Sustainable Water Resource Practices

This section is related to and shoudl be read in conjunction with the Land Use Element, and Conservation Element.

Implementing sustainable water resource practices will provide reliably clean water to serve the needs of the current residents of Lawrence Township without compromising the ability of future generations to meet their own needs. The conservation of water quantity and the preservation and enhancement of water quality should be a priority, as related to the water supply and all the beneficial uses of water resources within the community.

Nationally, the average amount of water used by each person is 100 gallons per day.[7] In New Jersey, lawn irrigation consumes nearly half of homeowner water usage![8] The goals for sustainable water resources practices must accommodate growth and redevelopment within the community and be integrated with land use and community planning. Drinking water in the Township, depending on location, is provided by either a public authority, Trenton Water Works, or by individual private wells.

The Lawrence Township Environmental Resource Inventory (ERI) was developed in March 2008 to document the natural and biological resources within the Township. The ERI states that *"Lawrence's surface waters and groundwater resources, and the terrestrial resources that sustain the area's hydrology, will become increasingly important to its population and that of neighboring communities as continuing development places increasing pressure on diminishing natural resources"*. There are areas of the State where the availability of water is limiting the scale and timing of development. In the northern part of the State known as the Highlands region, for example, the Highland Council was created and is now implementing development standards, most importantly intensity limits, aimed at maintaining water quantity and quality for this area which provides drinking water to approximately half of the State. It is therefore critical to for us to understand how our actions impact the water resources in the community and what goals, objectives, and strategies are necessary to sustain both the availability and quality of water. Knowledge and understanding of the Township's water resources should be promoted. Education is a critical component to encouraging property owners to use innovative stormwater management techniques and to reduce nonpoint source pollution.

The streams located in the central and southern portions of Lawrence Township drain to the Delaware River through the Assunpink Creek Watershed. The northern part of the Township drains to the Raritan River through the Stony Brook Watershed. A watershed is defined as the land area and surface water bodies, such as streams and lakes, which drain to these water bodies. Many factors, including land use, soils, vegetation, and human activity impact the water quality and ecological value of a watershed. According to the 2008 Integrated Water Quality Monitoring and Assessment Report, published by the New Jersey Department of Environmental Protection (NJDEP), impairments of the Township's waterways include aquatic life, dissolved oxygen, total phosphorus, e. coli, arsenic, lead, and mercury.

Wetlands and riparian areas are of particular importance to water quality. Wetlands are areas where water occurs at the soil surface for long enough periods to establish a certain biological and ecological community. These areas are known for their ability to filter pollutants and thereby improve water quality. Riparian areas are the land adjacent to surface waters that act as a buffer. When these areas contain vegetation, especially native and adaptive tall grasses, shrubs, and woods, this buffer acts to protect the surface waters from nonpoint source pollution (contaminants carried via stormwater runoff). Both wetlands and riparian areas are regulated by the NJDEP. In order to develop a sustainable plan for water resources, the Township must understand the importance of these areas and the impacts from their development.

Shabakunk Creek at Drexel Woods in Lawrence Township
Photo courtesy of http://www.lawrencetwp.com/gallery-5.html

While groundwater is not nearly as visible as streams and lakes, it is still heavily impacted by the land use and development at the earth's surface. Interestingly, groundwater makes up approximately 30.1% of the earth's total freshwater, while surface waters,

including streams and lakes, make up only 0.3% (the remaining is held in icecaps and glaciers).[9]

The water cycle demonstrates how atmospheric moisture, surface waters, and groundwater are all interconnected. The figure below of the water cycle in an urban setting portrays the negative hydrologic impacts of urbanized development to both surface waters and groundwater. The impervious coverage caused by land development blocks water from infiltrating into the soil and recharging groundwater. As a result, when storms occur, more runoff enters the streams, causing increased flooding, and less water goes into the soil to recharge groundwater. In addition, during drought conditions, there is less groundwater (because of decreased recharge), causing a shortage in the availability of drinking water from wells and a shortage of groundwater flow into streams and lakes. The shortage of groundwater flow into surface waters (base flow) during low-flow conditions causes water quality to degrade, as a larger and larger percentage of the surface water is polluted water from point and nonpoint sources.

