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IFAS Extension

Stormwater Reuse



Stormwater reuse retrofit project in Cocoa, FL serving a 12-acre downtown drainage basin. Photos courtesy of Eric Livingston.

Definition:

Although similar in concept to rainwater harvesting using rainbarrels and cisterns, stormwater reuse systems are typically much large in size using a surface detention pond or other water storage system to capture water and recycle that water for non-potable needs, especially irrigation.

Objectives:

This practice can significantly reduce demand on higher quality water sources, but is also considered part of a treatment train by allowing stormwater runoff a second chance to infiltrate into the ground and water is treated by landscape vegetation and soils.

Overview:

Stormwater reuse entails storing stormwater runoff from a surface pond or underground catchment device and then using it as a source of irrigation water. The philosophy behind the practice is that the lowest quality water should be used for the lowest quality need.

Applications

- **New construction**
- **Retrofits**
- **Commercial**
- **Residential communities**

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Benefits

- **Conservation of potable water**
- **Maintains hydrologic balance**
- **Improved water treatment**

Water Protection Benefits:

Water conservation implications – Potable water is directly conserved because stormwater acts as an alternative water source through direct substitution in landscape irrigation.

Stormwater implications – By redistributing captured stormwater across an extensive landscape area in a controlled fashion, this practice helps maintain the hydrologic balance and uses natural cleansing processes for improved water treatment.

Design Considerations:

This practice is somewhat infiltration dependent in the sense that water is applied to the landscape and then infiltrates naturally. Water intake systems should use horizontal wells placed in the subsoil below the storage basin or utilize a post pump filtration system to remove particulate matter. Although water conservation during irrigation should still be practiced, the type of emitter used should take into account the lower quality water supply and increased likelihood of particulate fouling. A backup source of water should be identified and factored into the design of the system.

Operations and Maintenance:

Stormwater reuse has relatively low requirements for maintenance. Irrigation pumps, filtration system, pipes and other components should be inspected and repaired as needed.

Credits in Green Building Certification Programs:

- FGBC-Development Standard (Category U-3: supply irrigation system with storm or reuse water)
- LEED for Homes (WE 1.1 rainwater harvesting system)
- LEED for Neighborhood Development Pilot (GCT Credit 3: Reduced Water Use)
- NAHB Model Green Home Building Guidelines (1.3.5 Manage storm water using low-impact development when possible)

Relative Costs:

Stormwater reuse is very cost effective for consumers and water utilities. Water costs for stormwater reuse range from $0.12 - $0.50 per kgal (thousand gallons) versus $2.00 - $5.00 per kgal for potable water. Many Florida-specific examples exist where utilities have profited from selling stormwater for irrigation to both residential and commercial consumers. For utilities, costs are low because of low energy requirements due to reduced stormwater treatment requirements.

References and Resources:

Shukla, Sanjay and Fouad H. Jaber. 2006. *Stormwater as an Alternative Source of Water Supply: Feasibility and Implications for Watershed Management*. UF/IFAS EDIS Circular 1493, Agricultural and Biological Engineering Department. http://edis.ifas.ufl.edu/pdffiles/AE/AE39800.pdf

Stormwater Reuse (Marty Wanielista) www.stormwater.ucf.edu/FILES/StC-P_Wanielista.B104.doc

Design Keys

- **Storage volume**
- **Irrigation demand**
- **Supplemental water source**
- **Water intake, pump, filtration and irrigation emitter selection**

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Stormwater Reuse: The Utility Business Practice (Gerry Hartman and Marty Wanielista) http://www.stormwater.ucf.edu/conferences/9thstormwaterCD/documents/StormwaterReuse.pdf

Stormwater Reuse: Why? And Examples (Marty Wanielista)

http://www.stormwater.ucf.edu/research/presentations/Reuse,%20Why%20and%20Examples.pdf

Credits

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