



August 26, 2013

Radnor Township Board of Commissioners
301 Iven Avenue
Wayne, PA 19087

Commissioners:

I write to offer comments on proposed Ordinance No. 2013-15, titled *An Ordinance of the Township of Radnor, Delaware County, Pennsylvania, Establishing a User Fee for Stormwater Collection and Management*.

The concept included in the proposed ordinance of collecting fees in order to address stormwater issues in Radnor Township is a fine idea, but there are a number of deficiencies in the draft ordinance that should be remedied before it moves to final vote. As currently written, this ordinance could prevent the use of collected fees for projects that avoid stormwater runoff, that directly address the harms it has or will inflict, and that ensure equity between residential property owners and commercial/institutional property owners.

The draft ordinance “Whereas” clauses and “Statement of Findings” fail to reference Pennsylvania’s Stormwater Manual that provides important guidance.

In an oversight that should be remedied, the ordinance “Whereas” clauses and Statement of Findings fails to reference the Pennsylvania Stormwater BMP Manual. Pennsylvania’s Stormwater Manual provides important guidance for how the township should be addressing stormwater runoff quantity, quality, recharge, flows, and the ramifications thereof. The Manual prioritizes the value of stormwater avoidance and recharge for addressing quality and quantity issues, and highlights a variety of avoidance, infiltration and mitigation strategies that can be used by Radnor Township and should be given high priority consideration in the use of the Stormwater User Fees collected. Failure to reference the Manual fails to ensure Radnor Township will properly comply with its guidance in the use of the User Fees collected pursuant to the draft ordinance. The Whereas clauses and Statement of Findings should be modified to include reference to Pennsylvania’s Stormwater Manual.

Possible Whereas clauses include the following:

Whereas, “The purpose of the Pennsylvania Stormwater Best Management Practices (BMP) Manual is to provide guidance, options and tools that can be used to protect water quality, enhance water availability and reduce flooding potential through effective stormwater management,” and to provide guidance to help meet state and federal requirements regarding stormwater;

Whereas, the Pennsylvania Stormwater Best Management Practices (BMP) Manual strongly encourages stormwater management practices that first prevent stormwater runoff, and second mitigate runoff; and

Whereas, the Pennsylvania Stormwater Best Management Practices (BMP) Manual makes clear: “Controlling the peak rate of flow during extreme rainfall events is important, but it is not sufficient to protect the quality and integrity of Pennsylvania streams. Reducing the overall volume of runoff during large and small rainfall events, improving water quality, and maintaining groundwater recharge for wells and stream flow are all vital elements of protecting and improving the quality of Pennsylvania’s streams and waterways”.

The Statement of Findings should be similarly edited to include reference to the Manual and the stormwater strategies, goals, and priorities referenced therein.

Including these provisions will support Radnor’s legal authority in passing this ordinance, and will provide additional appropriate guidance for how the funds raised by the User Fee should be appropriately invested as well as identifying appropriate opportunities for the credits program proposed.

Additionally, considering that a primary discussed goal of the User Fee initiative is to address flooding and flood damages in the Township, the exercise of your police power in order to achieve these health and safety goals should be more strongly represented in your Whereas clauses. For example, there should be a clause along the lines of:

Whereas, flooding and flood damages, including during the smaller storms, is becoming an increasing health and safety problem for Radnor’s residents, for the protection of water quality, for preventing erosion that undermines infrastructure, and for the delivery of emergency services.

The ordinance “Statement of Findings” fails to reference taxpayer funded studies fully available and applicable addressing stormwater issues in Radnor Township.

Section 2 of the Statement of Findings, only references the AMEC work and that of Chagrin Valley, yet it was relatively recently that the Township invested in and secured some very important engineering findings and studies on the issue of stormwater runoff from Cahill Associates; this body of work should also be referenced in the ordinance. The Township invested considerably in securing these additional studies, and it is a disservice to the taxpayers who funded them not to include them in this ordinance.

The draft ordinance Statement of Findings fails to properly reference concerns about the increasing volume of stormwater runoff that is resulting in increased and more frequent flooding, flood damages, erosion and other problems, and fails to highlight the importance of recharge for drinking water.

As written, Section 2, Paragraphs B, C and D should be modified as they fail to include important areas of consideration and focus and make some characterizations that are not altogether accurate. For example:

- ✓ These provisions fail to directly reference the importance of stormwater recharge for protecting drinking water supplies; there are Township residents who have water wells and are directly impacted by a failure to infiltrate and by the increased volume of stormwater runoff;
- ✓ These provisions fail to focus on the increase in runoff volume which is a primary cause of increased flooding, and they fail to focus on the goals of reducing flood damages -- including flooding of properties and roads and the erosion of public and private lands -- caused by increased runoff and resulting stream flows;
- ✓ Paragraph B asserts that inadequate management of stormwater undermines floodplain management, when actually it is the inadequate management of floodplains that undermines stormwater management.

