious surfaces such as parking lots, sidewalks, roads and buildings, stormwater may not soak into the ground. Therefore, urban areas have more stormwater runoff, which can cause flooding and other storm drainage-related issues.

Urban stormwater often becomes polluted as it runs over the land surface and mixes with potential pollution sources, such as spilled motor oil, pet waste, fertilizer, pesticides, paint, grease, sediment, litter, and other substances that can be found on the ground. Runoff from impervious areas is the principal factor affecting the quality and quantity of stormwater in urban areas.

3.2 STORMWATER MANAGEMENT PROGRAM

The City's Stormwater Management Program includes three main program areas: Stormwater Quality, Flooding & Drainage, and Public Infrastructure Operation & Maintenance. These include operating programs and capital infrastructure projects.

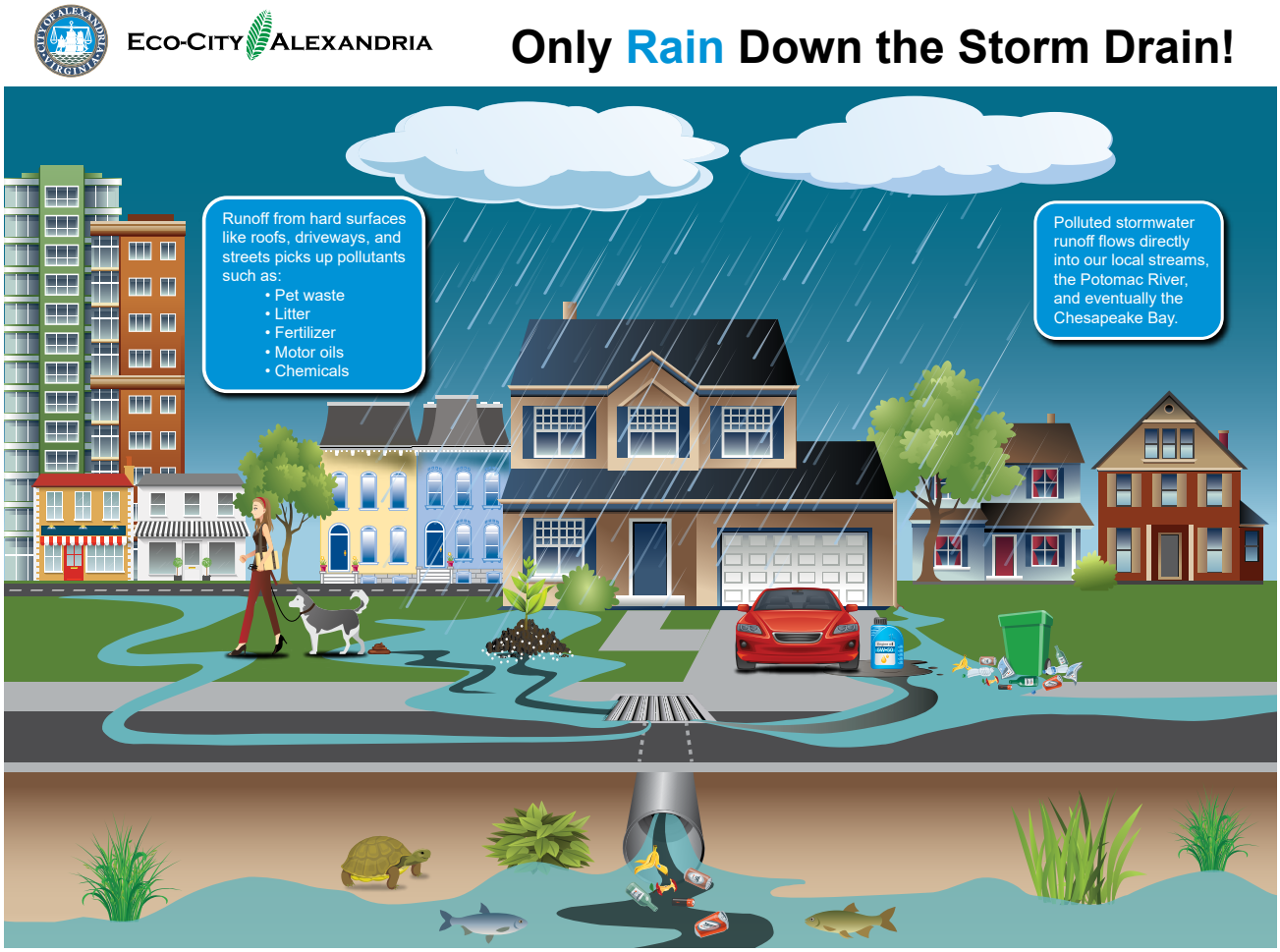
3.2.1 STORMWATER QUALITY

City services that aim to protect and improve stormwater quality include activities related to planning, engineering, and construction; regulations and enforcement; public education and involvement; and O&M of stormwater quality best management practices (BMPs).

Stormwater quality BMPs help to prevent pollution from entering waterways. BMPs include green roofs, permeable pavement, bioretention planters, trees, wetlands and living shorelines. BMPs that you can't always see also include routine inspections and maintenance, limits on fertilizer application, volunteer groups adopting blocks to keep the streets free of debris, and much more.

BMPs are installed two different ways. The first is public development under the Capital Improvement Program (CIP). The second way is by private developers to meet the City's stormwater development standards. Stormwater throughout the City is managed by a growing inventory of over 180 publicly owned and over 630 privately owned stormwater quality BMPs. The inventory of BMPs will continue to grow steadily as new development, redevelopment and CIP projects are completed over time.

Privately owned BMPs must be inspected and maintained by the property owner at least once a year depending on the type of practice per a maintenance agreement between the property owner and the



City. Periodic inspections are performed by the City at least once every five years in accordance with state and federal regulations to ensure the stormwater infrastructure is functioning properly.

3.2.2 FLOODING AND DRAINAGE

The City's low elevation, proximity to several local waterways and the Potomac River, and the increased frequency of more severe rainfall events make it susceptible to flooding. Alexandria has endured five storm events in the past few years (July 8, 2019, July 23, 2020, September 10, 2020, August 15, 2021, September 16, 2021, and August 10, 2022) where the intensity and duration of the rainfall has far-exceeded the design capacity of older storm sewers in historic neighborhoods developed prior to the current regulations, resulting in devastating flooding. The first three storms prompted the City Manager to establish an interdepartmental task force focused on increasing the City's resilience to flooding. This task force and City Council approval launched the Flood Action Alexandria initiative in 2021. This effort included a shift of resources and increase to the SWU rate to enhance the storm sewer infrastructure inspection and maintenance to ensure a state of good repair and accelerate the identification and delivery of spot improvement and large capacity capital projects to mitigate the impacts of flash flooding events caused by intense climate change-induced storms. The Flood Grant Program was also established which provides a 50% matching grant up to $5,000 as an incentive to property owners that

implement eligible floodproofing practices as a first line of defense in protecting people and property; while the City inspects, maintains, and enhances the storage and conveyance capacity of the storm sewer system to increase resiliency to flooding impacts.

In addition to flash flooding from intense storms that overwhelm the storm sewer system, flooding also occurs along City streams when rainfall in the larger watershed exceeds the conveyance capacity of the stream. Performing channel maintenance through dredging or debris removal reestablishes the capacity for channels to adequately convey flows.

Residents can use Alex311 online, via the app, or by calling to submit water quality and flood-related service requests. Staff investigates the requests to determine steps to address the stated issues, which may include planning, design, and construction of a capital project to fix drainage problems.

3.2.3 PUBLIC INFRASTRUCTURE OPERATION AND MAINTENANCE

The City's operation and maintenance (O&M) program ensures adequate condition and function of the MS4, that has over 210 miles of storm sewer pipes and over 14,000 storm sewer structures. Additionally, over 560 lane miles of roads, over 180 publicly owned stormwater quality BMPs, and about 25 miles of streams are part of the O&M program.

O&M activities include street sweeping, collection of leaves, investigation and cleaning of storm sewer pipes and structures, repair of damaged pipes and structures, routine inspection and maintenance of publicly owned BMPs, and dredging of flood channels. Maintenance reduces pollutants entering our waterways and minimizes the occurrence of drainage issues and property damage. Operating and capital costs associated with mandated infrastructure are incorporated into the overall Stormwater Management Program and will increase as new infrastructure is built, operated, and maintained.

3.2.4 REGULATIONS AND MANDATES

The City's MS4 permit regulates discharges of stormwater from the City's infrastructure and is administered by DEQ. The MS4 permit mandates compliance activities for the Stormwater Management Program and requires annual compliance reporting on those activities.

The City must also comply with water quality-based regulations and mandates for its stormwater runoff per the MS4 permit, the Virginia Stormwater Management Program (VSMP) Regulations, and the Environmental Management Ordinance. Specific numeric stormwater quality mandates related to the December 2010 establishment of the Chesapeake Bay Total Maximum Daily Load (TMDL) targets for reducing nitrogen, phosphorous, and sediment in waterways were first incorporated into the 2013 MS4 permit. The mandates were established by the U.S. Environmental Protection Agency under the Clean Water Act to restore the Bay, as well as local streams and the Potomac River.

To meet the Chesapeake Bay stormwater mandates, new stormwater quality BMPs, modifications or 'retrofits' to existing ponds, implementation of green infrastructure, and other practices are needed to reduce pollutant loadings. Operating and capital costs associated with mandated infrastructure are incorporated into the overall Stormwater Management Program and will increase as new infrastructure is built, operated, and maintained.

4. City of Alexandria Stormwater Utility

On May 4, 2017, the City adopted the SWU ordinance, with an effective date January 1, 2018, to fund the City's management of stormwater runoff effectively and equitably. The SWU creates a dedicated source of funding based on a property's impervious area to meet long-term stormwater management needs without competing for General Fund support.

4.1 WHAT IS A STORMWATER UTILITY FEE?

A SWU fee is a fee for service just like those for services charged by other public utilities.

- Funds the Stormwater Management Program (described in Section 3)
- It is not the service fee for drinking water from Virginia American Water
- It is not the service fee for treatment of sewage from your kitchen sinks and bathroom fixtures from AlexRenew Enterprises
- It also does not fund AlexRenew's River Renew project that is designed to address combined sewer upgrades to prevent millions of gallons of sewage mixed with rainwater from contaminating our waterways

Funding from SWU fees can only be used for stormwater management per the Virginia Code § 15.2-2114. *Regulation of stormwater* as incorporated in the City Code Section 5-6-230, et.seq., with the rate of the fee being based on the cost of providing stormwater management services for the City's Stormwater Management Program.

4.2 HOW IS THE STORMWATER UTILITY FEE BILLED?

The SWU fee is billed twice a year as a line item on the Real Estate tax bills issued in May and October annually. The first-half payment is due in June and the second-half payment is due in November. If there is an error on your bill, you can appeal within 30 days after the May billing.

4.3 HOW IS YOUR SWU FEE CALCULATED?

The SWU fee is based on a property's impervious surface which is directly correlated to stormwater runoff. Therefore, the SWU fee distributes the cost of the City's stormwater management services equitably across developed properties. The impervious area used for this is different than the floor area inside a house. We measure the outside impervious area, like what a bird would see from above.

The amount of fee charged depends on a property's type and its impervious area. There are two fee structures – one for residential properties and one for non-residential properties.

The billing unit is an Equivalent Residential Unit (ERU). One ERU is defined as 2,062 sq. ft. of impervious area, which is typical for a detached single-family home. The fee is calculated as the product of the billing units and the fee rate, which is reviewed annually and set by the City Council to be effective July 1 each year. Visit the City's Stormwater Utility Fee website to find the most current rate.

4.3.1 RESIDENTIAL PROPERTIES

Residential properties include condominiums, townhouses, and single-family homes. The fee structure is tiered, based on the type of residential property (see Figure 1). For example, using the Fiscal Year (FY) 2023 SWU fee rate of $294, a condominium would pay $82.32 (0.28 ERU × $294), and a typical single-family home would pay $294 (1.0 ERU × $294).

4.3.2 NON-RESIDENTIAL PROPERTIES

Non-residential properties include commercial, industrial, institutional, apartments, non-profit, faith-based, and all other properties not included in the residential properties category. The fee structure is calculated based on the property's total impervious area. The total impervious area is then divided by the billing unit of 2,062 sq. ft. of impervious cover or 1 ERU. Figure 2 shows an example calculation for a non-residential property.

> Impervious cover includes hard surfaces that do not easily absorb water, such as rooftops, driveways, streets, parking areas and any concrete, asphalt or compacted gravel surfaces.

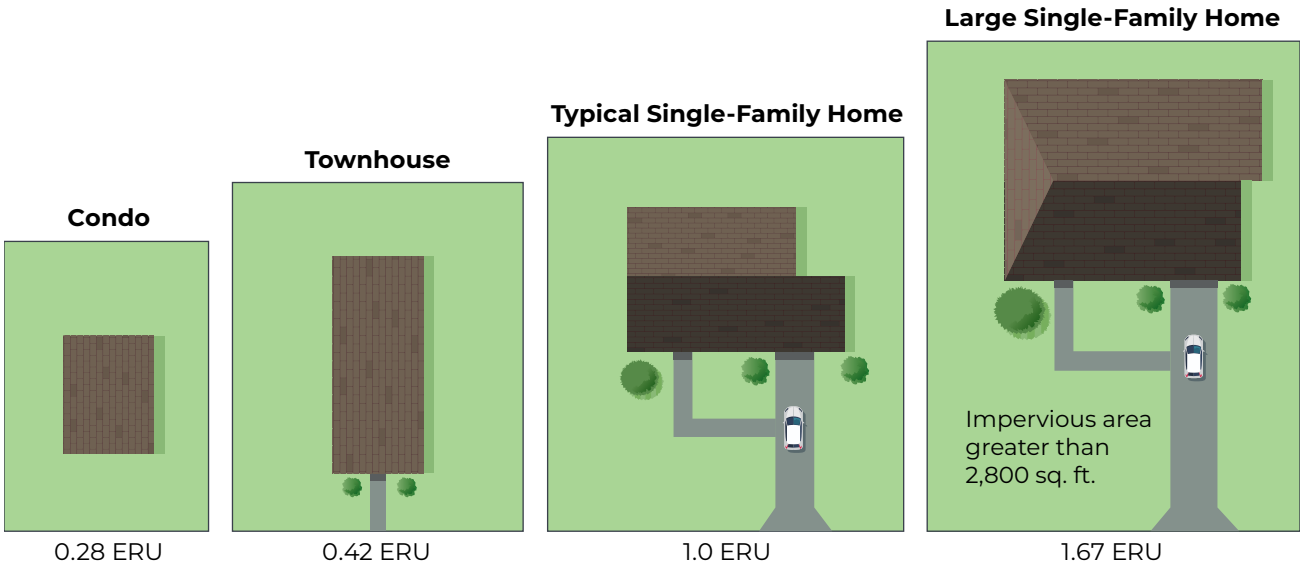


FIGURE 1. TIERED FEES FOR RESIDENTIAL PROPERTIES

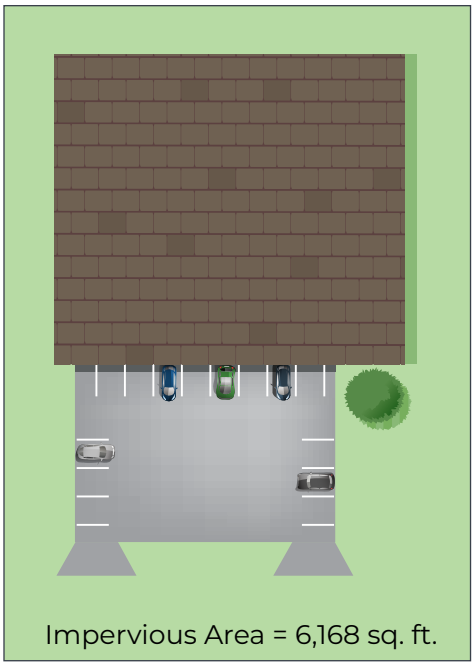


FIGURE 2. NON-RESIDENTIAL CALCULATION EXAMPLE

Building and parking lot impervious area	6,168 sq. ft.
1 ERU	2,062 sq. ft.
Total ERUs	6,168 / 2,062 = 3 ERU
Multiply by rate	3 ERU × $294 / ERU
Total annual fee	$882

5. What Stormwater Utility Fee Credits am I Eligible for?

The list of eligible SWU Fee Credits is related to the type of property. Due to variations in property types within the City, and to accommodate a broad credit menu from which to choose, not all allowable credits are applicable to every property. Property owners should refer to the Real Estate Assessment Search to access their property information. This Credit Manual is organized by applicant type and the credit menus available are also listed in Table 1, below.

