

# ALMY POND TMDL MANAGEMENT PLAN GREEN INFRASTRUCTURE PILOT TESTING PUBLIC WORKSHOP

Presented by:

City of Newport Department of Utilities

And

Pare Corporation

November 2, 2016

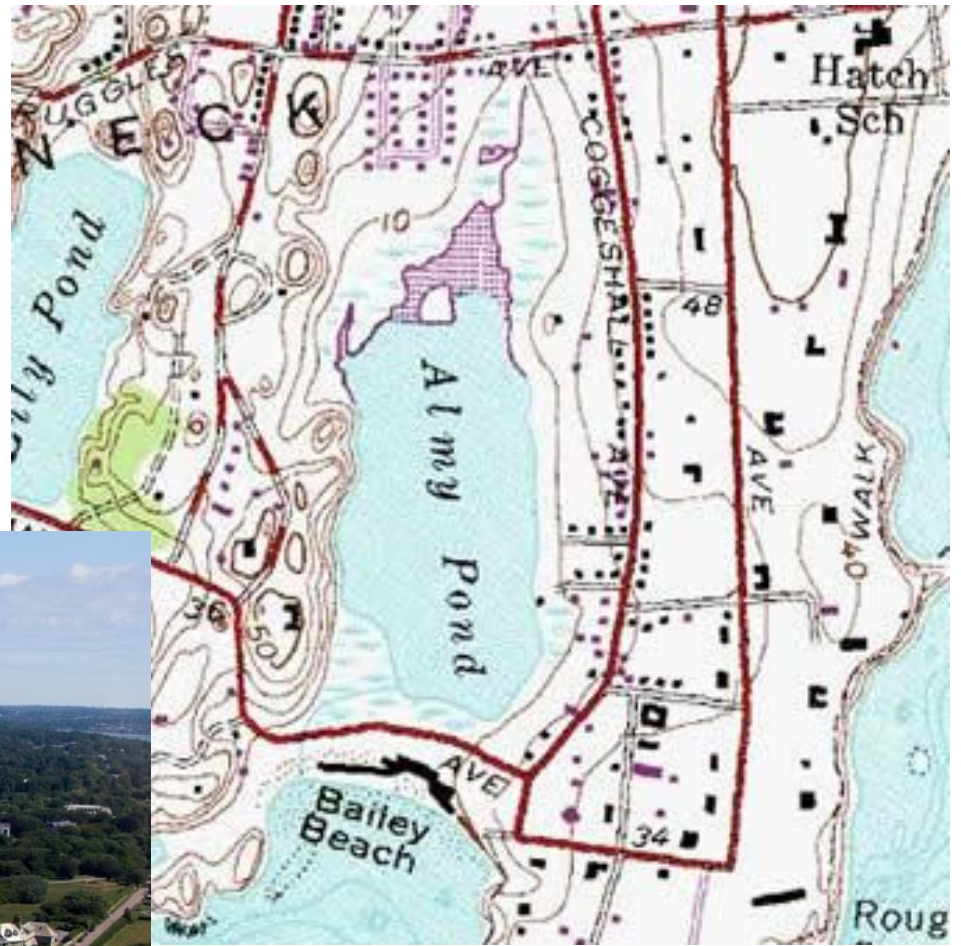


# Presentation Agenda

---

- Project Overview
- Steps Completed (what have we done to date?)
- On-going Activities (what are we doing now?)
- Next Project Steps (where do we go from here?)

