

Stormwater Management BMP Flip Chart

(This list is in no particular order. It includes, but is not limited to, BMPs and management actions that could used.)

(9/15/09 Technical Meeting)

Category of BMP or Management Action	A Type of BMP	B What are the major benefits for stormwater or groundwater (are there tradeoffs like you can control one but not the other?)	C How does location matter (e.g., should recharge areas be avoided)?	D What additional information is needed to decide if it is an appropriate BMP to meet the objectives?
Programmatic Incentives	LID (green design & treatment train) - Bioretention - Swales (shoreline row & landscape) - Buffers - Cisterns - Rain gardens	- Distributive Effect - Nutrient Removal	- First consideration - Recharge may need to be avoided depending on the method chosen	- Design cost - Cost- sharing with private
	Pervious Pavement	- Groundwater recharge - Surface water protection	Recharge may be a problem	- Maintenance Cost - Groundwater affect
	Green Roofs	Removing nutrients (rainwater only)	- Location - Type of Structure and cost of installation	Redesign or new construction
Structural BMP Improvements	"Bold & Gold" filter media/soil amendment	Nutrient Reduction	- Dry retention ponds - Pervious Pavement	Currently under research
	Polymers (absorptive media)	- Nutrient Removal	No location concerns	Maintenance Cost
Structural BMPs	Wetland	Nutrient Removal	Need property	- Maintenance Cost - Land Cost
	Large scale reservoir (lining ponds possibly creating wet detention)	Nutrient Reduction	Recharge may be a problem.	- Permitting Constraints - Public Buy in - Recharge
	Wet Detention	Public/ Political buy in - Nutrient Removal	- Recharge areas should be avoided	- Land use - Commercial vs. Residential
	Inlet baskets – size	- Nutrient Removal	No location concerns	- Maintenance (cost)
	Alum	- Nutrient Removal	No location concerns	- Maintenance cost - Groundwater affect

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Operational Guidelines	Ordinances (fertilizer reduction)	Nutrient Removal	No location concerns	Public buy in
	Container Nursery BMPs	Nutrient Reduction	Recharge may be a problem	Groundwater impact monitoring
Area-based Limitations	Restricting Reuse (reclaimed) - Governing watering - Drip irrigation in ROW (appropriate based on location)	Reducing nutrient input to areas of low or no stormwater treatment.	Using only in areas that have stormwater treatment. Focus of restrictions should be on the appropriate application of reclaimed water	Current stormwater runoff treatment available
	Not using exfiltration	Removing groundwater impact	- Not high recharge - Not low recharge	[left blank]
Water Conservation	Stormwater Reuse	Reduces surface water discharge (conservation)	Large scale systems (storm water pond size and ability to use the water)	Performance reliability
	Restricting Water Use (aquifer) - Governing watering - Drip irrigation in ROW (appropriate based on location)	Water conservation and reducing nutrient input to areas of low or no stormwater treatment.	[left blank]	[left blank]
Reuse Management	Increased treatment of reclaimed water	Reducing nutrient input	[left blank]	Consideration of cost
	Metering and volume based rates for reclaimed water	Monitor and discourage overuse of reclaimed water	-	-

Public Education Flip Chart

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General Public	Weeklong Riverfest with all communities participating, located in different communities throughout the week highlighting community commitment focusing on environmental issues in the Wekiva basin including a Governor's Proclamation for the week, good public speakers, etc	Educational benefits for both stormwater and groundwater	N/A	–
	Public Service Announcements that include reclaimed water and fertilizer information	Educational benefits/raised awareness for both stormwater and groundwater	N/A	–
	Fertilizer education at point of sale (i.e. irrigation, water conservation, plants)	Educational benefits for both stormwater and groundwater	N/A	–
	Provide soil testing kits for nutrients	Will assist homeowners in determining appropriate fertilizer applications	N/A	–
	Monitoring and reporting of nutrient concentrations in reclaimed water. Customer education on implications of monitoring results and whether additional fertilization is needed. Includes training for utilities staff on how to provide information on nutrients on reclaimed water	Educational benefits for both stormwater and groundwater	N/A	Reclaimed water data
	Public Education on illegal practices (i.e. pipes draining water from various sources into waters)	Eliminate illegal pollutant sources	N/A	–
	Education about available incentives	Educational benefits for both stormwater and groundwater	N/A	–

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Institutional Groundkeeper's Training	Gather occupational licenses of irrigation, pest control, and irrigation companies.	Readily available contact information for direct mail and training purposes.	N/A	Occupational licenses
	Irrigation design and maintenance training (including fertilization and lawn companies); require education units/certification requirements.	Reduce overspray and runoff		
	Municipal and school maintenance staff (education?)	Educational benefits for both stormwater and groundwater	N/A	–
	Golf course groundskeeper's education	Educational benefits for both stormwater and groundwater	N/A	–
Nursery Industry	Container nurseries implementation of DACS BMPs; research on effectiveness of DACS BMPs	Educational benefits for both stormwater and groundwater	N/A	Groundwater monitoring of container nursery sites
HOAs	Homeowners Associations Educations	Educational benefits for both stormwater and groundwater	N/A	–
Schools	Teacher training/curriculum development on water/fertilizer issues in springsheds/watersheds	Educational benefits for both stormwater and groundwater	N/A	–
	Incorporating fertilizer and reclaimed water education into school children's curriculum. Example: Expanding the Watershed Atlas/Wekiva	Educational benefits for both stormwater and groundwater	N/A	–

Wekiva Onsite Treatment BMP Flip Chart

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Replacing Onsite Treatment	Central Sewer	GW	Where it works	- Cost - Funding Source - Infrastructure needs - Address leakage issue
Improvements on Existing Onsite Treatment Technology	Use other technology, such as aerobic treatment units (ATUs), percolating systems, others	GW	Anywhere	- Costs - Location for measurement of results
	New Media for conventional systems (UCF Bold & Gold)	GW	Phase I Primary Zones	-Which design is most appropriate for an area? -Consideration of replacement time, "Cradle to grave" assessment - Disposal of Media -Cost - Location for measurement of results
Add-on Technology	Treatment Wetlands	GW	Anywhere	- Design criteria specific to location - Maintenance - Property value consideration
Design Standard	Improve Vertical Separation where there is a concern	GW	Area of high water table and depth of restrictive layer	[left blank]

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Septic Maintenance (private) Or Septic Maintenance (Government – with oversight function)	Septic Management Entity (Private or government)	GW	Everywhere	- Look at administrative costs - Who is set up as entity?
	Illegal Septic Discharge from septic tanks (locating & reporting)	SW	Everywhere	[left blank]
	Inventory of septic systems (number and location)	[left blank]	Everywhere	[left blank]
	Education of Contractors (pump-outs & inspections) - certification	[left blank]	Everywhere	- What would be required for a certification program? - State rule change?
Onsite Treatment Maintenance	Pump- outs/ certification every 3-5 years or during sale of home and Inspections	GW/ SW	Everywhere, starting with primary and secondary zones	Where do you take and dispose of the material?
	Education Program on proper upkeep of septic systems	GW/SW	Everywhere	[left blank]