TABLE 1. CREDIT MENU GUIDE BY APPLICANT TYPE

	CREDIT MENU		
APPLICANT TYPE	RESIDENTIAL PROPERTIES (SEE SECTION 6)	RESIDENTIAL CONDOMINIUM ASSOCIATION (SEE SECTION 7)	NON-RESIDENTIAL (SEE SECTION 8)
Typical Single-Family Home	✓		
Large Single-Family Home	✓		
Townhouse	✓		
Condominium	✓		
Condominium Association		✓	
Non-Residential			✓

Typical Single-Family Home, Large Single-Family Home, Condominium and Townhouse Rate designations share the same SWU Fee Credit Menu, linked in Section 6.

The Residential Condominium Association designation has a credit menu with credit opportunities applicable to residential condominium associations, linked in Section 7.

Finally, for non-residential properties designated as Calculated, the City offers a Non-Residential Properties Credit Menu, linked in Section 8.

6. Residential Properties Credit Menu

Single-family detached homes, townhouses, and condominiums are eligible for credits by installing and maintaining stormwater management practices, planting and maintaining eligible landscaping, and installing and maintaining dry floodproofing practices. Existing stormwater management practices may also be eligible for credits. Condominium and townhouse owners can receive credits for practices they install on their individual property. For practices that benefit multiple properties, the condominium association must apply on behalf of the residents. Please see the Residential Condominium Association Credit Menu (Section 7) for more information.

Credits may be combined for a **maximum 50% fee reduction**. Property owners are required to **reapply for credits every two (2) years** to continue receiving a fee reduction.

> Maximum 50% SWU fee reduction
> Reapply every two (2) years

All credits presented in Table 2 are flat rate credits, which means the percent credit will be applied to your annual fee for a period of two (2) years and does not depend on the size of your property. Example credit calculations are presented in Section 6.4. Practices from this list can be combined for a total credit up to 50% off. While there are typically multiple benefits with these practices, the description and discussion focus on benefits to stormwater quality and/or quantity.

TABLE 2: RESIDENTIAL PROPERTIES CREDIT MENU

PRACTICE		CREDIT
Stormwater Management Practices	Rain Barrels	5% each (max. 20% for 4)
	Cistern	20%
	Detention Practices	20%
	Dry Well / Infiltration	20%
	Rain Garden	20%
	Flow Thru Planter Box	20%
	Permeable Pavement	20%
	Vegetated Green Roof	20%
	Additional Stormwater Quality Practices[a]	20%
Eligible Landscaping Practices[b]	No Fertilizer Pledge	10%
	Conservation Landscaping	10%
	New Tree Planting	Up to 30% (one-time credit)
	Mature Tree Preservation	Up to 20%
Dry Floodproofing Practices	Protective Barriers/Walls	10%
	Permanent Doorway Flood Gate or Panel	10%
	Passive Flood Gates	10%
	Floodproof Windows	10%
	Basement Window Protection	10%
	Ground Floor/Basement Custom Window Wells	10%
	French Drain Around Basement	10%
	Impermeable (Water Resistant) Material Around Foundation	10%
	Concrete Sealer	5%
	Construct with Flood Resistant Building Materials	5%
	Elevate Exterior Utilities and Service Equipment	5%

a. Approved stormwater practices in the BMP Clearinghouse may be eligible for credits on a case-by-case bases. See 2011 design specifications for approved practices at https://swbmp.vwrrc.vt.edu/

b. Individual condominium owners are not eligible for these credits

6.1 STORMWATER MANAGEMENT PRACTICES

Descriptions of the eligible stormwater management practices are presented below.

6.1.1 RAIN BARRELS (5-20%)

Rain barrels are installed at downspouts and capture roof runoff which can then slowly empty into the surrounding landscape or be reused for watering outdoor plants and lawns.

Rain Barrel

6.1.2 CISTERN (20%)

Cisterns are like rain barrels but are much larger and can store hundreds of gallons of water. They are often installed underground. Stored water can be used for irrigation and select indoor uses, with approval.

6.1.3 DETENTION PRACTICES (20%)

Stormwater detention facilities are often installed during construction as a condition of development to reduce localized flooding. Typically, a detention facility is a large underground storage pipe or tank that temporarily holds runoff during rain events and then discharges it slowly to the storm sewer system.

6.1.4 DRY WELL/INFILTRATION (20%)

A dry well / infiltration practice is created by excavating a shallow trench that is filled with stone and used to temporarily store runoff, so it can soak into the ground.

6.1.5 RAIN GARDEN (20%)

Rain gardens use vegetation and soil media to let stormwater to collect and infiltrate into the ground. Natural underlying soils are replaced with a soil mix to increase infiltration and a mix of native plants filter out pollutants.

6.1.6 FLOW THRU PLANTER BOX (20%)

Flow Thru Planter Boxes are like rain gardens except they are adapted to fit into “containers” within urban landscapes. The planter box is typically contained in a precast or cast-in-place concrete vault and has an underdrain.

Flow Thru Planter Box

SOURCE: CITY OF ALEXANDRIA

6.1.7 PERMEABLE PAVEMENT (20%)

Permeable pavement is a hard surface that has enough gaps in it to allow rain to run through it. When rain runs through permeable pavement, it collects in a base layer of gravel, then gradually soaks into the ground. Typically, residential applications include interlocking paver blocks that can be used for driveways or sidewalks walk-ups.

6.1.8 VEGETATED GREEN ROOF (20%)

A vegetated green roof is a layer of vegetation planted over a waterproofing system that is installed on top of a flat or slightly sloped roof which stores and filters rainfall using a layer of soil media and specialized vegetation. They must be designed and installed by a qualified designer and contractor.

6.1.9 ADDITIONAL STORMWATER QUALITY PRACTICES (20%)

There are additional stormwater quality BMPs that are eligible for credits, which can be found in the Virginia Stormwater BMP Clearinghouse. These include non-proprietary and proprietary practices such as hydrodynamic separators and filtering devices.

6.2 ELIGIBLE LANDSCAPING PRACTICES

Descriptions of the eligible landscaping practices are presented below.

6.2.1 NO FERTILIZER PLEDGE (10%)

Make and uphold a No Fertilizer Pledge for a 10% reduction of your total annual fee.

> *I pledge to maintain a dense cover of grass, gardens, or conservation landscaping without using any fertilizers.*

A "No Fertilizer Pledge" is made by the homeowner during the application process. Credit will be awarded the year of the pledge and anticipates that the homeowner maintains their

Permeable pavement
SOURCE: CITY OF ALEXANDRIA

Vegetated green roof
SOURCE: CITY OF ALEXANDRIA

Tree box filter
SOURCE: CITY OF ALEXANDRIA

pledge. The "No Fertilizer Pledge" is effective and renewable on a bi-annual basis.

6.2.2 CONSERVATION LANDSCAPING (10%)

Conservation Landscaping is the conversion of lawn and hard surfaces into mulched beds planted with native perennial plants, shrubs and/or small trees. This practice benefits stormwater quality and quantity by retaining rainfall and absorbing runoff from adjacent lawns or impervious surfaces. A minimum 50 sq. ft. is required to receive credit.

6.2.3 NEW TREE PLANTING (UP TO 30%)

Planting new trees helps to increase our existing tree canopy, which can slow runoff rates, reducing stress on the stormwater drainage infrastructure by reducing peak flow rates. Property owners can apply for **one-time credit** for the purchase, installation, and initial maintenance of new native trees planted on their property.

New tree planting

New Tree Planting is calculated using the following formula:

% Credit = **30% maximum one-time credit** × (**Number of trees planted** ÷ **Number of trees for maximum credit**)

Table 3 includes the number of native trees that must be planted by property type to receive this one-time credit.

TABLE 3. REQUIRED NUMBER OF NEW TREES BY PROPERTY TYPE FOR MAXIMUM CREDIT

PROPERTY TYPE	NUMBER OF TREES FOR MAXIMUM CREDIT
Townhouse	1 native tree
Typical Single-Family Home	2 native trees
Large Single-Family Home	3 native trees

Condominium associations should apply for a new tree planting credit on behalf of the condominium owners. For new trees planted on townhouse property and not condominium association property, the townhouse owner may apply for this credit.

Tree selection should be appropriate for the planting site. Standards for tree planting, including a list of suggested tree varieties, can in the most recent version of the City's Landscape Guidelines. New trees must be non-invasive and native to Virginia or the Chesapeake Bay region with a minimum 1" to 2" caliper. Tree caliper is a standardized measurement of the tree diameter. For 1" and 2" caliper trees, the diameter of the tree trunk is measured at 6" above the ground. Eligible trees are those planted within the property boundaries and not part of another stormwater BMP like bioretention or a rain garden.

Trees must not have been planted as part of a condition of development. The applicant property must not be under development or within the time frame of the maintenance bond at the time new trees are planted.

6.2.4 MATURE TREE PRESERVATION (UP TO 20%)

Preserving the existing tree canopy is critical to stormwater management because mature trees provide water quality and quantity benefits by intercepting part of the rainfall that would otherwise run off impervious surfaces and be transported to the stormwater drainage system and our local waterways. Mature trees that are eligible for this credit must be established, have a trunk that is at least 12 inches in diameter at breast height,[1] which is 4½ feet from the ground.

Mature tree preservation is calculated using the following formula:

% Credit = 20% maximum × (Number of trees planted ÷ Number of trees for maximum credit)

Table 4 includes the number of mature trees that must be preserved by property type to receive this credit.

TABLE 4. REQUIRED NUMBER OF MATURE TREES BY PROPERTY TYPE FOR MAXIMUM CREDIT

PROPERTY TYPE	NUMBER OF TREES FOR MAXIMUM CREDIT
Townhouse	1 native tree
Typical Single-Family Home	2 native trees
Large Single-Family Home	3 native trees

Condominium associations should apply for a mature tree preservation credit on behalf of the condominium owners. For mature trees preserved on townhouse property and not condominium association property, the townhouse owner may apply for this credit.

6.3 DRY FLOODPROOFING PRACTICES

Dry floodproofing includes practices that keep a building and associated equipment and utilities dry by not allowing floodwaters to enter a structure. Dry floodproofing practices protect your home or business from water damage from flood waters and these practices protect

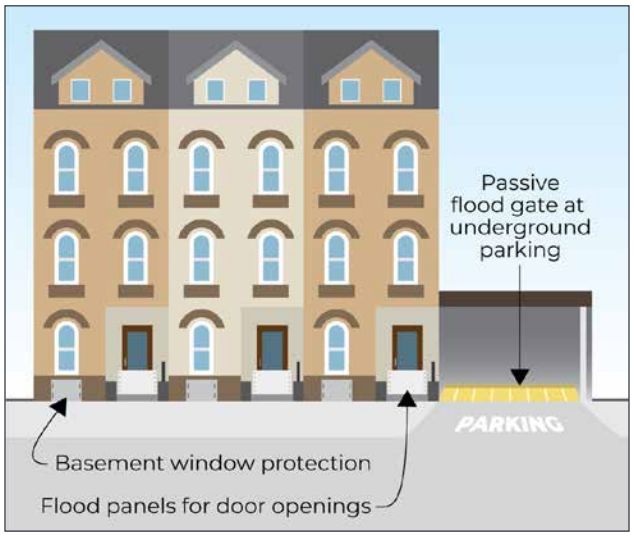


FIGURE 3. EXAMPLES OF DRY FLOODPROOFING FOR RESIDENTIAL PROPERTIES

1 Source: Recommendations of the Expert Panel to Define BMP Effectiveness for Urban Tree Canopy Expansion 7222-1.pdf (chesapeakestormwater.net)

water quality by preventing flood waters from contacting pollutants that are present in basements and other structures. Once flood waters recede, polluted water that has collected in basements, parking garages and other structures is typically pumped into the storm sewer system without treatment, which is discharged to surface water bodies. Descriptions of the eligible dry floodproofing practices are presented below.

6.3.1 PROTECTIVE BARRIERS/WALLS (10%)

This practice includes installing brick, cinder block or similar materials formed into a wall or similar barrier (i.e., stair or "step up") to help to prevent the intrusion of flood waters.

6.3.2 PERMANENT DOORWAY FLOOD GATE OR PANEL (10%)

Permanent doorway flood gates or panels are physical barriers that attach to external doorframe and are always deployed to prevent floodwaters from entering a structure. They are opened and closed as entry is required to the building.

Permanent doorway flood panel

6.3.3 PASSIVE FLOOD GATES (10%)

Passive flood gates will automatically deploy using hydrostatic pressure from rising floodwater during flooding events to protect the entry point. These do not require electricity nor an external person to activate the system.

6.3.4 FLOODPROOF WINDOWS (10%)

Permanent glass protection can prevent flood damage from flooding and other extreme weather events. Floodproof windows or those with glass protection are passive systems that protect from rising flood water and debris impact.

Passive flood gate at entrance to parking garage
SOURCE: CITY OF ALEXANDRIA

6.3.5 BASEMENT WINDOW PROTECTION (10%)

Basement window protection consists of fixed, translucent, water-tight covers that are installed on near grade or below grade basement windows.

6.3.6 GROUND FLOOR/BASEMENT CUSTOM WINDOW WELLS (10%)

Custom window wells include a central drain that is either connected to an interior or exterior drain tile system or to a line that runs to a stormwater drain or out to daylight. These practices are installed at near-grade and at-grade windows to prevent intrusion of flood waters.

6.3.7 FRENCH DRAIN AROUND BASEMENT (10%)

French drains collect and direct runoff and groundwater away from a home's foundation.

6.3.8 IMPERMEABLE (WATER RESISTANT) MATERIAL BARRIER AT FOUNDATION (10%)

This includes installing impermeable or water resistant materials around the foundation of your home to reduce intrusion of surface flood waters.

6.3.9 CONCRETE SEALER (5%)

Applying waterproofing compounds such as polyurethane and thick rubberized liquids to interior concrete surfaces will decrease their water absorbency and create an impermeable water barrier to protect basements and lower levels of buildings.

6.3.10 CONSTRUCT WITH FLOOD-RESISTANT BUILDING MATERIALS (5%)

Flood resistant building materials are able to withstand direct and prolonged contact with floodwaters without sustaining significant damage. The term "prolonged contact" means at least 72 hours, and the term "significant damage" means any damage requiring more than cosmetic repair.

6.3.11 ELEVATE EXTERIOR UTILITIES AND SERVICE EQUIPMENT (5%)

For external utilities such as heat pumps and Heating, Ventilation, and Air Conditioning (HVAC) elevate with cement blocks to an elevation outside of the floodplain.

6.4 CREDIT CALCULATION EXAMPLES FOR RESIDENTIAL PROPERTIES

All credits achieved by the residential property owner are flat rate, which means the percent credit will be applied to your total fee. Stormwater management practices, eligible landscaping, and dry floodproofing practices can be combined for a total credit up to 50% off.

French drain around basement
SOURCE: CITY OF ALEXANDRIA

Elevated exterior HVAC equipment
SOURCE: FEMA

6.4.1 STORMWATER MANAGEMENT EXAMPLE

Step 1: Calculate Percentage of Fee Reduction

A detached single-family property with less than 2,800 sq. ft. of impervious area has installed a rain garden and one rain barrel on their property. Both creditable practices help manage drainage on their property. The property owner inspects and maintains both practices yearly. The total credit is 25% for these two practices.