Suggested edited versions of paragraphs B and C are as follows:

- B. Inadequate management of the quantity and quality of stormwater runoff throughout a watershed increases flood flows and velocities, contributes to erosion of public and private lands, increases sedimentation thus altering stream flow paths and degrading water quality, overtaxes the carrying capacity of existing streams and stormwater sewers, increases the cost of public facilities to convey and manage stormwater, undermines flood damage reduction efforts in upstream and downstream communities, reduces groundwater recharge, and threatens public health and safety.
- C. Inadequate planning and management of stormwater runoff throughout a watershed can harm surface water resources by changing natural hydrologic patterns, including: increasing instream flow volumes resulting in greater flood peaks, more frequent flood events, and increased flood damages; and accelerating stream flows which contributes to increased peak flows and volumes downstream, increasing scour and erosion of stream beds and stream banks, destroying aquatic habitat and elevating aquatic pollutant concentrations and loadings such as sediments, nutrients, heavy metals and pathogens. Groundwater resources are also impacted through loss of recharge. Stormwater is an important water resource which provides groundwater recharge for drinking water wells, water supplies and baseflow of streams -- which also protects and maintains surface water quality.

Paragraph D places its emphasis on controlling flooding, erosion and pollution rather than seeking to avoid and minimize them. There is quite a difference in focusing on control versus avoidance and minimization. It is important the Township ordinance is properly focused and oriented on such matters; therefore, I would recommend that the term "control" be replaced with "avoid and minimize."

In the ordinance, single family residential properties are charged differently based on property size. This same obligation should apply to commercial, private recreational, institutional and industrial properties; charging these facilities for impervious area only while excluding lawns from its definition discounts a major source of stormwater runoff that is contributing significantly to flooding, pollution, erosion and flood damage problems in the Township.

The way the user fee is proposed, single family residential properties with larger lots are being subject to a larger fee for the additional stormwater they generate under typical private property management approaches as compared to smaller single family residences with less square footage. But commercial, private recreational, institutional and industrial properties are not similarly being billed for their increased runoff by virtue of holding a larger site generally managed as a lawn.

Large-scale lawns are scientifically demonstrated to be a major source of stormwater runoff. Lawns have been scientifically demonstrated to have a level of imperviousness that rivals pavement, and as such are the source of a nearly equivalent level of stormwater runoff. Therefore, the user fee charged to commercial, private recreational, institutional and industrial properties needs to encompass the vast areas of lawn that are a part of such facilities.

Presently under the draft ordinance, commercial, private recreational, institutional and industrial property owners are billed for only what is now defined as “impervious area,” a definition that expressly does NOT include lawns. This means that single family residences are being billed more for their larger properties, with assumed greater runoff, but commercial, private recreational, institutional and industrial properties are not. Even if the reason for the larger fee for larger single family residences is not based on a presumed larger lawn, but is instead based upon a presumed larger source of runoff due to the larger parcel size, the same rationale applies to commercial, private recreational, institutional and industrial properties. Even if a commercial, private recreational, institutional and industrial site is managed by a detention system, they are a larger contributor to runoff volume in the Township, as detention basins directly contribute their runoff volume to stream systems and in fact do so in a way that is extremely and demonstrably damaging.

Ways to ensure the increased runoff from the large lots and/or lawns associated with commercial, private recreational, institutional and industrial properties include:

- a) Since the user fee charged to these operations is based not upon lot size but upon square footage of impervious area, one way to address the issue is to modify the definition of impervious area in Section 3 of the draft ordinance to include “lawns/lawnscape”.



Photos of Radnor Valley Country Club during a rain event – top is water collecting off their massive lawn, below is the water being dumped to a storm drain that discharges it to a creek.



