Emerging Technologies

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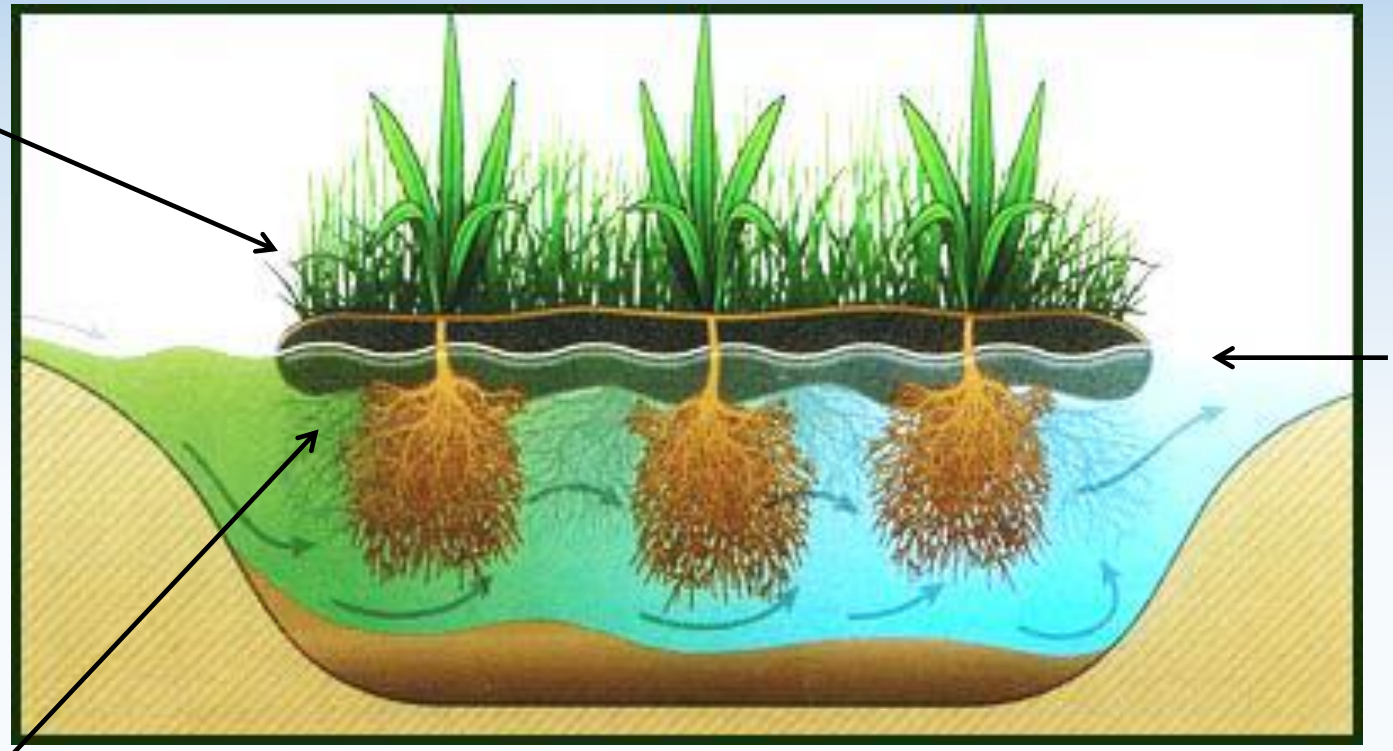
Two Amazing New Products for Florida