PRACTICE	CREDIT
Rain Garden	20%
Rain Barrel	5%
Total	25%

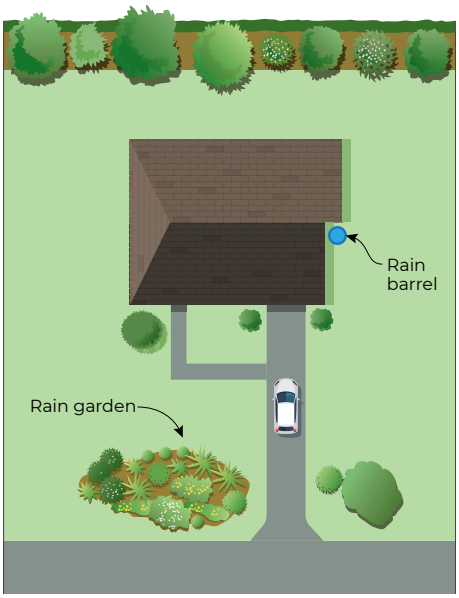


FIGURE 4. RESIDENTIAL PROPERTY EXAMPLE

Step 2: Calculate Amount of Credit

The homeowner receives an annual stormwater utility fee of $294,[2] which is good for two (2) years. Based on the percentage fee reduction from Step 1, the credit will be $73.50.

25% Percentage fee reduction × **$294 Stormwater fee** = **$73.50 Amount of credit**

6.4.2 NEW TREE PLANTING EXAMPLE

A typical single family home plans to plant 1 tree. From Table 3, the number of trees for maximum credit would be 2 new native trees. Plugging into the formula would provide a credit of 15%.

% Credit = **30% maximum one-time credit** × **(1 ÷ 2)** = **15% Credit**

6.4.3 MATURE TREE PRESERVATION EXAMPLE

A large single-family home has preserved two mature trees on their property. From Table 4, the number of trees for maximum credit would be 3 mature trees. Plugging into the formula would provide a credit of 13.3%.

% Credit = **20% maximum** × **(2 ÷ 3)** = **13.3% Credit**

2 Example uses the Fiscal Year 2023 rate

6.4.4 DRY FLOODPROOFING EXAMPLE

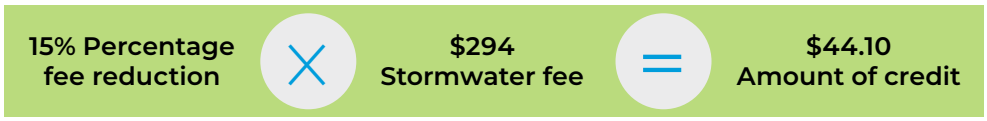
Step 1: Calculate Percentage of Fee Reduction

A detached single-family property with less than 2,800 sq. ft. of impervious area has elevated their heat pump on the exterior of their home and installed basement window protection. The total credit is 15% for these two practices.

PRACTICE	CREDIT
Elevate Utilities	5%
Basement Window Protection	10%
Total	15%

Step 2: Calculate Amount of Credit

The homeowner receives an annual stormwater utility fee of $294.[3] Based on the percentage fee reduction from Step 1, the credit will be $44.10.



6.4.5 MULTIPLE PRACTICES COMBINATION EXAMPLE

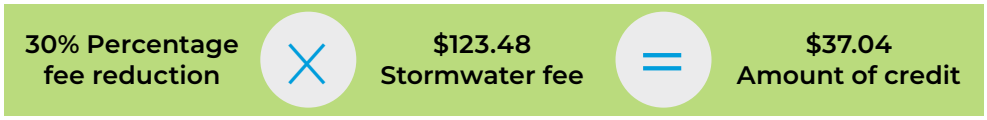
Step 1: Calculate Percentage of Fee Reduction

A townhouse installs floodproof windows on their home, has signed the "No Fertilizer Pledge" and installed two rain barrels on the downspouts in their front and backyard. The total credit is 30% for the combination of these stormwater management, landscaping and dry floodproofing practices.

PRACTICE	CREDIT
Floodproof Windows	10%
No Fertilizer Pledge	10%
Rain Barrels (2 @ 5% each)	10%
Total	30%

Step 2: Calculate Amount of Credit

The homeowner receives an annual stormwater utility fee of $123.48.[4] Based on the percentage fee reduction from Step 1, the credit will be $37.04.



3 Example uses the Fiscal Year 2023 rate

4 Example uses the Fiscal Year 2023 rate

7. Residential Condominium Associations Credit Menu

Residential condominium associations are organizations made up of condominiums and/or townhouses based on property governance type. Residential condominium associations are eligible for a variety of credits. The condominium association must apply on behalf of the condominium property owners and reapply every two (2) years for the condominium owners to continue receiving a credit. Eligible ways to receive a credit are to install and maintain a stormwater management practice, eligible landscaping and dry floodproofing practice(s). Credits can be combined for a maximum 50% reduction for each of the condominium owners within the affected building(s).

Credits may be combined for a **maximum 50% reduction**. Condominium associations are required to **reapply for credits every two (2) years** to continue receiving a fee reduction.

> Maximum 50% reduction
> Reapply every two (2) years

Stormwater management credits presented in Table 5 are based on the site's impervious area that drains to the practice. Dry Floodproofing practice credits in Table 5 are applied as flat credits for all property owners within the impacted building(s) where a practice is installed. Example credit calculations are presented in Section 7.4. Credits will be applied to the annual fee for all impacted condominium owners for a period of two (2) years, and practices from this list can be combined for a total credit up to 50%.

TABLE 5. RESIDENTIAL CONDOMINIUM ASSOCIATION CREDIT MENU

PRACTICE		MAXIMUM CREDIT
Stormwater Management Practices	Detention Practices	20%
	Infiltration Practices	20%
	Bioretention Facility	20%
	Dry Swale	20%
	Wet Swale	20%
	Grass Channel	20%
	Permeable Pavement	20%
	Rainwater Harvesting	20%
	Rooftop/Impervious Area Disconnection	20%
	Sheet flow to a Vegetated Filter Strip or Conserved Open Space	20%
	Vegetated Green Roof	20%
	Additional Stormwater Quality Practices[a]	20%
Eligible Landscaping Practices	Urban Nutrient Management Plan	Up to 10% (1% for each 1,000 sq. ft. in plan)
	New Tree Planting	Up to 30% (one-time credit)
	Mature Tree Preservation	Up to 20%
Dry Floodproofing Practices	Protective Barriers/Walls	10%
	Permanent Doorway Flood Gate or Panel	10%
	Passive Flood Gates	10%
	Floodproof Windows	10%
	Basement Window Protection	10%
	Ground Floor/Basement Custom Window Wells	10%
	French Drain Around Basement	10%
	Impermeable (Water Resistant) Material Around Foundation	10%
	Concrete Sealer	5%
	Construct with Flood Resistant Building Materials	5%
	Elevate Exterior Utilities and Service Equipment	5%

a. Approved stormwater practices in the BMP Clearinghouse may be eligible for credits on a case-by-case bases. See 2011 design specifications for approved practices at https://swbmp.vwrrc.vt.edu/

7.1 STORMWATER MANAGEMENT PRACTICES

Descriptions of the eligible stormwater management practices are presented below. Note that water should not be concentrated and directed onto neighboring properties.

7.1.1 DETENTION PRACTICES (UP TO 20%)

Stormwater detention facilities are often installed during construction as a condition of development to reduce localized flooding. Typically, a detention facility is a large underground storage pipe/vault or a pond that temporarily holds a designed portion of runoff during rain events and then discharges it slowly to the storm sewer system.

Dry detention basin
SOURCE: CITY OF ALEXANDRIA

7.1.2 INFILTRATION PRACTICES (UP TO 20%)

Infiltration practices use temporary surface or underground storage to allow stormwater runoff to infiltrate into the underlying soils. Infiltration practices involve installing a series of layers of rock and soil media below the soil surface. Infiltration practices have the greatest runoff reduction capability of any stormwater practice and are suitable for use in many residential and other urban areas where measured soil permeability rates exceed ½ inch per hour. Property owners installing an infiltration practice must conduct a soil permeability analysis prior to installation to ensure the proper rate can be met.

7.1.3 BIORETENTION FACILITY (UP TO 20%)

Bioretention practices use vegetation and soil media to aid in the infiltration and storage of rainfall and stormwater runoff. Natural underlying soils are replaced with a soil mix to increase infiltration and a mix of native plants are planted to help filter out pollutants.

Bioretention facility
SOURCE: CITY OF ALEXANDRIA

7.1.4 DRY SWALE (UP TO 20%)

Dry swales are like bioretention cells but are shallower and configured as linear channels covered with turf instead of mulch and vegetation. Rainfall and stormwater runoff enter the channel and are temporarily stored and then filter through the turf and underlying soil mix.

7.1.5 WET SWALE (UP TO 20%)

Wet swales are a cross between a wetland and a dry swale. Wet swales are made up of saturated soils and wetland vegetation that provide moderate pollutant reduction through gravitational settling, biological uptake of pollutants through the vegetation present, and microbial activity.

7.1.6 GRASS CHANNEL (UP TO 20%)

Grass channels provide stormwater runoff filtering and increased infiltration. Grass channels are linear practices and can be applied in a series of multiple channels in a row

7.1.7 PERMEABLE PAVEMENT (UP TO 20%)

Permeable pavement is a hard surface that has enough gaps in it to allow rain to drain through it. When rain drains through permeable pavement, it collects in a base layer of gravel, then gradually soaks into the ground. Interlocking paver blocks or permeable pavement can be used for driveways, parking lots, and other surfaces that would typically be paved with asphalt or concrete. The purpose of this credit is for permeable pavement to be used as a BMP with stormwater runoff being directed to the permeable pavement location.

7.1.8 RAINWATER HARVESTING (UP TO 20%)

Rainwater harvesting practices are used to capture roof runoff in a barrel or tank (cistern) which can then slowly empty into the surrounding landscape or be reused for outdoor irrigation/watering and/or for selected indoor uses.

7.1.9 ROOFTOP/IMPERVIOUS AREA DISCONNECTION (UP TO 20%)

There are two types of rooftop disconnection including (1) simple disconnection, where rooftop drains are directed towards pervious areas like turf, and (2) disconnection which leads to another green infrastructure practice for additional water

Wet swale
SOURCE: CHESAPEAKESTORMWATER.NET

Permeable pavement
SOURCE: CITY OF ALEXANDRIA

Cistern
SOURCE: CITY OF ALEXANDRIA

quality and quantity treatment. Property owners must use the second type of disconnection and include other practices to be eligible for credit, such as a dry well, rain garden, storage in a rain barrel, etc. These practices manage the stormwater runoff coming from rooftop drains by slowing the water to allow for greater infiltration, filtration, and in some cases reuse.

7.1.10 SHEET FLOW TO A VEGETATED FILTER STRIP OR CONSERVED OPEN SPACE (UP TO 20%)

This practice involves managing runoff from impervious areas and turf as sheet flow by spreading the flow out across an area instead of concentrating flow in a pipe or channel. This can be done by using gravel trenches or level spreaders to discharge flow to vegetated filter strips or areas of undisturbed land called conserved open space. Vegetated filter strips include areas with amended soils and dense turf cover or landscapes areas with trees, shrubs, and other herbaceous cover.

Vegetated green roof
SOURCE: CITY OF ALEXANDRIA

7.1.11 VEGETATED GREEN ROOF (UP TO 20%)

A vegetated green roof is a layer of vegetation planted over a waterproofing system that is installed on top of a flat or slightly sloped roof which stores and filters rainfall using a layer of soil media and specialized vegetation. Green roofs must be designed and installed by a qualified designer and contractor.

7.1.12 ADDITIONAL STORMWATER QUALITY PRACTICES (UP TO 20%)

Additional stormwater quality BMPs that are eligible for credits found at Virginia Stormwater BMP Clearinghouse. These include non-proprietary and proprietary practices such as hydrodynamic separators and filtering devices.

Tree box filter
SOURCE: CITY OF ALEXANDRIA

7.2 ELIGIBLE LANDSCAPING PRACTICES

Descriptions of the eligible landscaping practices are presented below.

7.2.1 URBAN NUTRIENT MANAGEMENT PLAN (UP TO 10%)

An urban nutrient management plan is a plan prepared by a Virginia certified nutrient management planner to manage the amount, placement, timing and application of fertilizer, compost, or other materials containing plant nutrients to reduce nutrient loss to the environment and to produce quality turf and landscape plants.

Residential condominium associations are eligible for a credit for voluntarily developed Nutrient Management Plans at a rate of 1% credit for every 1,000 sq. ft. of property covered by the plan, up to a maximum 10% credit. The minimum property coverage for credit is 1,000 sq. ft., and for coverage falling between 1,000 square foot intervals, coverage will be rounded down to the nearest 1,000 sq. ft. Condominium associations should apply for Urban Nutrient Management Plan credits on behalf of the condominium owners

Fertilizer application
SOURCE: CITY OF ALEXANDRIA

7.2.2 NEW TREE PLANTING (UP TO 30%)

Planting new trees helps to increase our existing tree canopy, which can slow runoff rates, reducing stress on the stormwater drainage infrastructure by reducing peak flow rates. Condominium associations can apply on behalf of condominium owners for a **one-time credit** for the purchase, installation, and initial maintenance of new trees planted on the condominium association property.

New Tree Planting is calculated using the following formula:

% Credit = **20% maximum one-time credit** × (**Number of trees planted** ÷ **Number of trees for maximum credit**)

Table 6 includes the number of trees that must be planted by property type to receive this one-time credit.

TABLE 6. REQUIRED NUMBER OF NEW TREES BY PROPERTY TYPE FOR MAXIMUM CREDIT

PROPERTY TYPE	NUMBER OF TREES FOR MAXIMUM CREDIT
Condominium Association	1 native tree per 2 units

Tree selection should be appropriate for the planting site. Standards for tree planting, including a list of suggested tree varieties, can in the most recent version of the City's Landscape Guidelines. New trees must be non-invasive and native to Virginia or the Chesapeake Bay region with a minimum 1" to 2" caliper. Tree caliper is a standardized measurement of the tree diameter. For 1" and 2" caliper trees, the diameter of the tree trunk is measured at 6" above the ground. Eligible trees are those planted within the property boundaries and not part of another stormwater BMP like bioretention or a rain garden. Trees must not have been planted as part of a mandatory condition of development. The applicant property must not be under development or within the time frame of the maintenance bond at the time new trees are planted.

7.2.3 MATURE TREE PRESERVATION (UP TO 20%)

Preserving the existing tree canopy is critical to stormwater management because mature trees intercept rainfall that would otherwise run off paved surfaces and be transported to the stormwater drainage system and our local waterways. Mature trees that are eligible for this credit must be established, have a trunk that is at least 12 inches in diameter at breast height,[5] which is 4 ½ feet from the ground.

Mature tree preservation is calculated using the following formula:

% Credit = **20% maximum credit** × (**Number of trees planted** ÷ **Number of trees for maximum credit**)

Table 7 includes the number of mature trees that must be preserved by property type to receive this one-time credit.

TABLE 7. REQUIRED NUMBER OF MATURE TREES BY PROPERTY TYPE FOR MAXIMUM CREDIT

PROPERTY TYPE	NUMBER OF TREES FOR MAXIMUM CREDIT
Condominium Association	1 mature tree per 10 units

Condominium associations should apply for a mature tree preservation credit on behalf of the condominium owners. For mature trees preserved on townhouse property and not condominium association property, the townhouse owner may apply for this credit.

7.3 DRY FLOODPROOFING PRACTICES

Dry floodproofing includes practices that keep a building and associated equipment and utilities dry by not allowing floodwaters to enter a structure. Dry floodproofing practices protect your home or business from water damage from flood waters and these practices protect water quality by preventing flood waters from contacting pollutants that are present in basements and other structures. Once flood waters recede, polluted water that has collected in basements, parking garages and other structures is typically pumped into the storm sewer system, which is discharged without treatment to surface water bodies. Descriptions of the eligible dry floodproofing practices are presented below.