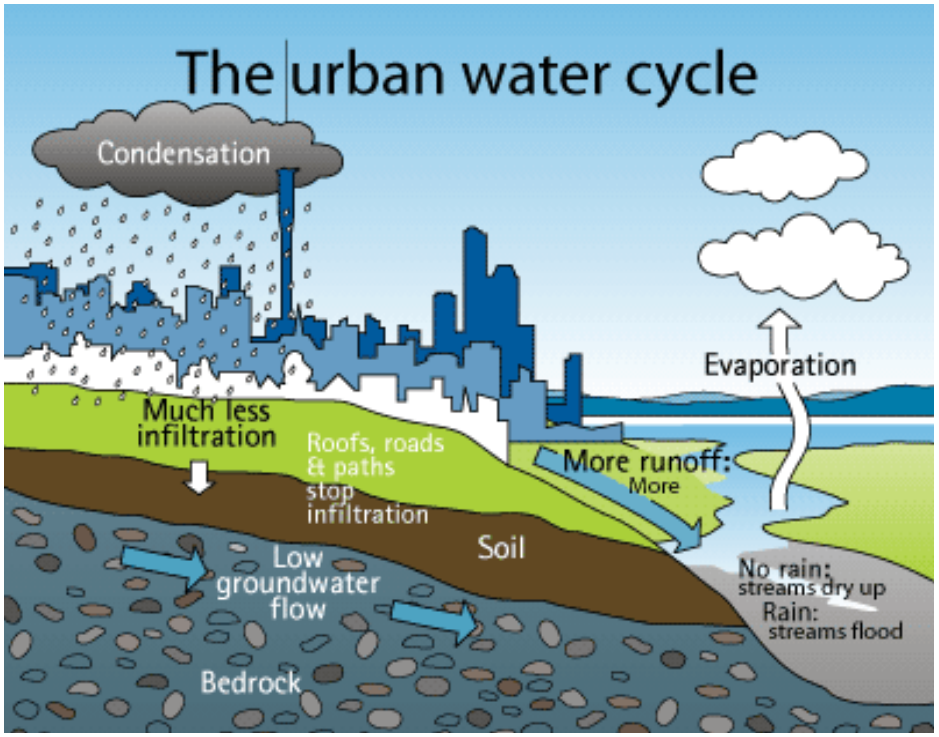

Image courtesy of http://www.aucklandcity.govt.nz/council/services/stormwater/about.asp

For these reasons, the Township should seek to reduce impervious cover. One of the largest sources of impervious cover in the Township is parking areas. The Land Use Ordinance should be evaluated for opportunities to reduce the required parking standards, as well as to create incentives to reduce impervious cover in existing and proposed developments. Additionally, porous pavement should be used when appropriate to increase water infiltration.

In order to mitigate the impacts of development and impervious cover, innovative stormwater management techniques can be used to treat and infiltrate runoff and mimic the natural hydrology. Some examples of these types of best management practices ("BMPs") include bioretention basins, porous pavement, infiltration trenches, and vegetated swales. The Township should encourage the use of these types of facilities that treat runoff, reduce runoff volume, and recharge groundwater. Unfortunately, the majority of the Township has been developed without the benefit of these types of BMPs. Many of the developments in the Township use traditional detention basins, which don't allow for any infiltration during most storm events. Other developments do not have any stormwater management BMPs. In order to improve stormwater management and reduce non-point source pollution in these areas, residents and business owners should be encouraged to use smaller on-site BMPs, such as rain gardens (small bioretention basins), dry wells, porous pavers, rain barrels, and disconnecting downspouts that are tied in directly to the storm sewers. If these types of on-site BMPs are used by many people in the community, they can become an effective tool to improving the water quality in the Township's watersheds.

Rain garden on a residential property in Lawrence Township
Photo courtesy of Chris Altomari

When humans consume water, the source may be many miles away and the energy required to treat and convey the water can be significant. In addition, the withdrawals from the surface waters and groundwater bypass the natural hydrology through hard piping. The water that is consumed then becomes wastewater which is then treated and later discharged further downstream. This bypass of the natural hydrology is, in part, a cause for the impairment of the local watersheds. In order to provide a sustainable water supply and healthier watersheds, it is important to incorporate water conservation strategies that will reduce consumption and keep water local to the community. Some examples of these types of strategies are infrastructure improvements, leak detection surveys, high-efficiency appliances, rain barrels, cisterns and low-maintenance native and adaptive landscaping that requires less irrigation.