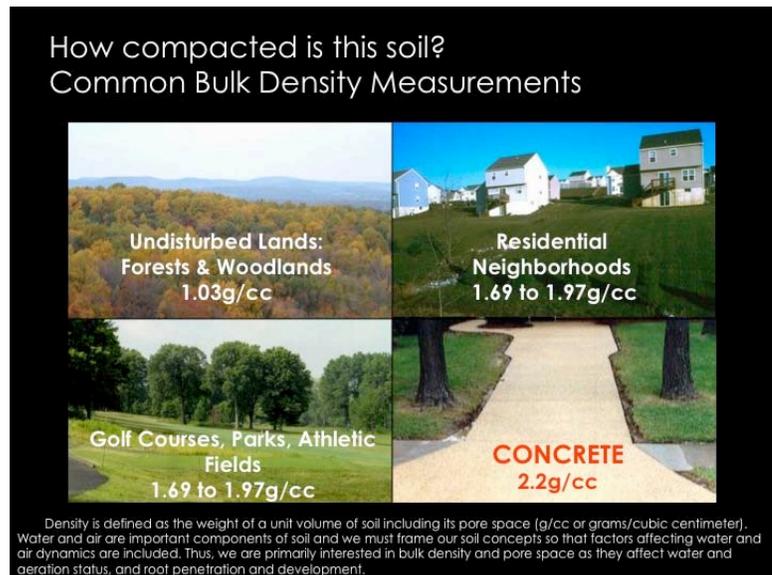
- b) Another approach is to subject non-single family residential parcels to a fee scale that is also based on lot size, as is done for single family residential parcels in the ordinance.
- c) Additionally, the large-scale lawnscapes issue can be addressed through the ordinance's credits program.

Some common practices in ordinances used by other communities to address this issue include:

- ✓ Defining "impervious surface: to include compacted surfaces and/or graded surfaces, as well as semi-impervious surfaces;
- ✓ Using a runoff coefficient for calculating the runoff from properties such as golf courses, parklands and cemeteries;
- ✓ Basing the calculation of fees for non-single family developed parcels on equivalent residential units which is a calculated size of property that gets applied to non-single family residential properties subject to the fee.

Lawns take up a large area in Radnor Township's commercial, private recreational, institutional and industrial properties. Lawns have been documented to be a significant source of runoff, preventing the infiltration of water in much the same way pavement does. By comparison, areas dominated by trees and shrubs successfully prevent runoff and encourage infiltration, and over time and space have a significant impact in preventing flooding and flood damages. The large-scale lawnscapes associated with commercial, private recreational, institutional and industrial properties often dwarf in scope and management that of residential communities.

Lawns are a significant source of stormwater runoff because they have very high imperviousness, often close to that of pavement. Lawns generate significantly more stormwater runoff than meadow, scrub vegetation or forests.ⁱ



"[M]any urban soils and surfaces have much higher bulk densities (Table 1). The highly disturbed soils of urban lawns range from 1.5 to 1.9 gms/cc, while athletic fields and fill soil typically range from 1.8 to 2.0 gms/cc. These bulk density values approach the density of concrete (2.2 gms/cc)."ⁱⁱ

In addition to increasing the success of the stormwater user fee program at securing practices that reduce and avoid runoff, it is important to capture the lawnscapes concept as a matter of equity between parcels maintained largely in forest, which prevent runoff, versus those maintained in lawn, which are actual contributors to the flooding problems of the Township. Including lawnscapes in the Stormwater user fee provides an important path for incentivizing

the revegetation of lawns, which can provide tremendous benefit in reducing the volume of stormwater runoff.

By way of demonstration of the stormwater value of trees:

- ✓ A loss of tree cover over a 15 year period (1985 to 2000) in Bucks, Montgomery, Delaware, and Chester Counties, Pennsylvania, and Mercer, Burlington, Camden and Gloucester Counties, New Jersey, reduced the ability of the Delaware River watershed region's urban forests to "detain almost 53 million cubic feet of stormwater, a service valued at \$105 million."ⁱⁱⁱ
- ✓ Existing tree cover was found to prevent 65 million cubic feet of stormwater runoff in the Big Timber Creek watershed (New Jersey), saving the community \$3.3 billion in stormwater infrastructure.^{iv}
- ✓ In the Cobbs Creek watershed (Pennsylvania), existing tree cover prevented 20 million cubic feet of stormwater runoff, saving the community \$1 billion in stormwater infrastructure.^v
- ✓ In the Mill Creek watershed (New Jersey), existing tree cover prevented 6.7 million cubic feet of stormwater runoff, saving the community \$350 million in stormwater infrastructure.^{vi}
- ✓ And, in the Frankford-Tacony watershed (Pennsylvania), existing tree cover prevented 38 million cubic feet of stormwater runoff, saving the community \$2 billion in stormwater infrastructure.^{vii}

Definition of Stormwater Sewerage System needs to be modified to include stormwater avoidance and infiltration practices to ensure that these approaches, which are currently emphasized in state and federal legal mandates and policies to which Radnor is subject, are given high priority for implementation and maintenance, and to ensure that the funds discussed in Section 13, i.e., the Stormwater Management Fund, can be spent on Township projects that prevent, avoid, reduce, minimize and/or infiltrate stormwater runoff before it can ever enter the stormwater system and need additional township management.