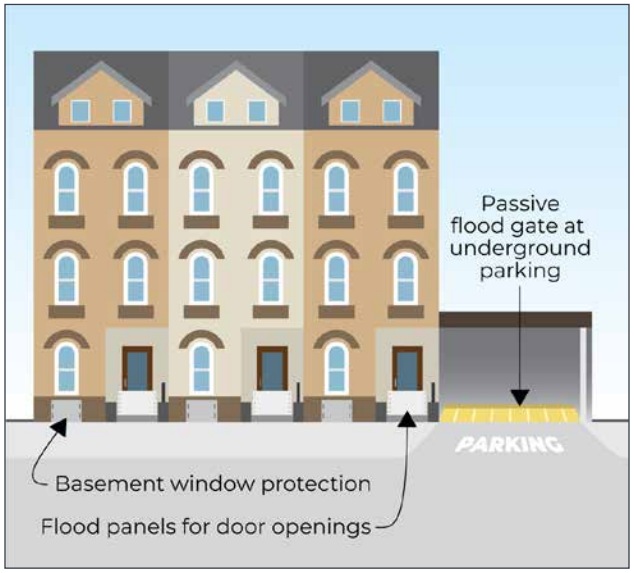


FIGURE 5. EXAMPLES OF DRY FLOODPROOFING FOR CONDO ASSOCIATIONS

5 Source: Recommendations of the Expert Panel to Define BMP Effectiveness for Urban Tree Canopy Expansion 7222-1.pdf (chesapeakestormwater.net)

7.3.1 PROTECTIVE BARRIERS/WALLS (10%)

This practice includes installing brick, cinder block or similar materials formed into a wall or similar barrier (i.e., stair or "step up") to help to prevent the intrusion of flood waters.

7.3.2 PERMANENT DOORWAY FLOOD GATE OR PANEL (10%)

Permanent doorway flood gates or panels are physical barriers that attach to external doorframe and are always deployed to prevent floodwaters from entering a structure. They are opened and closed as entry is required to the building.

Permanent doorway flood panel

7.3.3 PASSIVE FLOOD GATES (10%)

Passive flood gates will automatically deploy using hydrostatic pressure from rising floodwater during flooding events to protect the entry point. These do not require electricity nor an external person to activate the system.

Passive flood gate at entrance to parking garage

SOURCE: CITY OF ALEXANDRIA

7.3.4 FLOODPROOF WINDOWS (10%)

Permanent glass protection can prevent flood damage from flooding and other extreme weather events. Floodproof windows or those with glass protection are passive systems that protect from rising flood water and debris impact.

7.3.5 BASEMENT WINDOW PROTECTION (10%)

Basement window protection consists of fixed, translucent, water-tight covers that are installed on near grade or below grade basement windows.

7.3.6 GROUND FLOOR/BASEMENT CUSTOM WINDOW WELLS (10%)

Custom window wells include a central drain that is either connected to an interior or exterior drain tile system or to a line that runs to a stormwater drain or out to daylight. These practices are installed at near grade and at-grade windows to prevent intrusion of flood waters.

7.3.7 FRENCH DRAIN AROUND BASEMENT (10%)

French drains collect and direct runoff and groundwater away from a home's foundation.

French drain around basement

SOURCE: CITY OF ALEXANDRIA

7.3.8 IMPERMEABLE (WATER RESISTANT) MATERIAL BARRIER AT FOUNDATION (10%)

This includes installing impermeable or water-resistant materials around the foundation of your home to reduce intrusion of surface flood waters.

7.3.9 CONCRETE SEALER (5%)

Applying waterproofing compounds such as polyurethane and thick rubberized liquids to interior concrete surfaces will decrease their water absorbency and create an impermeable water barrier to protect basements and lower levels of buildings.

7.3.10 CONSTRUCT WITH FLOOD RESISTANT BUILDING MATERIALS (5%)

Flood resistant building materials are able to withstand direct and prolonged contact with floodwaters without sustaining significant damage. The term "prolonged contact" means at least 72 hours, and the term "significant damage" means any damage requiring more than cosmetic repair.

7.3.11 ELEVATE EXTERIOR UTILITIES AND SERVICE EQUIPMENT (5%)

For external utilities such as heat pumps and Heating, Ventilation, and Air Conditioning (HVAC) elevate with cement blocks to an elevation outside of the floodplain.

Elevated exterior HVAC equipment
SOURCE: FEMA

7.4 CREDIT CALCULATION EXAMPLES FOR RESIDENTIAL CONDOMINIUM ASSOCIATIONS

7.4.1 STORMWATER MANAGEMENT EXAMPLE

A condominium association installed a bioretention facility as a condition of development that treats 45% of the impervious area. The condominium building is made up of 120 privately owned condominiums.

Step 1: Calculate Percentage of Fee Reduction

Based on the credits presented in Table 5, the maximum credit for a bioretention facility is 20%. 45% of the impervious cover on the property is directed to the new bioretention facility, therefore the total credit for this condominium association is 9%, as shown below:

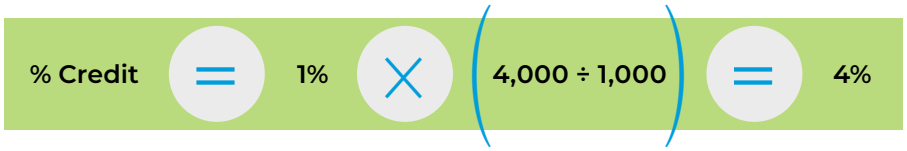
% Credit = **Maximum credit** × **Percent of impervious cover treated** = (**20% x 45%**) = **9%**

Step 2: Calculate Amount of Credit

Each of the 120 condominium owners in the building pay an annual fee of $82.32.[6] The 9% credit would be applied to each of the properties in the association. Based on the percentage fee reduction from Step 1, the credit for the property owners is:

7.4.2 URBAN NUTRIENT MANAGEMENT EXAMPLE

A condominium association has a large grassed common area that they plan to cover under an Urban Nutrient Management Plan. A total area of 4,200 sq. ft. is covered under the plan. The area is between 4,000 and 5,000 sq. ft., the credit is based on 4,000 sq. ft. With a credit of 1% for every 1,000 sq. ft. of property covered by the plan, the credit is calculated as follows:



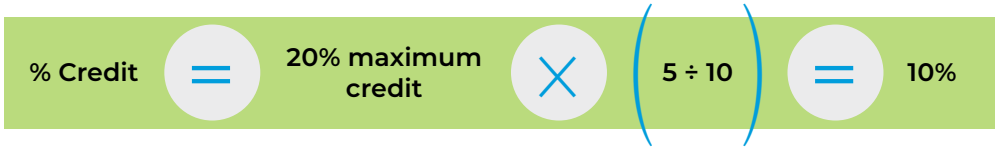
Each of the condominium owners within this association would receive a 4% credit.

7.4.3 NEW TREE PLANTING EXAMPLE

A condominium association with 50 units plants 4 new trees around their property. From Table 6, the number of trees for maximum credit would be 25 new native trees. Plugging into the formula would provide a credit of 4.8% for each of the condominium owners within the association.

7.4.4 MATURE TREE PRESERVATION EXAMPLE

A condominium association with 100 units preserves 5 mature trees on their property. From Table 7, the number of trees for maximum credit would be 10 mature trees. Plugging into the formula would provide a credit of 10% for each of the condominium owners within the association.



7.4.5 DRY FLOODPROOFING EXAMPLES

7.4.5.1 Garden Style Condominium Example

A condominium association consists of 10 separate buildings, with each building containing 4 separate condominiums (2 on the top floor, 2 on the ground floor). One of the buildings is in an area that is prone to regular flooding, so the condominium association installs permanent doorway flood gate at the main

6 Example uses the Fiscal Year 2023 rate

entrance of the flood prone building. A condo owner on the ground floor of the flood prone building decides to install floodproof windows to their condominium. The condominium association inspects and maintains the flood gate while the condominium owner inspects and maintains the floodproof windows. The condominium association applies for the flood gate credit on behalf of all condominium owners in that building. The condominium owner who installed floodproof windows would apply for the credit based on Section 6.

Step 1: Calculate Percentage of Fee Reduction

Based on the credits presented in Table 5, each dry floodproofing practices is 10%.

Step 2: Calculate Amount of Credit for Condominium Owners in Building

Each of the condominiums within the building with the flood gate pay an annual fee of $82.32.[7] The 10% credit would be applied to each condominium owner in that building but not each owner in the association. Based on the percentage from Step 1, the credit for these property owners is:

Credit for condominiums in dry floodproofed building = ($82.32 x 10%) = **$8.32**

Step 3: Calculate Amount of Credit for Ground Floor Condominium Owner

The ground floor unit installed floodproof windows for an additional 10% credit. The owner would apply using Section 6 of the manual. Since the owner is both in the protected building and installed an additional dry floodproofing practice of floodproof windows, the credit percentage is 20%. Based on this percentage, the credit for this property owners is:

Credit for ground floor condominium owner in dry floodproofed building with floodproof windows = ($82.32 x 20%) = **$16.46**

7.4.5.2 High Rise Condominium Example

Step 1: Calculate Percentage of Fee Reduction

A high-rise condominium association with 200 residential condominiums installs, inspects, and maintains permanent doorway flood panels and floodproof windows on the building. Based on the credits presented in Table 5, the total credit for the two dry flood proofing practices is 20% as shown below:

PRACTICE	CREDIT
Floodproof Windows	10%
Flood Gate or Panel	10%
Total	20%

7 Example uses the Fiscal Year 2023 rate

Step 2: Calculate Amount of Credit

Each of the condominiums within the condominium association pay an annual fee of $82.32.[8] The 20% credit would be applied to each condominium in the association. Based on the percentage fee reduction from Step 1, the credit for these property owners as follows:

Residential condominiums credit = ($82.32 x 20%) = $16.46

7.4.6 MULTIPLE PRACTICES COMBINATION EXAMPLE

A garden-style condominium association consists of 24 residential condominiums. The condominium association installed permeable pavement in the parking stalls of the parking lot. 40% of the impervious area of the site drains to the permeable pavement. In addition, the association planted 4 new trees next to the parking lot.

Step 1: Calculate Percentage of Fee Reduction

Based on the credits presented in Table 5, the maximum credit for permeable pavement is 20%. 40% of the impervious cover on the property is directed to the permeable pavement, therefore the total credit for this practice is shown below:

% Credit = **Maximum credit** × **Percent of impervious cover treated** = (**20% x 40%**) = **8%**

Based on the credits presented in Table 6, the number of trees for maximum credit would be 12 new native trees. Plugging into the formula would provide a credit of 10% for each of the condominium owners within the association.

% Credit = **30% Maximum One-Time Credit** × (**4 ÷ 12**) = **10%**

Each of the condominiums in the association would receive a total credit of 18%.

Step 2: Calculate Amount of Credit

Each of the condominiums within the condominium association pay an annual fee of $82.32.[9] The 18% credit would be applied to each condominium in the association. Based on the percentage fee reduction from Step 1, the credit for these property owners is:

Residential condominiums credit = ($82.32 x 18%) = $14.82

8 Example uses the Fiscal Year 2023 rate

9 Example uses the Fiscal Year 2023 rate

8. Non-Residential Properties Credit Menu

Non-residential properties include commercial, industrial, institutional, non-profit, faith-based, and other properties not included in the residential category. The fee structure for non-residential properties is calculated by assessing the impervious area on the property. Non-residential properties are eligible for credits by installing and maintaining stormwater management practices, planting, and maintaining eligible landscaping, installing and maintaining dry floodproofing practices, and performing eligible volunteer activities. Existing stormwater management practices may also be eligible for credit.

Credits may be combined for a **maximum 50% reduction**. Non-residential properties are required to **reapply for credits every two (2) years** to continue receiving a fee reduction.

> Maximum 50% SWU fee reduction
> Reapply every two (2) years

Stormwater management credits presented in Table 8 are based on the site's impervious area that drains to the practice. Dry floodproofing credits in Table 8 are based on the protected building footprint and applied as flat credits for all property owners within the impacted building(s) where a practice is installed. Example credit calculations are presented in Section 8.4. Unless otherwise noted, credits will be applied to your annual fee for a period of two (2) years, and practices from this list can be combined for a total credit up to 50%.

TABLE 8. NON-RESIDENTIAL PROPERTIES CREDIT MENU

PRACTICE		MAXIMUM CREDIT
Stormwater Management Practices	Detention Facility	20%
	Infiltration Practice	20%
	Bioretention Facility	20%
	Dry Swale	20%
	Wet Swale	20%
	Grass Channel	20%
	Permeable Pavement	20%
	Rainwater Harvesting	20%
	Rooftop/Impervious Area Disconnection	20%
	Sheet flow to a Vegetated Filter Strip or Conserved Open Space	20%
	Soil Compost Amendment	20%
	Vegetated Green Roof	20%
	Additional Stormwater Quality Practices[a]	20%
Eligible Landscaping Practices	Urban Nutrient Management Plan	Up to 10% (1% for each 1,000 sq. ft. in plan)
	New Tree Planting	Up to 30% (one-time credit)
	Mature Tree Preservation	Up to 20%
Dry Floodproofing Practices	Protective Barriers/Walls	10%
	Permanent Doorway Flood Gate or Panel	10%
	Passive Flood Gates	10%
	Floodproof Windows	10%
	Basement Window Protection	10%
	Ground Floor/Basement Custom Window Wells	10%
	French Drain Around Basement	10%
	Impermeable (Water Resistant) Material Around Foundation	10%
	Concrete Sealer	5%
	Construct with Flood Resistant Building Materials	5%
	Elevate Exterior Utilities and Service Equipment	5%
Volunteer Activities[b]	Adopt-A-Block	Up to 10%
	Adopt-A-Storm Drain	Up to 10%
	Adopt-A-Waterway	Up to 10%

a. Approved stormwater practices in the BMP Clearinghouse may be eligible for credits on a case-by-case bases. See 2011 design specifications for approved practices at https://swbmp.vwrrc.vt.edu/

b. Credits for Volunteer Activities must be renewed annually

8.1 STORMWATER MANAGEMENT PRACTICES

Descriptions of the eligible stormwater management practices are presented below.

8.1.1 DETENTION PRACTICES (UP TO 20%)

Stormwater detention facilities are often installed during construction as a condition of development to reduce localized flooding. Typically, a detention facility is a large underground storage pipe/vault or a pond that temporarily holds runoff during rain events and then discharges it slowly to the storm sewer system.

Dry detention basin
SOURCE: CITY OF ALEXANDRIA

8.1.2 INFILTRATION PRACTICES (20%)

Infiltration practices use temporary surface or underground storage to allow stormwater runoff to slowly infiltrate into the underlying soils. Infiltration practices involve installing a series of layers of rock and soil media below the soil surface. Infiltration practices have the greatest runoff reduction capability of any stormwater practice and are suitable for use in many residential and other urban areas where measured soil permeability rates exceed ½ inch per hour. Property owners interested in installing an infiltration practice must conduct a soil permeability analysis.

8.1.3 BIORETENTION FACILITY (UP TO 20%)

Bioretention practices use vegetation and soil media to aid in the infiltration and storage of rainfall and stormwater runoff. Natural underlying soils are replaced with a soil mix to increase infiltration and a mix of native plants are planted to help filter out pollutants.

Bioretention facility
SOURCE: CITY OF ALEXANDRIA

8.1.4 DRY SWALE (UP TO 20%)

Dry swales are like bioretention cells but are shallower and configured as linear channels covered with turf instead of mulch and vegetation. Rainfall and stormwater runoff enter the channel and are temporarily stored and then filter through the turf and underlying soil mix.

8.1.5 WET SWALE (UP TO 20%)

Wet swales are a cross between a wetland and a dry swale. Wet swales are made up of saturated soils and wetland vegetation that provide moderate pollutant reduction through gravitational settling, biological uptake of pollutants through the vegetation present, and microbial activity.