Sustainable landscaping practices provide a number of benefits. Plants which are native or adapted to this region are geared toward the local climate and soil conditions. As such, they typically require fewer or no pesticides and fertilizers, which have a positive impact on water quality since the runoff will contain less or none of these inputs, and they are typically compatible with area precipitation rates and therefore require less irrigation, which has a positive impact on water quantity. While they may be well adapted to the region, invasive plant species shoudl be avoided. Invasive plant species are defined as introduced species that can thrive in areas outside of their range of natural dispersal and are commonly adaptable, aggresive and have a high reproductive cpacity. Invasive plant species can cause a loss of habitat as they replace native plants and landscapes which are relied upon by wildlife. They can also cause significant maintenance problems when they spread to unintended areas.

Sustainable landscaping practices also address watering methods. Property owners can reduce water use by installing drip irrigation rather than sprinklers and installing rain sensors to ensure that plants and lawn areas are not watered when it is unnecessary.

An additional consideration of sustainable landscaping is the reduction of lawn areas. Lawn areas do not provide good water infiltration and in fact, they can only absorb about a tenth the rainfall as a forested area.[10] Replacement of lawn areas with forest, meadow or naturalistic plantings can also lead to fewer fertilizer and pesticide inputs, therefore positively impacting water quality.

Rain barrel, Photo courtesy of http://www.backyardcomposters.com/store/1816388/product/Rain%20Barrel%201

Goals, Objectives & Strategies: Sustainable Water Resource Practices

Implementing sustainable water resource practices will provide reliably clean water to the current residents of Lawrence Township without compromising the ability of future generations to meet their own needs. The conservation of water quantity and the preservation and enhancement of water quality should be a priority, as related to our water supply and all the beneficial uses of water resources within the community. The goals for sustainable water resource practices must accommodate growth and redevelopment within the community and be integrated with land use and community planning.

Goal A : Encourage residents and business owners, through educational programs and incentives, to utilize water conservation practices.
Objectives
#1. Promote the use of high-efficiency appliances, such as water heaters, toilets, dishwashers, low-flow shower heads, and washing machines in the Township.
#2. Encourage recycling of rainwater and reuse of "grey" water for landscape watering and irrigation.
#3. Evaluate the Land Use Ordinance for opportunities to require landscaping vegetation that requires little to no irrigation, such as native plants and xeriscaping (landscaping or gardening that reduces or eliminate the need for supplemental watering or irrigation).
Goal B : Improve how runoff is managed and treated throughout the Township in order to improve water quality, increase groundwater recharge, and improve runoff management and treatment throughout the Township.
Objectives
#1. Encourage use of innovative stormwater management technologies that not only protect against flooding, but also address nonpoint source pollution, recharge groundwater, and mimic natural hydrology.
#2. Retrofit existing stormwater management infrastructure that is failing or not providing groundwater recharge and/or water quality treatment.
#3. Modify land use ordinances as necessary to encourage vegetated conveyance, rain gardens, bioretention islands, and other low-impact development strategies. (i.e. allow for depressed/slotted curbs along roadways, vegetated islands in cul-de-sacs, etc.).
#4. Encourage homeowners and business owners to use rain barrels, rain gardens, and porous pavement on their property.
#5. Promote the disconnection of impervious surfaces throughout the Township.

Goal C : Increase vegetated riparian buffers around surface waters in the Township to reduce nonpoint source pollution.

Objectives
#1. Direct the Township's remaining development potential away from riparian buffers, flood hazard areas, wetlands, and wetland buffers.
#2. Encourage compact development that preserves riparian buffers, wetlands, steep slopes, wooded areas and other environmentally sensitive areas.

Goal D : Encourage the use of sustainable landscaping in the Township.

Objectives
#1. Promote native plant and native ecosystem landscaping in development applications.
#2. Revise the Land Use Ordinance to prohibit the use of invasive plant species.
#3. Promote functional landscaping that provides runoff treatment, such as vegetated islands, rain gardens, bioretention areas, vegetative filters, constructed wetlands, etc.

Goal E : Reduce impervious coverage surfaces in the Township.

Objectives
#1. Evaluate the Land Use Ordinance for opportunities to reduce required impervious cover. Areas for consideration should include parking ratios, shared parking and/or pervious pavement.
#2. Promote use of porous pavement as an alternative to impervious surfaces where appropriate. Areas for consideration should include, but not be limited to, parking areas, pedestrian and bicycle facilities, and/ or emergency access areas.
#3. Provide incentives to reduce unnecessary impervious coverage on existing sites and development projects.

Goal F : Develop and implement an education and outreach program for the reduction of nonpoint source pollution in the Township's watersheds.