As it currently stands, the user fees collected as a result of this ordinance are to be used for "the system of collection and conveyance, including pipes, conduits, mains, inlets, culverts, catch basins, gutters, ditches, channels, detention ponds, streets, curbs, drains and all devices, appliances and facilities appurtenance therefor used for collecting, conducting, pumping, conveying, detaining and/or treating stormwater."

As such, the user fee collected by this program is focused on collecting, conveying, detaining and/or treating stormwater; the failure to include systems that avoid, minimize and/or infiltrate stormwater in all of this descriptive language arguably excludes them from the program.

As stated in Pennsylvania's Stormwater Best Management Practices Manual:

"Controlling the peak rate of flow during extreme rainfall events is important, but it is not sufficient to protect the quality and integrity of Pennsylvania streams. Reducing the overall volume of runoff during large and small rainfall events, improving water quality, and

maintaining groundwater recharge for wells and stream flow are all vital elements of protecting and improving the quality of Pennsylvania's streams and waterways."

As such, it is critical that Radnor includes emphasis on these strategies – i.e., reducing volume and improving infiltration -- in the implementation and use of its User Fee program for stormwater maintenance, management and improvement. As the language of the ordinance stands now, if there was a structural or nonstructural strategy that could be implemented in such a way as to prevent the creation of current or future stormwater runoff or there was an effort needed to address the harms of runoff, this ordinance would not allow the user fee to be used for its implementation.

- × Strategies for avoiding runoff, such as removing existing impervious cover and replacing it with pervious natural habitats;
- × stream restoration projects that restore the carrying capacity of streams and direct them on a natural flow path that avoids redirection into existing homes or infrastructure;
- × streambank restoration to address the erosion of public and private lands and/or the undermining of roads, bridges and other infrastructure;
- × and/or floodplain restoration projects to restore and enhance their ability to reduce flood peaks and flows

are all very arguably excluded from consideration for funding implementation by the current proposed ordinance.

In addition, the following projects included on the Township list of Capital Projects Backlog are similarly excluded from funding in total or part by the user fee with the way the ordinance is currently written:

- × Streambank stabilization – Gulf Creek Road;
- × Willow/Woodland Stream Channel Stabilization;
- × Portions of the Lancaster Avenue Green Infrastructure project;
- × Portions of the Wyldehaven Road Traffic Calming project.

While some might say such approaches are arguably included, my perspective as an advocate, attorney and resident is that there is much room for debate, so why allow the opportunity for the argument, and why have language that is focused on detention and conveyance rather than simply including language that makes clear that the fee can also be invested in strategies focused on avoidance, infiltration and nonstructural strategies that are known to reduce flood flows, peaks and damages and or will address the physical harms created by increased runoff volume, peaks and/or velocity.

Stormwater user fee programs commonly include this kind of broader language, for example including in the definition of the stormwater system/stormwater management system:

- ✓ "methods to ... absorb, inhibit, prevent or reduce flooding, ... environmental degradation and water pollution or otherwise affect the quality and quantity of discharge from such system." (City of Germantown Tennessee)
- ✓ "...retention ...basin, infiltration facilities and other components as well as all natural waterways." (City of Takoma Park, Maryland)
- ✓ "methods to ... absorb, inhibit, treat, use or reuse water to prevent or reduce flooding, overdrainage, environmental degradation, and water pollution, or otherwise affect the

quantity and quality of discharges from the system.” And includes in the definition of stormwater program strategies for addressing quantity and quality issues including “programs relating to water, floodplains, ... erosion, tree conservation, and sediment control.” (Crystal River, Florida)

The ordinance should include fee forgiveness for those residents for whom this fee is a genuine hardship. Fee forgiveness should also be included for Township-owned recreational facilities and for school properties that are owned and operated for the benefit of Township residents and for whom any user fee could ultimately be passed along to residents in the form of increased taxes or other charges.

I will reiterate the importance of making some modifications/enhancements to the basic fee structure.

I believe strongly that the program needs to include fee forgiveness for those residents that have limited incomes and for whom a fee would be a significant hardship. Section 10 B should be modified to allow for such a forgiveness or reduction in fees for hardship cases.

In addition, Township- and School District-owned properties should also be the subject of a fee forgiveness program, as any charges made for those properties ultimately comes out of the taxpayer pocket and so are likely to result in increased taxes or other resident charges in order to cover the costs. Better to just exclude these community parcels in the first instance.