8.1.6 GRASS CHANNEL (UP TO 20%)

Grass channels provide stormwater runoff filtering and increased infiltration. Grass channels are linear practices and can be applied in a series of multiple channels in a row.

8.1.7 PERMEABLE PAVEMENT (UP TO 20%)

Permeable pavement is a hard surface that has enough gaps in it to allow rain to run through it. When rain runs through permeable pavement, it collects in a base layer of gravel, then gradually soaks into the ground. Interlocking paver blocks or permeable pavement can be used for driveways, parking lots, and other surfaces that would typically be paved with asphalt or concrete. The purpose of this credit is for permeable pavement to be used as a BMP with stormwater runoff being directed to the permeable pavement location. For permeable pavement that is not used to treat additional stormwater runoff, an impervious reduction can be offered.

8.1.8 RAINWATER HARVESTING (UP TO 20%)

Rainwater Harvesting Practices are used to capture roof runoff in a barrel or tank (cistern) which can then slowly empty into the surrounding landscape or be reused for outdoor irrigation/watering and/or for selected indoor uses.

Wet swale
SOURCE: CHESAPEAKESTORMWATER.NET

Permeable pavement
SOURCE: CITY OF ALEXANDRIA

Cistern
SOURCE: CITY OF ALEXANDRIA

8.1.9 ROOFTOP/IMPERVIOUS AREA DISCONNECTION (UP TO 20%)

There are two types of rooftop disconnection including (1) simple disconnection, where rooftop drains are directed towards pervious areas like turf, and (2) disconnection which leads to another green infrastructure practice for additional water quality and quantity treatment. Property owners must use the second type of disconnection and include other practices to be eligible for credit, such as a dry well, rain garden, storage in a rain barrel, etc. These practices manage the stormwater runoff coming from rooftop drains by slowing the water to allow for greater infiltration, filtration, and in some cases reuse.

8.1.10 SHEET FLOW TO A VEGETATED FILTER STRIP OR CONSERVED OPEN SPACE (UP TO 20%)

This practice involves managing runoff from impervious areas and turf as sheet flow by spreading the flow out across an area instead of concentrating flow in a pipe or channel. This can be done by using gravel trenches or level spreaders to discharge flow to vegetated filter strips or areas of undisturbed land called conserved open space. Vegetated filter strips include areas with amended soils and dense turf cover or landscapes areas with trees, shrubs, and other herbaceous cover.

8.1.11 VEGETATED GREEN ROOF (UP TO 20%)

A vegetated green roof is a layer of vegetation planted over a waterproofing system that is installed on top of a flat or slightly sloped roof which stores and filters rainfall using a layer of soil media and specialized vegetation. Green roofs must be designed and installed by a qualified designer and contractor.

Vegetated green roof
SOURCE: CITY OF ALEXANDRIA

8.1.12 ADDITIONAL STORMWATER QUALITY PRACTICES (20%)

There are additional stormwater quality BMPs that are eligible for credits, which can be found in the Virginia Stormwater BMP Clearinghouse. These include non-proprietary and proprietary practices such as hydrodynamic separators and filtering devices.

Tree box filter
SOURCE: CITY OF ALEXANDRIA

8.2 ELIGIBLE LANDSCAPING PRACTICES

Descriptions of the eligible landscaping practices are presented below.

8.2.1 URBAN NUTRIENT MANAGEMENT PLAN (UP TO 10%)

An urban nutrient management plan is a plan prepared by a Virginia certified nutrient management planner to manage the amount, placement, timing and application of fertilizer, compost, or other materials containing plant nutrients to reduce nutrient loss to the environment and to produce quality turf and landscape plants.

Non-Residential property owners are eligible for stormwater utility fee credit for voluntarily developed nutrient management plans at a rate of 1% fee credit for every 1,000 sq. ft. of property covered by the plan, up to a maximum 10% credit. The minimum property coverage for credit is 1,000 sq. ft., and for coverage falling between 1,000 sq. ft. intervals, coverage will be rounded down to the nearest 1,000 sq. ft.

Fertilizer application
SOURCE: CITY OF ALEXANDRIA

8.2.2 NEW TREE PLANTING (UP TO 30%)

Planting new trees helps to increase our existing tree canopy, which can slow runoff rates, reducing stress on the stormwater drainage infrastructure by reducing peak flow rates. Non-residential property owners can apply for a **one-time credit** for the purchase, installation, and initial maintenance of new trees planted on the non-residential property.

New Tree Planting is calculated using the following formula:

% Credit = **30% maximum one-time credit** × (**Number of trees planted** ÷ **Number of trees for maximum credit**)

Table 9 includes the number of trees that must be planted by property type to receive this one-time credit.

TABLE 9. REQUIRED NUMBER OF NEW TREES BY PROPERTY TYPE FOR MAXIMUM CREDIT

PROPERTY TYPE	NUMBER OF TREES FOR MAXIMUM CREDIT
Non-Residential	2 new native trees per ERU

Tree selection should be appropriate for the planting site. Standards for tree planting, including a list of suggested tree varieties, can in the most recent version of the City's Landscape Guidelines. New trees must be non-invasive and native to Virginia or the Chesapeake Bay region with a minimum 1" to 2" caliper. Tree caliper is a standardized measurement of the tree diameter. For 1" and 2" caliper trees, the

diameter of the tree trunk is measured at 6" above the ground. Eligible trees are those planted within the property boundaries and not part of another stormwater BMP like bioretention or a rain garden. Trees must not have been planted as part of a mandatory condition of development. The applicant property must not be under development or within the time frame of the maintenance bond at the time new trees are planted.

8.2.3 MATURE TREE PRESERVATION (UP TO 20%)

Preserving the existing tree canopy is critical to stormwater management because mature trees intercept rainfall that would otherwise run off paved surfaces and be transported to the stormwater drainage system and our local waterways. Mature trees that are eligible for this credit must be established, have a trunk that is at least 12 inches in diameter at breast height,[10] which is 4 ½ feet from the ground.

Mature tree preservation is calculated using the following formula:

% Credit = 20% maximum × (Number of trees planted ÷ Number of trees for maximum credit)

Table 10 includes the number of mature trees that must be preserved by property type to receive this one-time credit.

TABLE 10. REQUIRED NUMBER OF MATURE TREES BY PROPERTY TYPE FOR MAXIMUM CREDIT

PROPERTY TYPE	NUMBER OF TREES FOR MAXIMUM CREDIT
Non-Residential	1 mature tree per ERU

8.3 DRY FLOODPROOFING PRACTICES

Dry floodproofing includes practices that keep a building and associated equipment and utilities dry by not allowing floodwaters to enter a structure. Dry floodproofing practices protect your home or business from water damage from flood waters and these practices protect water quality by preventing flood waters from contacting pollutants that are present in basements and other structures. Once flood waters recede, polluted water that has collected in basements, parking garages and other structures is typically pumped into the storm sewer system, which is discharged without

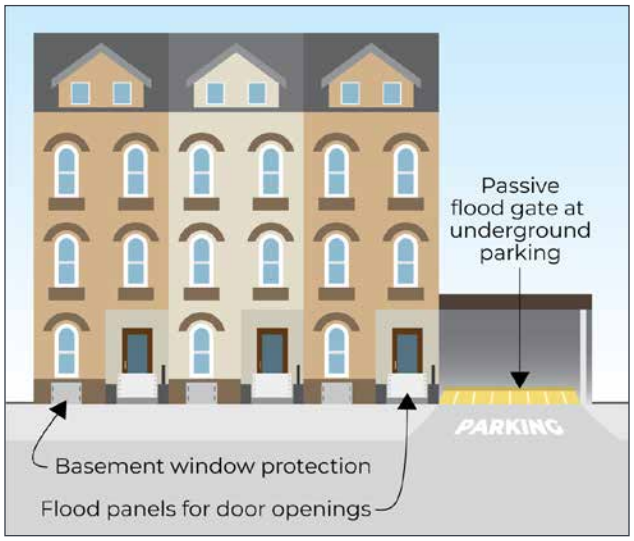


FIGURE 6. EXAMPLES OF DRY FLOODPROOFING FOR NON-RESIDENTIAL PROPERTIES

10 Source: Recommendations of the Expert Panel to Define BMP Effectiveness for Urban Tree Canopy Expansion 7222-1.pdf (chesapeakestormwater.net)

treatment to surface water bodies. Descriptions of the eligible dry floodproofing practices are presented below.

8.3.1 PROTECTIVE BARRIERS/WALLS (10%)

This practice includes installing brick, cinder block or similar materials formed into a wall or similar barrier (i.e., stair or "step up") to help to prevent the intrusion of flood waters.

8.3.2 PERMANENT DOORWAY FLOOD GATE OR PANEL (10%)

Permanent doorway flood gates or panels are physical barriers that attach to external doorframe and are always deployed to prevent floodwaters from entering a structure. They are opened and closed as entry is required to the building.

Permanent doorway flood panel

8.3.3 PASSIVE FLOOD GATES (10%)

Passive flood gates will automatically deploy using hydrostatic pressure from rising floodwater during flooding events to protect the entry point. These do not require electricity nor an external person to activate the system.

Passive flood gate at entrance to parking garage
SOURCE: CITY OF ALEXANDRIA

8.3.4 FLOODPROOF WINDOWS (10%)

Permanent glass protection can prevent flood damage from flooding and other extreme weather events. Floodproof windows or those with glass protection are passive systems that protect from rising flood water and debris impact.

8.3.5 BASEMENT WINDOW PROTECTION (10%)

Basement window protection consists of fixed, translucent, water-tight covers that are installed on near grade or below grade basement windows.

8.3.6 GROUND FLOOR/BASEMENT CUSTOM WINDOW WELLS (10%)

Custom window wells include a central drain that is either connected to an interior or exterior drain tile system or to a line that runs to a stormwater drain or out to daylight. These practices are installed at near grade and at-grade windows to prevent intrusion of flood waters.

8.3.7 FRENCH DRAIN AROUND BASEMENT (10%)

French drains collect and direct runoff and groundwater away from a home's foundation.

8.3.8 IMPERMEABLE (WATER RESISTANT) MATERIAL BARRIER AT FOUNDATION (10%)

This includes installing impermeable or water-resistant materials around the foundation of your home to reduce intrusion of surface flood waters.

8.3.9 CONCRETE SEALER (5%)

Applying waterproofing compounds such as polyurethane and thick rubberized liquids to interior concrete surfaces will decrease their water absorbency and create an impermeable water barrier to protect basements and lower levels of buildings.

8.3.10 CONSTRUCT WITH FLOOD RESISTANT BUILDING MATERIALS (5%)

Flood resistant building materials are able to withstand direct and prolonged contact with floodwaters without sustaining significant damage. The term "prolonged contact" means at least 72 hours, and the term "significant damage" means any damage requiring more than cosmetic repair.

8.3.11 ELEVATE EXTERIOR UTILITIES AND SERVICE EQUIPMENT (5%)

For external utilities such as heat pumps and Heating, Ventilation, and Air Conditioning (HVAC) elevate with cement blocks to an elevation outside of the floodplain.

French drain around basement
SOURCE: CITY OF ALEXANDRIA

8.4 VOLUNTEER ACTIVITIES

Performing volunteer activities allow residents to earn credit by taking action to improve local water quality and the Chesapeake Bay. The City recognizes the value that volunteers offer in keeping our waterways, roadsides, and storm drains free of litter and excess debris that can inhibit their full functionality and beneficial uses. Credits are provided for participation in one or all three litter cleanup programs offered: Adopt-A-Block, Adopt-A-Storm Drain, and Adopt-A-Waterway. **Unlike other credit practices described in this manual, these activities must be performed annually to continue receiving credits.**

8.4.1 ADOPT-A-BLOCK (UP TO 10%)

Non-residential property owners may earn up to a maximum 10% fee reduction for 25 hours of litter cleanup activities through participation. Only hours spent on litter cleanup qualify for potential credit. Hours spent on planning, preparation, and travelling do not qualify. To participate, groups of volunteers for the non-residential property adopt a section of roadway and collect and dispose of

Adopt-a-Block volunteers
SOURCE; CITY OF ALEXANDRIA

trash and litter. Volunteer groups must adopt a minimum of four blocks encompassing both sides of the roadway.

Annual registration is required prior to the performance of a qualifying litter cleanup activities. Volunteers or groups wishing to participate in the Adopt-A-Block Program for potential credits must contact the City's Stormwater Utility staff at stormwater@alexandriava.gov to register the roadway blocks the group intends to adopt. Registration is complete when the City receives a signed agreement by the group leader. The agreement includes what's adopted, by whom, who'll get potential credit, and covers basic safety requirements.

The credit is calculated to the nearest tenth of a percent using the following formula:

8.4.2 ADOPT-A-STORM DRAIN (UP TO 10%)

Non-residential property owners may earn up to a maximum 10% fee reduction for the adoption of 25 private storm drains through program participation. Only hours spent on litter cleanup qualify for potential credit. Hours spent on planning, preparation, and travelling do not qualify. To participate in the program, groups of volunteers or the property owner's representative adopt a group of private storm drains ensure that storm drain openings remain reasonably free of debris and obstructions that may impair their functionality. Volunteer groups must adopt a minimum of five (5) privately owned storm drains within the property and perform a minimum of four (4) quarterly cleanups in a year.

Annual registration is required prior to the performance of a qualifying litter cleanup activities. Volunteers or groups wishing to participate in the Adopt-A-Storm Drain Program for potential credit must contact the City's Stormwater Utility staff at stormwater@alexandriava.gov to register which storm drains the group will be adopting. Registration is complete when the City receives a signed agreement by the group leader. The agreement includes what's adopted, by whom, who'll get potential credit, and covers basic safety requirements.

The credit is calculated for the Adopt-A-Storm Drain credit to the nearest tenth of a percent using the following formula:

8.4.3 ADOPT-A-WATERWAY (UP TO 10%)

Non-residential property owners may earn up to a maximum 10% fee reduction for 25 hours of litter cleanup activities by participating in the program. Only hours spent on litter cleanup qualify for potential credit. Hours spent on planning, preparation, and travelling do not qualify. To participate, groups of volunteers f adopt a section of waterway and remove trash along stream banks and shorelines to enhance and improve the City's natural waterways and streams. Groups must have enough volunteers to ensure a successful event, with at least one participant required for every approximate 20 linear feet of stream or channel bank. The adopted waterway must be within City limits.

Annual registration is required prior to the performance of a qualifying litter cleanup activities. Volunteers or groups wishing to participate must contact the City's Stormwater Utility staff at stormwater@alexandriava.gov to register which section of the waterway the group will be adopting. Registration is complete when the City receives a signed agreement by the group leader. The agreement includes what's adopted, by whom, who'll get potential credit, and covers basic safety requirements.

Adopt-A-Waterway is calculated to the nearest tenth of a percent using the following formula:

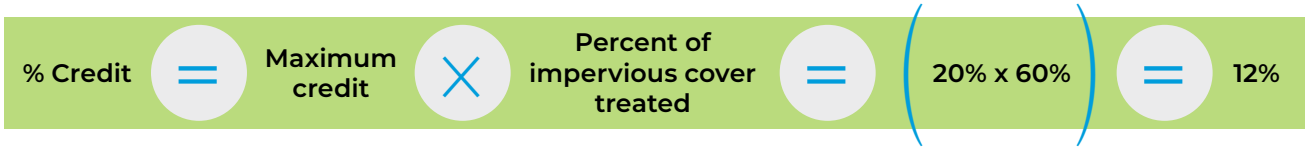
8.5 CALCULATION EXAMPLES FOR NON-RESIDENTIAL PROPERTIES

8.5.1 STORMWATER MANAGEMENT EXAMPLE

A large commercial property was required to install a wet pond as part of a condition of development.