- Floating Treatment Wetlands “2.0”
- Groundwater Energy Passive System

Floating Treatment Wetlands™ by Martin Ecosystems

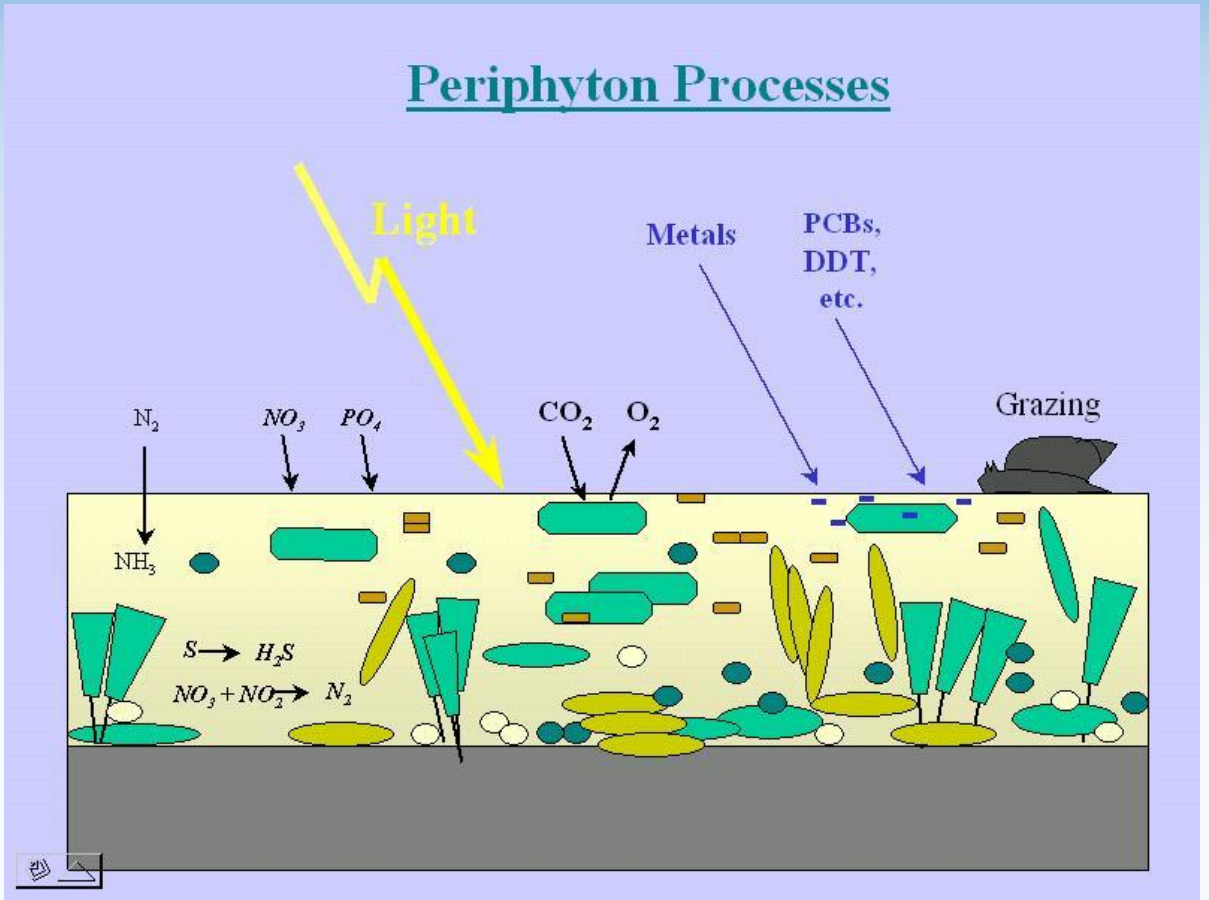
- Provides 12% Removal of TP and TN in wet detention ponds (Appendix O, A. H. Volume I)
- Stout eight-inch matrix provides tough platform for plants and root protection
- 20-year (minimum) lifespan

Anatomy of a Floating Island



Periphyton or Biofilm

Biofilm Extremely Important – Provides 40 to 80% of Nutrient Removal[1]



(1) Aquaculture Research, 2003, Volume 34, pp 685-695

Martin Floating Treatment Wetland Provides Incredible Surface Area for Biofilm

Durable Matrix Provides 20-Year Lifespan

Product Can Have Vegetation Already Established *Before* Launching

Pre-vegetated Matrix Strips
Planted, Rolled, Loaded, Delivered, Installed





Marine Floatation Provides Walkable Surface for Ease of Maintenance/Harvesting

Over 10,000 Floating Treatment Wetlands installed through out the world, 20+ years