The limitation of credits for onsite treatment of stormwater runoff is a gross oversight and should be remedied to include measures that avoid or infiltrate runoff thereby reducing the volume of stormwater runoff from a site, not just treating the quality of the water that runs off to make it less polluted.

Although Section 10 says that it applies for “onsite management,” the actual language of the provision says that it will provide credit for treatment of stormwater runoff. Treatment of runoff is generally understood to apply to the issue of water quality (i.e., level of pollution), as opposed to water quantity (i.e., the volume of runoff). As a result, the credits described in Section 10 can be interpreted to exclude efforts that reduce, avoid, or infiltrate runoff before it can leave the property and enter the stormwater system. This provision must be modified so it is clear that credits are given for efforts by property owners that reduce the volume of runoff from their site, either by preventing the creation of that runoff in the first instance (e.g., by transforming impervious surfaces to pervious surfaces), or by capturing runoff onsite and infiltrating it or using it in some way that prevents it from ever entering the stormwater system of the Township (e.g. collecting rainfall in rain barrels or capturing runoff in retention systems and using them, maintaining them, or infiltrating them onsite).

It is important that the ordinance makes clear that credits from the user fee can be given for volume reduction strategies as well as water quality enhancement. It is much more effective to prevent the volume of runoff (through avoidance or infiltration) than to continue to allow the volume of runoff and simply apply efforts to make that runoff a little cleaner. Further, strategies such as stream restoration, streambank restoration, and floodplain restoration are important stormwater strategies that should also be legitimate options for user fee credit by the express terms of the ordinance. Protecting and restoring streambanks and floodplains reduces flow volumes, peaks and velocities by providing areas for high flows storage and

increasing friction that can reduce velocity and resist erosion. Ensuring natural channel design strategies for ensuring natural flow patterns can prevent the redirection of a stream channel and therefore the direction of its flow volume so as to avoid causing new or increased flood damages downstream. Creation and/or protection of vegetated buffers dominated by native trees and shrubs can reduce flow volumes, peaks and prevent erosion that eats away public and private lands, can undermine infrastructure, and can prevent water pollution associated with stormwater runoff.

Criteria and Measurements of Success are Needed.

There needs to be added to the ordinance either specific criteria for selecting projects and measuring the success of projects funded and implemented or a directive that there be created a committee that will set such project selection criteria and mechanism for identifying and reporting on the results of projects undertaken. This information will inform fund and credit decisionmaking and also help evaluate the success of the project. It will also ensure objective criteria are put in place for selecting and analyzing projects and the success of the program.

The ordinance should include a mechanism for ensuring shared direct benefit from the implementation of the user fee program.

In order to ensure the program is embraced by all members of the Radnor Township community, it is important that everyone benefits from the program -- not just on a Township-wide level, but on a community level. Just as the ordinance ensures all members of the Township community are contributing to the Stormwater Management Fund, there should be some mechanism for ensuring each of the Township's watersheds and communities directly benefits from investing in the program. Of course, there are some projects that are demonstrably of direct benefit to all residents -- such as addressing the stormwater problems in front of the firehouse and at our schools -- but it is important that there is some demonstrable assurance that the funds will be distributed in their use around the Township -- maybe not in every given year, and maybe not in specific dollar amounts, but in some way. This could be based upon a certain percentage (large or small) being allocated for use in each of the Township's sub-watersheds (Little Darby/Darby Creek, Ithan Creek, Meadow Brook Run, Gulph Creek); some obligation that over a specified period of years each subwatershed community be the beneficiary of a project; or that there at least be identified for consideration projects in each of the sub-watersheds that the community could then advocate for when stormwater decisions are being made. Whatever the commitment, large or small, it could only be beneficial if every part of the community can experience a shared direct benefit from the program just as there is shared direct responsibility from/for this fund.

While the concept of a stormwater user fee is an appropriate opportunity for consideration by the Commissioners, the proposed ordinance as drafted fails to ensure that the program is equitably implemented and to ensure that funds generated will be used to best effect for the community.

Respectfully Submitted,



Maya K. van Rossum

ⁱ DNREC and Brandywine Conservancy, Conservation Design for Stormwater Management: A Design Approach to Reduce

ⁱⁱ The Compaction of Urban Soils, Technical Note #107 from Watershed Protection Techniques. 3(2):661-665.

ⁱⁱⁱ American Forests. 2003. *“Urban Ecosystem Analysis Delaware Valley Region: Calculating the Value of Nature.”* March 2003 (The value

attributed to these natural systems is based upon what it would have cost the region to construct basins and other solutions for intercepting the runoff.)

^{iv} Ibid.

^v Ibid.

^{vi} Ibid.

^{vii} Ibid.