Step 1: Calculate Percentage of Fee Reduction

Based on the credits presented in Table 8, the maximum credit for a wet pond is 20%. 60% of the impervious cover on the property is directed to the wet pond, therefore the total credit for this non-residential property is 12%, as shown below:

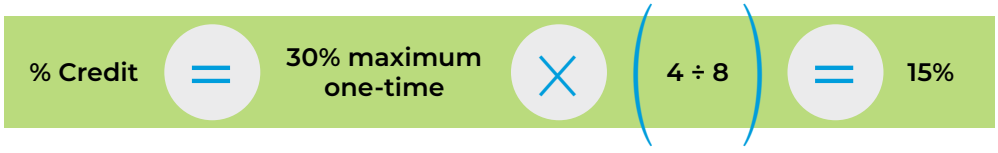


Step 2: Calculate Amount of Credit

The commercial property pays $18,522[11] a year based on a calculated fee for 63 billing units/ERUs (130,000 sq. ft. of impervious cover). Based on the percentage fee reduction from Step 1, the credit for the non-residential property owner is:

8.5.2 NEW TREE PLANTING EXAMPLE

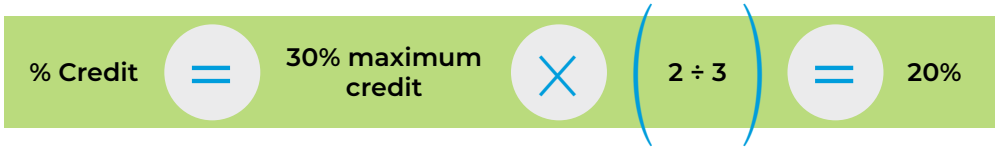
A commercial property wants to plant four new native trees along the edge of their parking lot. This property pays a fee for 4 ERUs (8,200 sq. ft. of impervious area). Based on Table 9, the owner would need to plant at least eight (8) trees to receive the maximum credit. Plugging into the formula would provide a credit of 15%.



11 Example uses the Fiscal Year 2023 rate

8.5.3 MATURE TREE PRESERVATION EXAMPLE

A commercial property wants to preserve two mature trees. This property pays a fee for 3 ERUs (6,200 sq. ft. of impervious area). Based on Table 10, the owner would need to preserve at least three (3) trees to receive the maximum credit. This property would receive a 20% credit.



8.5.4 DRY FLOODPROOFING EXAMPLE

Step 1: Calculate Percentage of Fee Reduction

A car dealership installs passive flood gates on its parking garage and floodproof windows on the lower-level windows of their building. The total credit is 20% for these two practices.

PRACTICE	CREDIT
Passive Flood Gate	10%
Floodproof Windows	10%
Total	20%

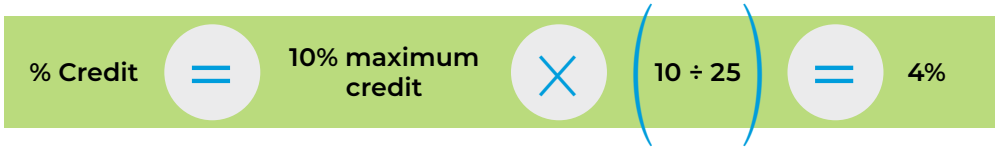
Step 2: Calculate Amount of Credit

The commercial property pays $2,940[12] a year based on a calculated fee for 10 ERUs for the whole property. However, the building and parking garage has a footprint of 4,200 sq. ft. for a building footprint of 2 ERUs. Based on the percentage fee reduction from Step 1, the credit for the non-residential property owner is:

8.5.5 VOLUNTEER ACTIVITY EXAMPLES

8.5.5.1 Adopt-A-Block

A group registers for the Adopt-A-Block program. During the two-year cycle, the group performs a 1-hour long Adopt-A-Block cleanup event with 10 participants. The total number of Adopt-A-Block cleanup hours performed that cycle is 10 hours. Plugging into the formula would provide a credit of 4%.

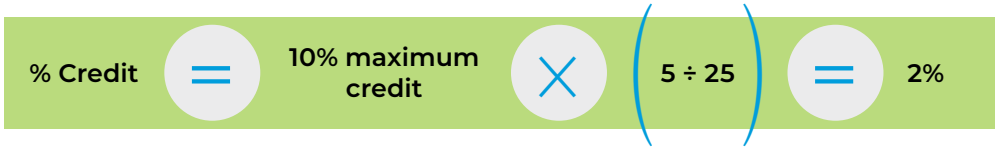


The non-residential property associated with the group and identified in the registration agreement has an annual stormwater utility fee of $1,000. Given the 4% fee credit, the amount of the credit applied to the property is $40.

12 Example uses the Fiscal Year 2023 rate

8.5.5.2 Adopt-A-Storm Drain

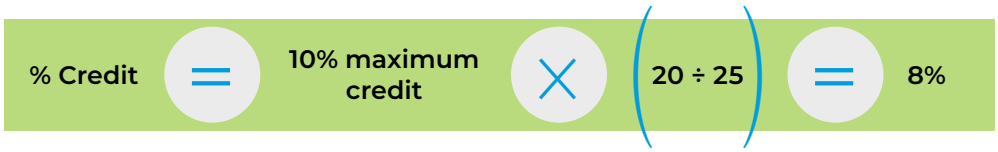
A group registers for the Adopt-A-Storm Drain program. During the year, the group adopts five storm drains within its property and performs cleanups of the adopted drains once every three months. The total number of storm drains adopted is five (5). Plugging into the formula would provide a credit of 2%.



The non-residential property associated with the group and identified in the registration agreement has an annual stormwater utility fee of $2,000. Given the 2% credit, the amount of the credit applied to the property is $40.

8.5.5.3 Adopt-A-Waterway

A group registers for the Adopt-A-Waterway program. Each year, the group performs a 2-hour long Adopt-A-Waterway cleanup event with 10 participants. The total number of Adopt-A-Waterway cleanup hours performed that cycle is 20 hours. Plugging into the formula would provide a credit of 8%.



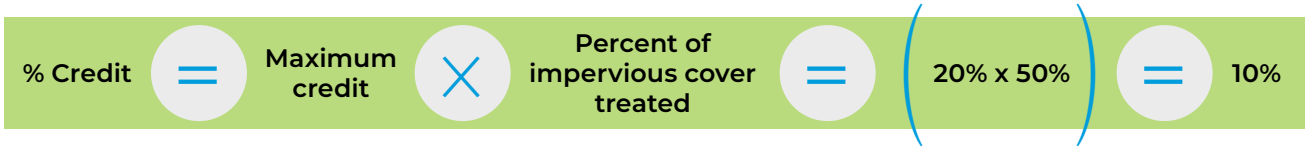
The non-residential property associated with the group and identified in the registration agreement has an annual stormwater utility fee of $1,000. Given the 8% fee credit, the amount of the credit applied to the property is $80.

8.5.6 MULTIPLE PRACTICE COMBINATION EXAMPLE

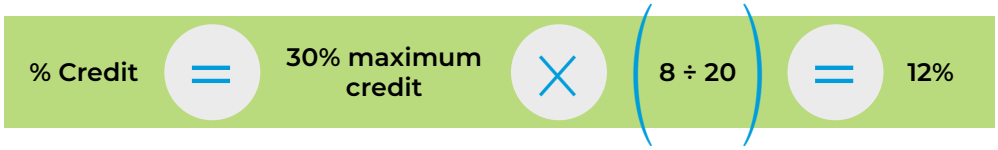
A commercial property with large, grassed lawn develops an urban nutrient management plan, plants 8 new trees and has an approved stormwater quality BMP that was installed as part of a condition of development. The property pays a fee that is based on 10 ERUs.

Step 1: Calculate Percentage of Fee Reduction

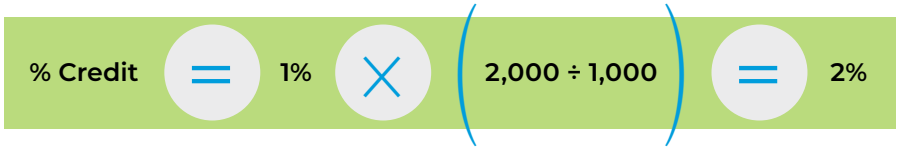
Based on the credits presented in Table 8, the maximum credit for the stormwater quality BMP is 20%. 50% of the impervious cover on the property is directed to the permeable pavement, therefore the total credit for this practice is shown below:



Based on the credits presented in Table 8, the number of trees for maximum credit would be 20 new native trees. Plugging into the formula would provide a one-time credit of 12% for planting trees.



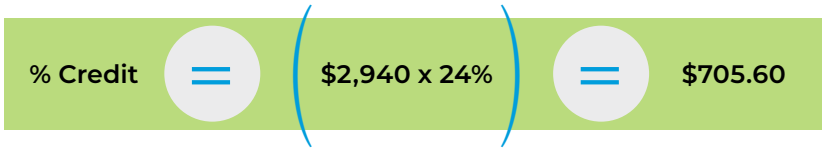
A total area of 2,000 sq. ft. is covered under the plan. With a credit of 1% for every 1,000 sq. ft. of property covered by the plan, the credit is calculated as follows



The commercial property would receive a credit of 24% for the three practices.

Step 2: Calculate Amount of Credit

The commercial property pays $2,940 a year based on a calculated fee for 10 billing units/ERUs. Based on the percentage fee reduction from Step 1, the credit for the non-residential property owner is:



9. Application Requirements

Interested property owners must submit a complete SWU Fee Credit Application with all required supporting documentation to the City's Department of Transportation and Environmental Services, Stormwater Division.

9.1 HOW TO APPLY

Property owners that wish to apply for a credit must gather the required documentation (see Section 9.2 below) and complete the Application for their property type (Residential, Condominium Association or Non-Residential), which can be viewed in Appendix B.

> Apply every two (2) years
> from December 1 – February 15

Complete and submit application and documentation online during the annual credit application window. Property owners may apply online through the Real Estate Assessment Search or visit Environmental Quality Forms to access the downloadable paper applications.

The City will review the application and notify the applicant to request missing or additional information during the application window to facilitate application review. If requested information is not received your application will be deemed incomplete and will be denied.

Approved credits will be applied for two full calendar years from the date of approved application, split equally between two calendar-year billing cycles with exception of volunteer activities which must be reapplied for each year.

9.2 DOCUMENTATION REQUIREMENTS

Eligible property owners seeking a credit must comply with the following documentation requirements.

9.2.1 RESIDENTIAL PROPERTY DOCUMENTATION REQUIREMENTS

Documentation for new residential property credit applications consist of:

- Providing photographic evidence (one or more date-stamped digital photos) of the practice(s) applied. Photos should demonstrate the practice(s) as implemented or installed. For specific applications that have multiple practices, please include a photo for each creditable practice (i.e., multiple trees for planting or preservation credit).
- Provide a completed credit application for Residential Properties. By signing the credit application, the applicant is self-certifying to the City that the practices have been installed according to

applicable City, State, or Federal design requirements and have been maintained to their original design capability or specification.

Residential credits are applied for two (2) years. If a property owner wishes to renew a previously awarded credit for the same practice as previously awarded, the applicant only needs to fill out the credit application and provide updated photo documentation as described above. Once approved, the credit will be valid for another two (2) year period.

9.2.2 CONDOMINIUM ASSOCIATION DOCUMENTATION REQUIREMENTS

Documentation for condominium association credit applications consist of:

- Providing photographic evidence (one or more date-stamped digital photos) of the practice(s) applied. Photos should demonstrate the practice(s) as implemented or installed. For specific applications that have multiple practices, please include a photo for each creditable practice (i.e., multiple trees for planting or preservation credit).
- Provide a completed credit application for Condominium Associations. By signing the credit application, the applicant is certifying to the City that the practices have been installed according to applicable City, State, or Federal design requirements and have been maintained to their original design capability or specification.
- To receive credits for BMPs that were a condition of site development a Certification Form must be completed by a qualified professional with every application cycle.

Condominium Association credits are applied for two (2) years. If a condo association wishes to renew a previously awarded credit for the same practice as previously awarded, the applicant only needs to fill out the credit application, provide updated photo documentation as described above, and a certification form for condition of site development BMPs. Once approved, the credit will be valid for another two (2) year period.

9.2.3 NON-RESIDENTIAL PROPERTY DOCUMENTATION REQUIREMENTS

Documentation for non-residential property credit applications consist of:

- Providing photographic evidence (one or more date-stamped digital photos) of the practice(s) applied. Photos should demonstrate the practice(s) as implemented or installed. For specific applications that have multiple practices, please include a photo for each creditable practice (i.e., multiple trees for planting or preservation credit).
- Provide a completed credit application for Non-Residential Property. By signing the credit application, the applicant is certifying to the City that the practices have been installed according to applicable City, State, or Federal design requirements and have been maintained to their original design capability or specification.
- To receive credits for BMPs that were a condition of site development a Certification Form must be completed by a qualified professional with every application cycle.
- Documentation for Volunteer Activities includes the following for each eligible event:
  - Tally sheets;
  - Signed waivers/sign-in sheets; and
  - Date-stamped photos.

Non-residential property credits are applied for two (2) years except for volunteer activities. If a non-residential property wishes to renew a previously awarded credit for the same practice as previously awarded, the applicant only needs to fill out the credit application, provide updated photo documentation as described above, and a certification form for condition of site development BMPs. Once approved, the credit will be valid for another two (2) year period. For volunteer activity credits, an application with documentation is required annually.

9.3 REAL ESTATE ASSESSMENT SEARCH

Property owners can access their Stormwater fees through the Real Estate Assessment search just like they would for their real estate taxes. Property owners enter the street address of the subject property in Search by Address. The user then can click on Tax & Fee Info to view their Stormwater Fee. If the owner would like more information, they can scroll down to the bottom and click "View This Property on our Stormwater Map." This will take the owner to a map zoomed into their property with additional information, such as ERU, Fee Type and Rate. See Figure 7 for an example of the output from the Real Estate Assessment online search.

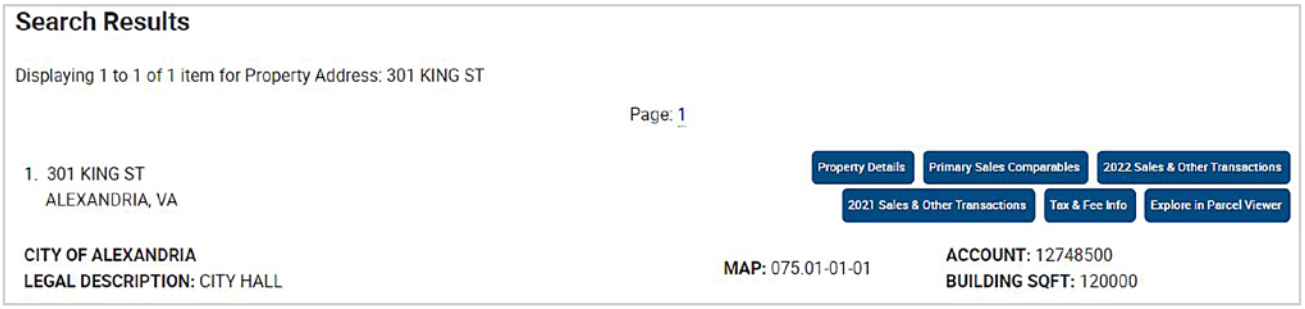


FIGURE 7. EXAMPLE OUTPUT FROM ONLINE REAL ESTATE ASSESSMENT SEARCH

9.4 LOCAL REQUIREMENTS

Practices applied for and receiving credit must meet all applicable City building, planning, zoning, and other requirements of the Zoning Ordinance and City Code. Property owners are encouraged to contact the City during the planning/permitting process to ensure proper selection of creditable stormwater practices and to understand additional development requirements that may apply.

9.5 RIGHT TO INSPECT

The City reserves the right to inspect a creditable practice at any time during the year. If the BMP is not functioning as approved or has not been maintained, the City may revoke the stormwater credit until the property owner proves that all maintenance work has been performed to return the BMP to a fully functional condition.

9.6 DENIAL OF CREDITS

Should the property owner be found to have failed to obtain a required permit for development, to have made an illicit connection to the storm drain system, made an illicit discharge to the MS4, or

otherwise submitted falsified information for the SWU Credit application, then the property owner will be ineligible for SWU credit the following credit year.

Illicit connection means either (i) any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-stormwater discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or (ii) any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.