DESIGN AND RESEARCH TEAM

Martin Ecosystems will directly provide engineering and scientific support for any scale of island project. BFWT demonstration projects have been completed in collaboration with federal, state, and local government agencies, as well as NGOs and private organizations and individuals:

1. CH2MHILL
2. Lincoln Park Zoo, Chicago
3. Coastal Conservation Association Louisiana
4. America's Wetland Foundation
5. Shell Oil
6. Entergy
7. Apache Oil
8. Kingsford Charcoal
9. Louisiana Department of Environmental Quality
10. Louisiana Department of Agriculture & Forestry
11. Oklahoma Water Resource Board
12. Terrebonne Parish Consolidated Government
13. Plaquemine Parish Government
14. Lafourche Parish Government

Martin Ecosystems research team includes individuals associated with North America's premier learning institutes in this region.

1. Louisiana State University
2. University of Central Florida
3. University of South Alabama

International collaborators include the National Institute of Water and Atmospheric Research in New Zealand.

FLOATING TREATMENT WETLANDS™

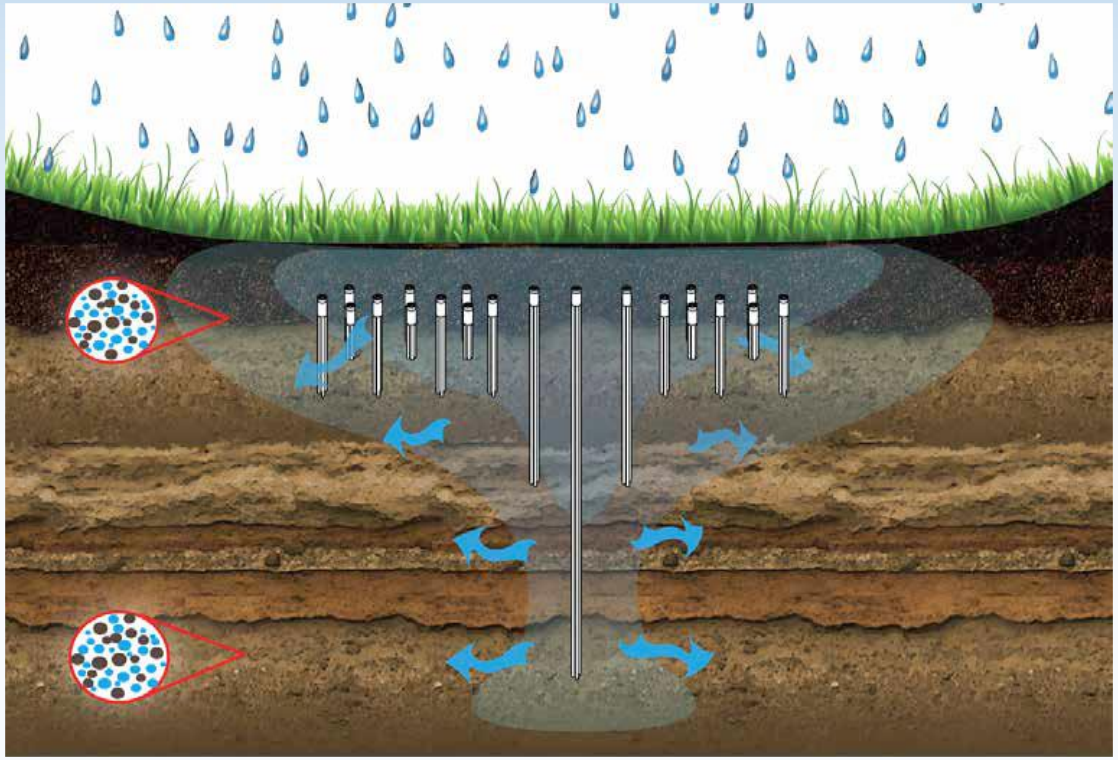
- A proven technology for long-term nutrient removal
- UV resistant and durable
- Simple to maintain
- Add nutrient removal to wet systems without any changes to the site plan