Illicit discharge means any discharge to a municipal separate storm sewer system that is not comprised entirely of stormwater, except discharges pursuant to a Virginia Pollutant Discharge Elimination system or VSMP permit (other than the VSMP permit for discharges from the municipal separate storm sewer system), discharges resulting from firefighting activities, and discharges identified by and in compliance with 4 VAC 50-60-1220(C)(2).

Credits will not be provided to any person who does not obtain a stormwater permit from the DEQ when such permit is required by statute or regulation.

9.7 CONTACT US WITH QUESTIONS

https://alexandriava.gov/stormwater

stormwater@alexandria.gov

703-746-6499

City of Alexandria
Transportation & Environmental Services
Stormwater Management Division
2900-B Business Center Drive
Alexandria, VA 22314

Appendix A.
Technical Memorandum Documenting Rationale for SWU Credits for Dry Floodproofing (6-8-2022)

AECOM
222 Central Park Ave.
Suite 300
Virginia Beach, VA 23462
aecom.com

To:
Camille Liebnitzky, PE, Project Manager
Jesse Maines, MPA, Division Chief
T&ES Stormwater Management

From:
Noelle Slater, AECOM
Doug Mosely, GKY

Project name:
TO#43 Stormwater Utility Program Update

Project ref:
60664166

Date:
June 8, 2022

Memo

To address the City's ongoing flood mitigation efforts - and further mitigate the flood damage realized more frequently to City properties and infrastructure - the Department of Transportation and Environmental Services (T&ES) engaged AECOM and GKY to evaluate potential amendments to the City's Stormwater Utility (SWU) Fee Credit Program to introduce SWU fee credits for certain floodproofing measures. SWU fee credits for approved floodproofing measures would offer property owners potential, additional incentives to undertake flood mitigation efforts on private properties, while also reducing the impact of more frequent flooding on City services and infrastructure. Adding this SWU fee credit to the City's flood mitigation toolbox provides property owners with long-term return on private investments for flood mitigation efforts. Such mitigation efforts could yield significant benefit to the City, including reduced need for City services, retention of tax base, and reduced private property and public infrastructure damage from future flooding events; thus enhancing the City's flood resilience.

Specifically, T&ES is investigating the feasibility of adding "dry floodproofing" measures for private properties to the City's SWU Fee Credit Program menu. This technical memo speaks to two specific questions as part of this broader investigation:

- What floodproofing measures are considered "dry floodproofing?"
- Does the City have the authority to add such an option based on Virginia's enabling code section?

Dry Floodproofing

The Federal Emergency Management Agency (FEMA) defines dry floodproofing as "a combination of measures that make a building and attendant utilities and equipment watertight and substantially impermeable to floodwater, with structural components having the capacity to resist flood loads."[1] As such, dry floodproofing typically includes structural flood mitigation practices designed to keep flood waters out of a structure (as opposed to wet floodproofing which allows flood waters to flow into, and then out of, a structure). These will need to comply with Code Administration and Planning and Zoning requirements, as applicable. The City has developed a menu of permanent dry floodproofing practices to consider for incorporation into the SWU fee Credit Program, including:

- Window Protection

[1] Federal Emergency Management Agency, Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings Located in Special Flood Hazard Areas in Accordance with the National Flood Insurance Program, NFIP Technical Bulletin 3, January 2021, p.1.

    - Ground Floor/Basement Custom Window Well: A ground floor or basement window well should have a central drain that is either connected to an interior or exterior drain tile system or to a line that runs to a stormwater drain or outside the property. Installing a new drain requires soil excavation and either reinstalling or replacing the window well liner. Also, for the best protection against flooding, a window well should be custom fit and made of steel-reinforced polycarbonate plastic
    - Floodproof Windows: Permanent glass protection can prevent flood damage from flooding and other extreme weather events. Floodproof windows or those with glass protection are passive systems that protect from rising flood water and debris impact.
    - Basement Window Protection: Fixed, translucent, water-tight covers installed on near grade or below grade basement windows provide increased protection against surface flooding.
- Egress Protection
    - Permanent doorway flood gate or panel: Permanent doorway flood gates or panels are physical barriers that attach to external doorframe and are always deployed to prevent floodwaters from entering a structure. They are opened and closed as entry is required to the building.
    - Passive flood gates: Passive flood gates will automatically deploy during flooding events to protect the entry point. These do not require electricity nor an external person to activate the system.
- Building Structure Protection
    - Protective barriers/walls: Although not common in urban residential areas, cinder block or similar materials formed into protective flood wall or similar barrier can prevent the intrusion of flood waters; especially for properties with subgrade, walk down basements.
    - Concrete Sealer: These products may be oil- or water-based, and they are heavier than conventional sealers and paints because they contain additives developed to create impermeable water barriers. Waterproofing compounds such as polyurethane and thick rubberized liquids one can brush, roll, dip and pour and can be applied to interior concrete surfaces to decrease their water absorbency.
    - Impermeable (water resistant) material around foundation: These materials can include waterproof boards and rubber seals. Excavation surrounding a property's foundation is likely required to install impermeable linings
    - Construct with Flood Resistant Building Materials: Flood Resistant building materials are defined by FEMA as any building product [material, component or system] capable of withstanding direct and prolonged contact with floodwaters without sustaining significant damage. The term "prolonged contact" means at least 72 hours, and the term "significant damage" means any damage requiring more than cosmetic repair. Flood resistant building materials include cement board, vinyl and rubber flooring, concrete, lime plaster and decay-resistant wood.
    - French Drains arounds Basement: The purpose of a French drain is to direct surface run off water and groundwater away from the home's foundation. These types of drains are ideal because they reduce pressure and remove excess moisture from the soil by collecting surface water and groundwater.
- Utility Protection
    - Elevate exterior utilities and service equipment: For external utilities such as heat pumps and Heating, Ventilation, and Air Conditioning (HVAC) elevate with cement blocks to an elevation outside of the floodplain.

Initial discussions have highlighted that to receive any potential SWU fee credit, the measures put in place would need to be permanent, maintained to retain their respective flood proofing integrity, be installed in accordance with City Code, and be verified on a schedule to be determined through the SWU Credit Program application process. Each of the practices listed may be considered a permanent floodproofing measure that either meets the definition of a dry floodproofing practice or constitutes a significant component of such practices.

Virginia Enabling Code

The question addressed is the viability of incorporation of the dry floodproofing mitigation menu provided above from the standpoint of state enabling code. Existing Virginia Code §15.2-2114 provides localities the opportunity to establish a SWU. Of note, municipal SWU's in Virginia are authorized to allocate resources and provide credits for both stormwater quality and stormwater quantity management practices. Virginia Code §15.2-2114 A. outlines what a SWU may spend or recover costs for, including both administration expenses and stormwater system components associated with managing Stormwater quantity, as follows:

> 1. The acquisition, as permitted by §15.2-1800, of real and personal property, and interest therein, necessary to construct, *operate and maintain stormwater control facilities;*
> 2. The cost of *administration of such programs;*
> 3. Planning, design, engineering, construction, and debt retirement for new facilities and enlargement or improvement of existing facilities, including the enlargement or improvement of *dams, levees, floodwalls, and pump stations, whether publicly or privately owned, that serve to control stormwater;*
> 4. Facility *operation and maintenance, including the maintenance of dams, levees, floodwalls, and pump stations, whether publicly or privately owned, that serve to control stormwater;*

As the components listed above include stormwater quantity management, Virginia Code §15.2-2114 E. which is mirrored in City Code Sec. 5-6-235 (a), provides the terms under which a locality with a SWU may provide full or partial waiver of charges from the SWU, as follows:

> A locality adopting such a system may *provide for full or partial waivers of charges to public or private entities that implement or participate in strategies, techniques, or programs that reduce stormwater flow or pollutant loadings,* ***or decrease the cost of maintaining or operating the public stormwater management system***. [emphasis added]

The above phrase in City Code Sec. 5-6-235 (a) provides a measure of flexibility to the municipal SWU to define potential fee waivers (SWU credits) that help "***decrease the cost of maintaining or operating the public stormwater management system***." The rationale explored for including dry floodproofing practices implemented to protect private properties to meet this component of the Code's intent includes:

- Decreases the cost of maintaining or operating the public stormwater management system: Dry floodproofing practices may reduce the amount of flood-borne debris that must be removed from the City's storm sewer system during and after a flooding event, thus reducing the City's burden during storm cleanup efforts post-flood;
- Decreases the cost of maintaining or operating the public stormwater management system: Allows the opportunity to reprioritize CIP project funds to a larger CIP project to protect the greatest number of ratepayers;
- Reduce administration of the program: Dry floodproofing measures may reduce the number of either complaint calls or emergency service calls the City receives during or after a flood event, potentially reducing the City's administrative burden in responding to these events; and

- Reduce pollutant loadings: By implementing dry floodproofing measures, flood waters would not have the ability to enter properties, where they can potentially pick up additional pollutant sources from building interiors and deliver them to the City's storm sewer system and waterways. Preventing the introduction of additional, potential contaminants should, in turn, reduce the pollutant loads delivered downstream during a flood event.

T&ES is currently evaluating the potential credit amounts or percentages for the menu of potential dry floodproofing practices discussed herein, with an eye towards keeping available credits in line with those already available for other stormwater management best management practices (BMPs) and activities currently approved in the City's SWU Fee Credit program.

Appendix B. Application Forms

RESIDENTIAL PROPERTIES

CONDO ASSOCIATION PROPERTIES

NON-RESIDENTIAL PROPERTIES

City of Alexandria, Virginia
Transportation & Environmental Services
Stormwater Utility Fee Credit Application: Residential Properties

I.	**Applicant Information**	
Property Address	Click or tap here to enter text.	
Account Number	Click or tap here to enter text.	Lookup at realestate.alexandriava.gov.
Owner / Applicant Name	Click or tap here to enter text.	
Phone Number	Click or tap here to enter text.	
E-Mail Address	Click or tap here to enter text.	

Is this an application to **renew an existing, unchanged SWU Fee Credit**? ☐ **Yes** ☐ **No**

II. What do you do to reduce stormwater runoff, improve its quality, or prevent flooding? Check all that apply. For more information, including credit values for each activity/practice and calculation examples, please see Section 6 of the SWU Fee Credit Manual.

☐ I maintain a **Stormwater Facility(ies)** on my property.

☐ I engaged in **Landscaping Practices** on the subject property.

☐ I installed and operated **Dry Floodproofing Practices** on the subject property.

II.1 Stormwater Practices, check all that apply:

Check all that apply:

☐ Rain Barrels (5-20%) / Enter the Number of Rain Barrels Installed: Click or tap here to enter text.

☐ Cistern (20%)	☐ Flow Thru Planter Box (20%)
☐ Detention Practices (20%)	☐ Permeable Pavement (20%)
☐ Dry Well / Infiltration (20%)	☐ Vegetated Green Roof (20%)
☐ Rain Garden (20%)	☐ Additional Stormwater Quality Practices (20%)

II.2 Landscaping Practices

☐ I pledge to maintain a dense cover of turf or conservation landscaping without the use of chemical fertilizers for two (2) years. (10%)

☐ I have installed conservation landscaping, as defined in Section 6 of the SWU Fee Credit Manual. (10%)

	Native Tree Species	New Tree Planting (up to 30%) / Mature Tree Preserved (up to 20%)	Tree Caliper Dimensions (min ≥1", New; ≥ 12", Mature)
Tree #1	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Tree #2	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Tree #3	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

Property Address	Click or tap here to enter text.
Account Number	Click or tap here to enter text.

II.3 Dry Floodproofing Practices, check all that apply:

☐ Protective Barrier/Wall(s) (10%)	☐ Ground Floor / Basement Custom Window Wells (10%)
☐ Permanent Doorway Flood Gate or Panel (10%)	☐ French Drain Around Basement (10%)
☐ Impermeable Material Barrier at Foundation (10%)	☐ Elevate Exterior Utilities / Service Equipment (5%)
☐ Passive Flood Gates (10%)	☐ Concrete Sealer (5%)
☐ Floodproof Windows (10%)	☐ Construct with Flood Resistant Building Materials (5%)
☐ Basement Window Protection (10%)	

III. Documentation and Applicant Signature

By submitting this New SWU Fee Credit Application, I certify that I have provided the documentation required for each creditable practice/activity applied for in this application as described in the SWU Fee Credit Manual. In addition, I certify the information provided is true, accurate, and complete to the best of my knowledge and belief.

Signature: Click or tap here to enter text. Date: Click or tap here to enter text.

Mail completed Application and Documentation to:
2900-B Business Center Dr,
Alexandria, VA 22314

Or e-mail Application and Documentation to:
stormwater@alexandriava.gov

City of Alexandria, Virginia
Transportation & Environmental Services
Stormwater Utility Fee Credit Application: Condo Association Properties

I.	Applicant Information	
Property Address	Click or tap here to enter text.	
Account Number	Click or tap here to enter text.	Lookup at realestate.alexandriava.gov.
Owner / Applicant Name	Click or tap here to enter text.	
Phone Number	Click or tap here to enter text.	
E-Mail Address	Click or tap here to enter text.	

Is this an application to **renew an existing, unchanged SWU Fee Credit**? ☐ **Yes** ☐ **No**

II. What do you do to reduce stormwater runoff, improve its quality, or prevent flooding? Check all that apply. For more information, including credit values for each activity/practice and calculation examples, please see Section 7 of the SWU Fee Credit Manual.

☐ We maintain a **Stormwater Facility(ies)** on my property.

☐ We engaged in **Landscaping Practices** on the subject property.

☐ We installed and operated **Dry Floodproofing Practices** on the subject property.

II.1 Stormwater Practices, check all that apply

☐ Detention Practices (up to 20%)	☐ Rainwater Harvesting (up to 20%)
☐ Infiltration Practices (20%)	☐ Rooftop/Impervious Area Disconnection (up to 20%)
☐ Bio Retention Facility (up to 20%)	☐ Vegetated Green Roof (up to 20%)
☐ Dry Swale (up to 20%)	☐ Sheet Flow to Veg. Filter Strip or Cons. Open Space (up to 20%)
☐ Wet Swale (up to 20%)	☐ Vegetated Green Roof (up to 20%)
☐ Grass Channel (up to 20%)	☐ Additional Stormwater Quality Practices (up to 20%)
☐ Permeable Pavement (up to 20%)	

II.2 Landscaping Practices

Urban Nutrient Management Plan: (up to 10%) Enter total parcel area (ft²) covered by Plan: Click or tap here to enter text.

	Native Tree Species	New Tree Planting (up to 30%) / Mature Tree Preserved (up to 20%)	Tree Caliper Dimensions (min ≥1", New; ≥ 12", Mature)
Tree #1	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Tree #2	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Tree #3	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

City of Alexandria, Virginia
Transportation & Environmental Services
Stormwater Utility Fee Credit Application: Condo Association Properties

Property Address	Click or tap here to enter text.
Account Number	Click or tap here to enter text.

II.3 Dry Floodproofing Practices, check all that apply:

☐ Protective Barrier/Wall(s) (10%)	☐ Ground Floor / Basement Custom Window Wells (10%)
☐ Permanent Doorway Flood Gate or Panel (10%)	☐ French Drain Around Basement (10%)
☐ Impermeable Material Barrier at Foundation (10%)	☐ Elevate Exterior Utilities / Service Equipment (5%)
☐ Passive Flood Gates (10%)	☐ Concrete Sealer (5%)
☐ Floodproof Windows (10%)	☐ Construct with Flood Resistant Building Materials (5%)
☐ Basement Window Protection (10%)	

III. Documentation and Applicant Signature

By submitting this New SWU Fee Credit Application, I certify that I have provided the documentation required for each creditable practice/activity applied for in this application as described in the SWU Fee Credit Manual including a picture. In addition, I certify the information provided is true, accurate, and complete to the best of my knowledge and belief.

Signature: Click or tap here to enter text. Date: Click or tap here to enter text.

Mail completed Application and Documentation to:
2900-B Business Center Dr,
Alexandria, VA 22314

Or e-mail Application and Documentation to:
stormwater@alexandriava.gov

City of Alexandria, Virginia
Transportation & Environmental Services
Stormwater Utility Fee Credit Application: Non-Residential Properties

I. Applicant Information		
Property Address	Click or tap here to enter text.	
Account Number	Click or tap here to enter text.	Lookup at realestate.alexandriava.gov.
Owner / Applicant Name	Click or tap here to enter text.	
Phone Number	Click or tap here to enter text.	
E-Mail Address	Click or tap here to enter text.	

Is this an application to **renew an existing, unchanged SWU Fee Credit**? ☐ Yes ☐ No

II. What do you do to reduce stormwater runoff, improve its quality, or prevent flooding? Check all that apply. For more information, including credit values for each activity/practice and calculation examples, please see Section 8 of the SWU Fee Credit Manual.

☐ I/We maintain a **Stormwater Facility(ies)** on my property.
☐ I/We engaged in **Landscaping Practices** on the subject property.
☐ I/We installed and operated **Dry Floodproofing Practices** on the subject property.
☐ I/We participated in a **Volunteer Activities** program.

II.1 Stormwater Practices, check all that apply:

☐ Detention Practices (up to 20%)	☐ Rainwater Harvesting (up to 20%)
☐ Infiltration Practices (20%)	☐ Rooftop/Impervious Area Disconnection (up to 20%)
☐ Bio Retention Facility (up to 20%)	☐ Vegetated Green Roof (up to 20%)
☐ Dry Swale (up to 20%)	☐ Sheet Flow to Veg. Filter Strip or Cons. Open Space (up to 20%)
☐ Wet Swale (up to 20%)	☐ Vegetated Green Roof (up to 20%)
☐ Grass Channel (up to 20%)	☐ Additional Stormwater Quality Practices (up to 20%)
☐ Permeable Pavement (up to 20%)	

II.2 Landscaping Practices

Urban Nutrient Management Plan (up to 10%): Enter total parcel area (ft²) covered by Plan: Click or tap here to enter text.

	Native Tree Species	New Tree Planting (up to 30%) / Mature Tree Preserved (up to 20%)	Tree Caliper Dimensions (min ≥1", New; ≥ 12", Mature)
Tree #1	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Tree #2	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Tree #3	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

City of Alexandria, Virginia
Transportation & Environmental Services
Stormwater Utility Fee Credit Application: Non-Residential Properties

Property Address	Click or tap here to enter text.
Account Number	Click or tap here to enter text.

II.3 Dry Floodproofing Practices, check all that apply:

☐ Protective Barrier/Wall(s) (10%)	☐ Ground Floor / Basement Custom Window Wells (10%)
☐ Permanent Doorway Flood Gate or Panel (10%)	☐ French Drain Around Basement (10%)
☐ Impermeable Material Barrier at Foundation (10%)	☐ Elevate Exterior Utilities / Service Equipment (5%)
☐ Passive Flood Gates (10%)	☐ Concrete Sealer (5%)
☐ Floodproof Windows (10%)	☐ Construct with Flood Resistant Building Materials (5%)
☐ Basement Window Protection (10%)	

II.4 Volunteer Activities

Prior registration is required. Contact stormwater@alexandriava.gov if you are interested in 1) starting a new registration; 2) continuing an existing registration; or 3) restarting a lapsed registration. Please provide contact information below.

	Number of Volunteers	Duration (Hours)	Estimated pounds of bulk trash
Event #1			
Event #2			
Event #3			
Event #4			

Check if you are renewing: ☐ Adopt-A-Waterway; ☐ Adopt-A-Block; ☐ Adopt-A-Storm Drain

Group Name	Click or tap here to enter text.
Group Contact	Click or tap here to enter text.
Group Contact Phone	Click or tap here to enter text.
Group Contact email	Click or tap here to enter text.

III. Documentation and Applicant Signature

By submitting this New SWU Fee Credit Application, I certify that I have provided the documentation required for each creditable practice/activity applied for in this application as described in the SWU Fee Credit Manual including a picture. In addition, I certify the information provided is true, accurate, and complete to the best of my knowledge and belief.

Signature: Click or tap here to enter text. Date: Click or tap here to enter text.

Mail completed Application and Documentation to:
2900-B Business Center Dr,
Alexandria, VA 22314

Or e-mail Application and Documentation to:
stormwater@alexandriava.gov

Rev. 10/2022

Appendix C. Stormwater Maintenance Agreement

STORMWATER MANAGEMENT / BMP FACILITIES OPERATION AND MAINTENANCE AGREEMENT

THIS AGREEMENT, made and entered into this ___ day of _____, 20__, by and between,_____ hereinafter called the "Landowner", and the City of Alexandria, Virginia (the "City");

WITNESSTH:

WHEREAS, the Landowner is the owner of certain real property described as tax map #_____, block #_____, parcel(s) #_____ as acquired by deed in the land records of the City of Alexandria, Virginia, Deed book _____ Page # _____ (Instrument #_____,) hereinafter called the "Property".

WHEREAS, the Landowner is proceeding to build on and develop the property; and

WHEREAS, Type project name _____, Type project number _____, hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be approved by the City, provides for detention and/or on-site treatment of stormwater within the confines of the property; and

WHEREAS, the City and the Landowner, its successors and assigns agree that the health, safety and welfare of the residents of the City of Alexandria, Virginia, require that on-site stormwater management/Best Management Practices (BMP) facilities be constructed and maintained on the property; and

WHEREAS, the City requires that on-site stormwater management/BMP facilities as shown on the Plan be constructed and adequately maintained by the Landowner, its successors and assigns.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management/BMP facilities shall be constructed by the Landowner, its successors and assigns, in accordance with the plans and specifications identified in the plans.

2. The Landowner, its successors and assigns, shall maintain the stormwater management/BMP facilities in good working conditions, acceptable to the City, so that they are performing their design functions.

3. The Landowner, its successors and assigns, hereby grant permission to the City, its authorized agents and employees, to enter upon the property and to inspect the stormwater management/BMP facilities whenever the City deems necessary. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facility including, berms, inlet and outlet structures, vegetation, infiltration media, pond areas, access roads, etc. When deficiencies are noted, the City shall notify the Landowner, its successors or assigns, and provide information about the inspection findings and evaluations.

4. The Landowner shall develop and attach to this "STORMWATER MANAGEMENT / BMP FACILITIES OPERATION AND MAINTENANCE AGREEMENT" a "BMP MAINTENANCE SCHEDULE AND GUIDELINE" that has been reviewed and approved by the City or its designee. This BMP Maintenance Schedule and Guideline shall describe the maintenance practices to be performed for the facilities and include a maintenance schedule for implementation of these practices.

5. In the event the Landowner, its successors and assigns, fail to maintain the stormwater management/BMP facilities in good working condition acceptable to the City, the City may enter upon the Property and take whatever steps it deems necessary to maintain said stormwater management/BMP facilities and to charge the costs of the repairs to the Landowner, its successors and assigns. This provision shall not be construed to allow the City of Alexandria to erect any structure of a permanent nature on the land of the Landowner, outside of an easement belonging to the City. It is expressly understood and agreed that the City is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the City.

6. The Landowner, its successors and assigns, will perform maintenance in accordance with the maintenance schedule and guidelines for the stormwater management/BMP facilities, including sediment removal, as outlined on the approved plans and the following specific requirements:

Maintenance of the following Best Management Practice(s):

Insert number and type of each BMP here

shall conform to the requirements contained in the Virginia Stormwater BMP Clearinghouse, the attached maintenance schedule and guidelines, and/or specific maintenance requirements established by the BMP manufacturer as approved by the Director of Transportation and Environmental Services (T&ES) prior to the release of the Final Site Plan. Specific manufacturer maintenance requirements for proprietary BMPs will be submitted to the City of Alexandria, T&ES.

7. In the event the City, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials and the like on account of the Landowner's or its successors' and assigns' failure to perform such work, the Landowner, its successors and assigns, shall reimburse the City, upon demand, within 30 days of receipt thereof for all costs incurred by the City hereunder. If not paid within such 30-day period, the City shall have a lien against the property in the amount of such costs, plus interest at the Judgment Rate, and may enforce it in the same manner a lien for real property taxes may be enforced.

8. The Landowner, its successors and assigns, shall indemnify and hold harmless the City and its agents and employees for any and all damages, accidents, casualties, occurrences or claims which might arise or be asserted against the City for the construction, presence, existence or maintenance of the stormwater management/BMP facilities by the Landowner, its successors and assigns.

9. In the event a claim is asserted against the City, its agents or employees, the City shall promptly notify the Landowners, their successors and assigns, and they shall defend, at their own expense, any suit based on such claim. If any judgment or claim against the City, its agents or employees shall be allowed, the Landowner, its successors and assigns shall pay all costs and expenses in connection therewith.

10. The Landowner, its successors and assigns, hereby grants permission to the city, its authorized agents, employees, guests, and consultants to enter upon the property to install, operate and maintain equipment to monitor the flow characteristics and pollutant content of the influent and effluent, and at intermediate points in the facility. The Landowner further agrees to design and construct the facility to provide access for monitoring as outlined in the Virginia Stormwater BMP Clearinghouse and/or in the manufacturer’s manual for the BMP.

11. The Landowner, its successors and assigns, hereby grants permission to the City, its authorized agents, employees and guests to enter upon the property whenever the City deems necessary, with a ten day advance notice, to conduct tours of the stormwater management/BMP facilities. The purpose of such tours is to expand the base of knowledge in the stormwater management/BMP field amongst planners, engineers, scientists and other interested parties.

12. This Agreement shall be recorded among the land records of the City of Alexandria, Virginia, and shall constitute a covenant running with the land/or equitable servitude, and shall be binding on the Landowner, its administrators, executors, assigns, heirs and other successors in interest.

WITNESS the following signatures and seals:

_____
Landowner Signature

_____
Print or Type Name

_____
Title

ATTEST:

_____

COMMONWEALTH OF _____

CITY OF _____

I, _____, a Notary Public in and for the City and Commonwealth aforesaid, whose commission expires on the ____ day of _____, 20__, do hereby certify that _____, whose name(s) is/are signed to the foregoing Agreement bearing date of the _____ day of _____, 20__, has acknowledged the same before me in my said City and State.

GIVEN UNDER MY HAND THIS _____day of _____, 20____.

_____
NOTARY PUBLIC

WITNESS the following signatures and seals.

_____
Director, Department of T&ES or Designee

_____
Print or Type Name

ATTEST:

_____

COMMONWEALTH OF _____
CITY OF _____

I, _____, a Notary Public in the City of Alexandria and for the Commonwealth of Virginia, whose commission expires on the _____ day of _____, 20 _, do hereby certify that _____, representative for the City of Alexandria, whose name is signed to the foregoing Agreement bearing the date of the ____ day of _____, 20__, has acknowledged the same before me in the City and Commonwealth aforesaid.

GIVEN UNDER MY HAND THIS _____ day of _____, 20_____.

_____
NOTARY PUBLIC

Appendix D. Resources

USEFUL LINKS FOR STORMWATER UTILITY CREDITS

City-Recognized Design Standards

Virginia Stormwater BMP Clearinghouse is a website at www.swbmp.vwrrc.vt.edu with the main purpose of sharing information on the design standards and specifications for stormwater BMPs approved for use in Virginia.

All BMPs must meet City-recognized Design and Construction Standards to be eligible for credit. Since the BMP Clearinghouse standards are written for professionals, the City may choose to recognize alternative design standards for practices on the residential properties credit menu, such as the Chesapeake Stormwater Network's 2014 *Homeowner Guide for a More Bay-Friendly Property*. Contact us for up-to-date information on what standards are accepted.

ADDITIONAL RESOURCES

Plant NOVA Natives is a joint marketing campaign of a grand coalition of non-profit, governmental, and private groups, including Alexandria, all working to reverse the decline of native plants and wildlife in Northern Virginia. Their guide *Native Plants for Northern Virginia* is available for free online as a pdf at www.plantnovanatives.org.

Digital Atlas of the Virginia Flora contains the most comprehensive information available on the geographic distribution of vascular plants in the Commonwealth. It includes native and well-established non-native plants and is a great source for determining whether a plant is native to Virginia. Visit vaplantatlas.org to explore the atlas.

Qualified Professionals must certify the proper functioning of Condition of Development Stormwater Facilities and Green Infrastructure BMPs on Condominium and Non-Residential Properties. While the City cannot endorse specific firms, most engineering firms with civil or environmental professionals or architecture or landscape architecture firms should be able to provide these services. To find an individual with a qualifying Stormwater Management Inspector certification from the Virginia Department of Environmental Quality, visit www.deq.virginia.gov/permits-regulations/training-certification and follow the link for the Certified Users Search Tool.

Urban Nutrient Management. The Virginia Department of Conservation and Recreation maintains a directory of private-sector certified planners (PDF) who develop nutrient management plans for a variety of turf grass and landscape management situations. Access the directory online at www.dcr.virginia.gov/soil-and-water/urban-nutmgt.

Visit alexandriava.gov/Stormwater for even more resources including information on upcoming workshops offered, jointly through the Northern Virginia Clean Water Partners and information on the Virginia Conservation Assistance Program, offered jointly through the Northern Virginia Soil and Water Conservation District.

Appendix E. Glossary

Best Management Practice (BMP): A schedule of activities, prohibitions of practices, maintenance procedures, and other management practices, including both condition of development and voluntary practices, to prevent or reduce the pollution of surface water and groundwater systems.

Condition of Development: A BMP that is required during development or redevelopment. These BMPs are required to be inspected every 5 years. Inspecting every application cycle is required is applying for a SWU Credit.

Equivalent Residential Unit (ERU): the average amount of impervious surface on a single family residential property in the City. The ERU is calculated to be 2,062 square feet of impervious area and is equal to one billing unit.

Impervious Area: A surface composed of any material that significantly impedes or prevents natural infiltration of water into the soil. Impervious surfaces include, but are not limited to roofs, buildings, streets, parking areas, and any concrete, asphalt, or compacted gravel surfaces.

Inspection: An on-site review of compliance with a city permit, the city's stormwater management program, and any applicable design criteria, or an on-site review to obtain information or conduct surveys or investigations necessary in the enforcement of the Stormwater Utility Ordinance.

Non-Residential Property: All properties not considered residential (as defined below), such as commercial or industrial properties, apartment buildings, and non-profit or faith-based properties. Owner or Property Owner: The owner or owners of the freehold of the premises or lesser estate therein, a mortgagee or vendee in possession, assignee of rents, receiver, executor, trustee, lessee or other person, firm, or corporation in control of a property.

Residential Property: Residential condominiums, townhouses, and detached single family homes.

Stormwater: Precipitation that is discharged across the land and impervious surface or through conveyances to one or more waterways and that may include stormwater runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Maintenance Agreement: A legally recorded document that acts as a property deed restriction, and which provides for the long-term maintenance of stormwater management practices.

Stormwater Management Facility: A physical control measure that controls stormwater runoff and changes the characteristics of that runoff including, but not limited to, the quantity and quality, the period of release, or the velocity of flow. A stormwater management facility is a type of best management practice.

Stormwater Quality BMP: A BMP that treats stormwater runoff from an impervious surface by affecting the chemical, physical, and/or biological characteristics of stormwater runoff.

Stormwater Utility Fee: A stable, equitable source of funding for the City's Stormwater Management Program that will be used to meet State and Federal stormwater mandates, provide dedicated funding to meet pollution mandates, operate and maintain the stormwater infrastructure, and maintain the City's flood infrastructure and flood management program. All property owners in the City contributing to stormwater runoff, including businesses, home owners, state and federal government, and non-profit organizations are subject to the fee.

Stormwater Utility (SWU) Fee Credit: Full or partial reduction of Stormwater Utility Fees granted to a property owner who manages stormwater to achieve a permanent reduction in stormwater flow or pollutant loadings as defined by City Code § 5-6-235.

CITY OF ALEXANDRIA VIRGINIA

ECO-CITY ALEXANDRIA
CLEAN WATERWAYS