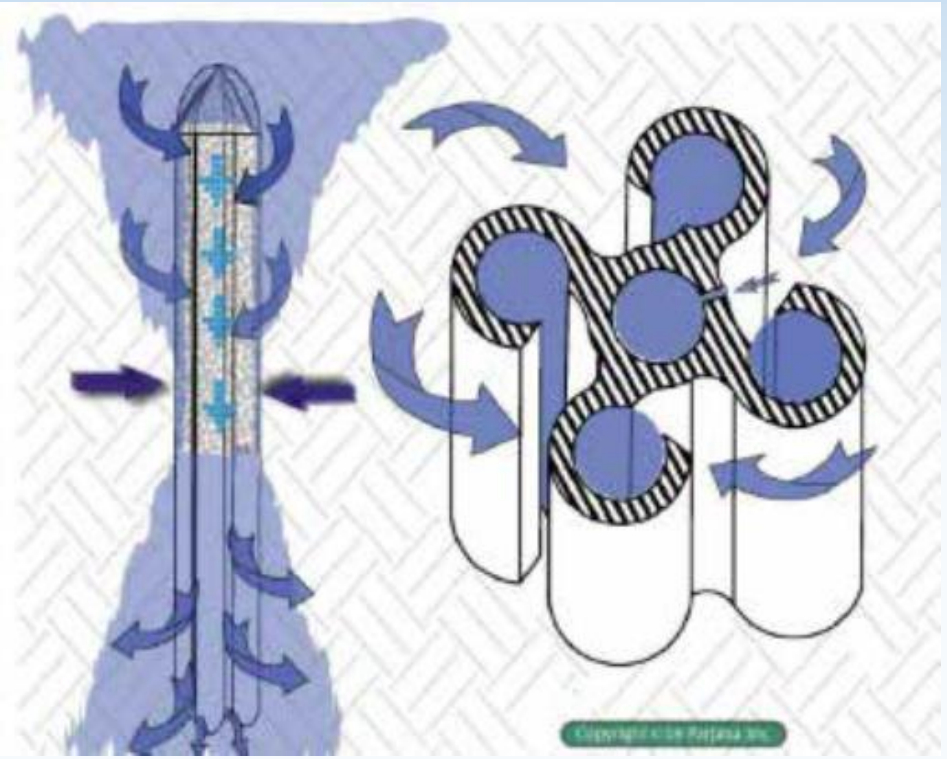
Groundwater Energy Passive System or "GEPS"

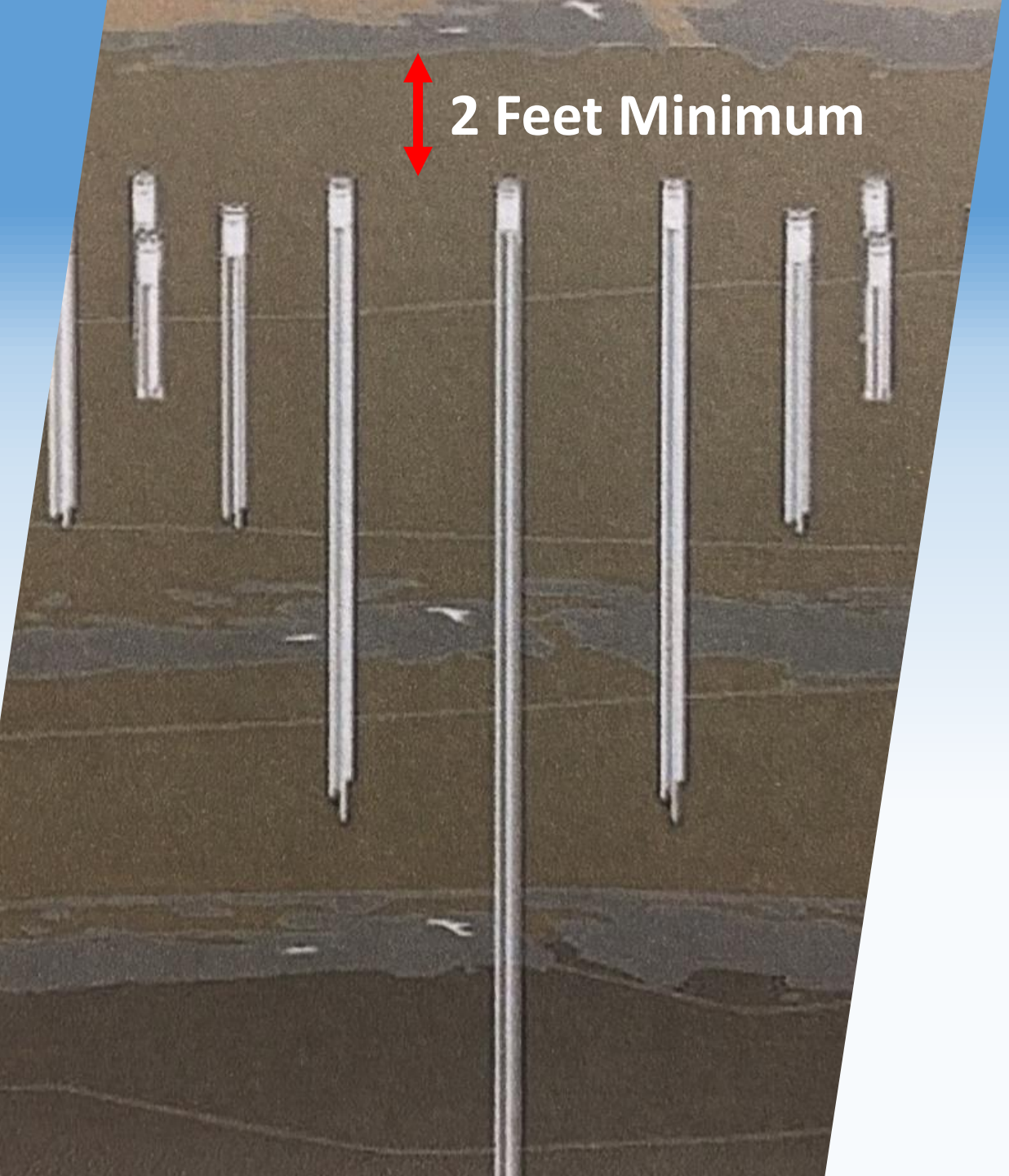
- Revolutionary new product for improving soil infiltration
- Ability to transform "D" soils to "A" soils
- Significantly increases groundwater recharge

GEPS System

Equalizes “Pore Water” Pressure Among Soil Layers in the Surficial Aquifer







GEPS Details

- GEPS® Installed in 5’, 10’, 20’, and 30’ Deep Sections
- Device Array Clustered about 3’ apart
- Installed 2’ below the land surface for groundwater protection

Installed with Compression Auger, Virtually no spoil is produced

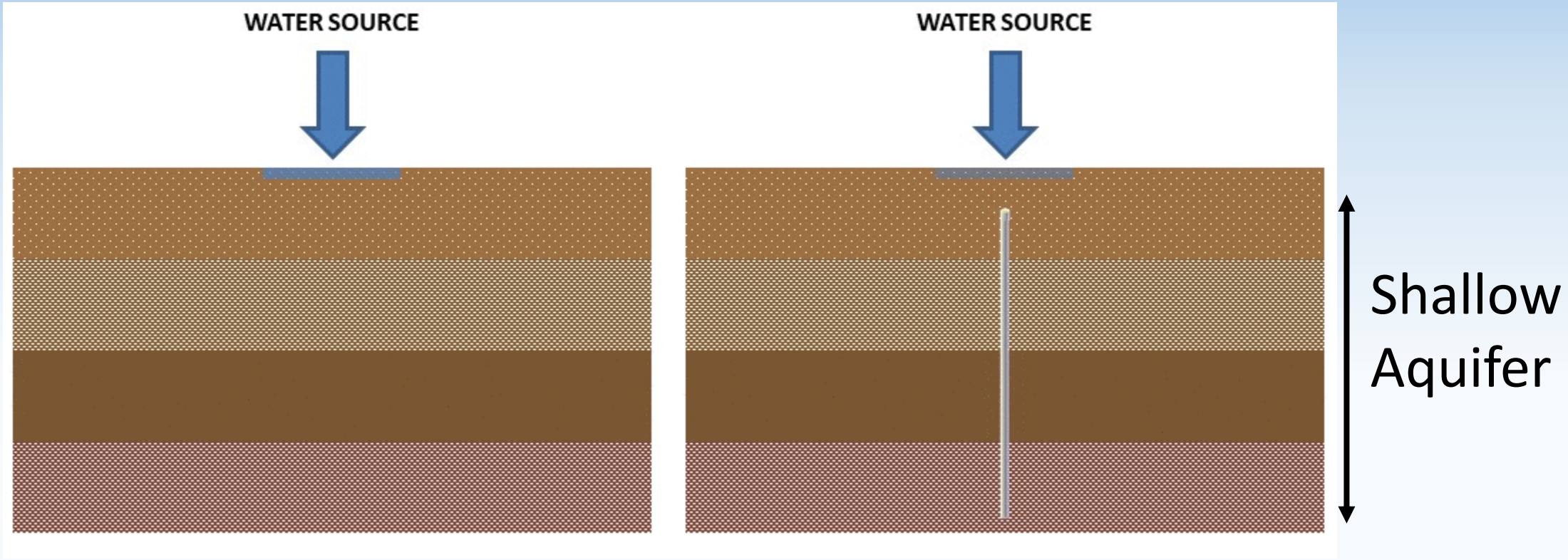
Installed in Days with No Site Disturbance

Simple In and Out

GEPS Illustrated

Native Soils

Native Soils with EGRP



Case Study: Belle Isle, Michigan

- Clayey Soils, Minimal Infiltration, High Groundwater Table
- Combined Sewer; Stormwater Treated at Sewer Plant
- Fees to Detroit Water & Sewer = $1.5 Million Annually
- Install GEPS as Last Resort

ECT Hired to Conduct Thorough Study(1)

- Independent Third-Party Study
- Monitored Installation of GEPS
- Monitored Rainfall
- Monitored Surface Runoff; Sewer Flows
- Monitored Groundwater Levels and Water Quality
- Compiled Technical Report of 3-yr study findings

(1) February 10, 2016 Technical Memo from Environmental Consulting & Technology To Michigan Economic Development Corporation

ECT Study Results

- GEPS Completely Eliminated Standing Water
- Surficial Water Table Elevation not Effected; Water Quality Unchanged
- Smaller Storms No Longer Contributed to Runoff Entering Sewer
- Discharge to Sanitary Sewer Reduced by 80% Annually; Representing a 7:1 Increase in Groundwater Infiltration

Escambia County Emergency Management Facility - Pond 95

GEPS more than doubled the measured infiltration rate!

GEPS – Groundwater Energy Passive System

- May very well change the world of stormwater, flood management, and groundwater recharge
- Hundreds of installations in North America; dozens in Florida
- Uses for retention basins, golf courses, ball fields, and virtually anywhere standing water is an issue
- In situ installation is quick and non-disruptive
- Maintenance-free and virtually unlimited lifespan

Project Hydrology, Inc.

- Our mission: to bring innovative stormwater management products to market
- These two ground-breaking technologies will change the current engineering paradigm
- Water quality, flood abatement, and groundwater recharge are critical factors for Florida

Why This Matters

Questions Please

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Please visit our booth for more information!