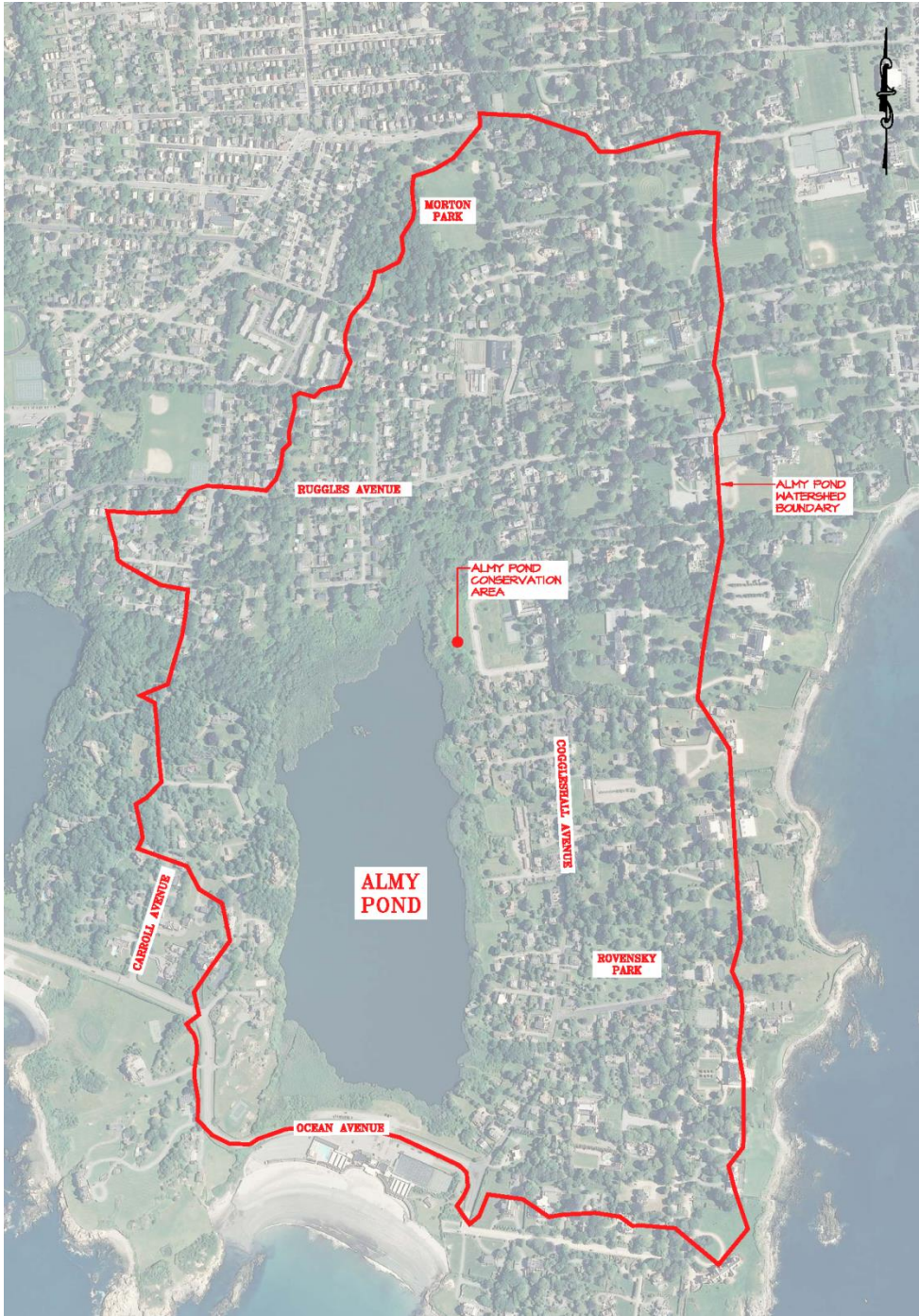
# Almy Pond



# Project Overview

---

- Pond Surface Area: 49.8 acres, average 3.9 feet deep
- Pond Watershed Area: 203.7 acres
- Primarily residential land use in the watershed. Sprouting Rock Beach Association located directly south.
- Primary sources of in-flow are surface water run-off directly to the Pond and stormwater run-off from City's drainage system (i.e. outfalls).
- Thirteen (13) identified storm drains discharging into Almy Pond



# Project Overview (cont...)

---

- RIDEM performed a TMDL study to address phosphorus and phosphorus related impairments in nine ponds in Rhode Island, per Section 303(d) of the federal Clean Water Act.
- Almy Pond was reported to have the most severe nutrient impairment of any of the nine ponds studied.
- The most significant impairment factors were thought to be:
  - Stormwater Runoff
  - Internal Cycling
- Lesser impairment factors include:
  - Waterfowl
  - Soil erosion
  - Atmospheric deposition



# Steps Completed

---

1. Conducted initial assessment of phosphorus sources
2. Developed TMDL Management Plan
3. Developed Catch Basin Retrofit Program
4. Obtained grant funding to implement Plan
5. Began implementation of Plan

# Steps Completed (Initial Assessment)

---

- Between March & September 2013, an assessment was completed of phosphorous sources in the Almy Pond watershed. Assessment included:
  - Shoreline survey of stormwater outfalls
  - Stormwater sampling and analysis
  - Pond surface water and sediment sampling
  - Watershed mapping and characterization



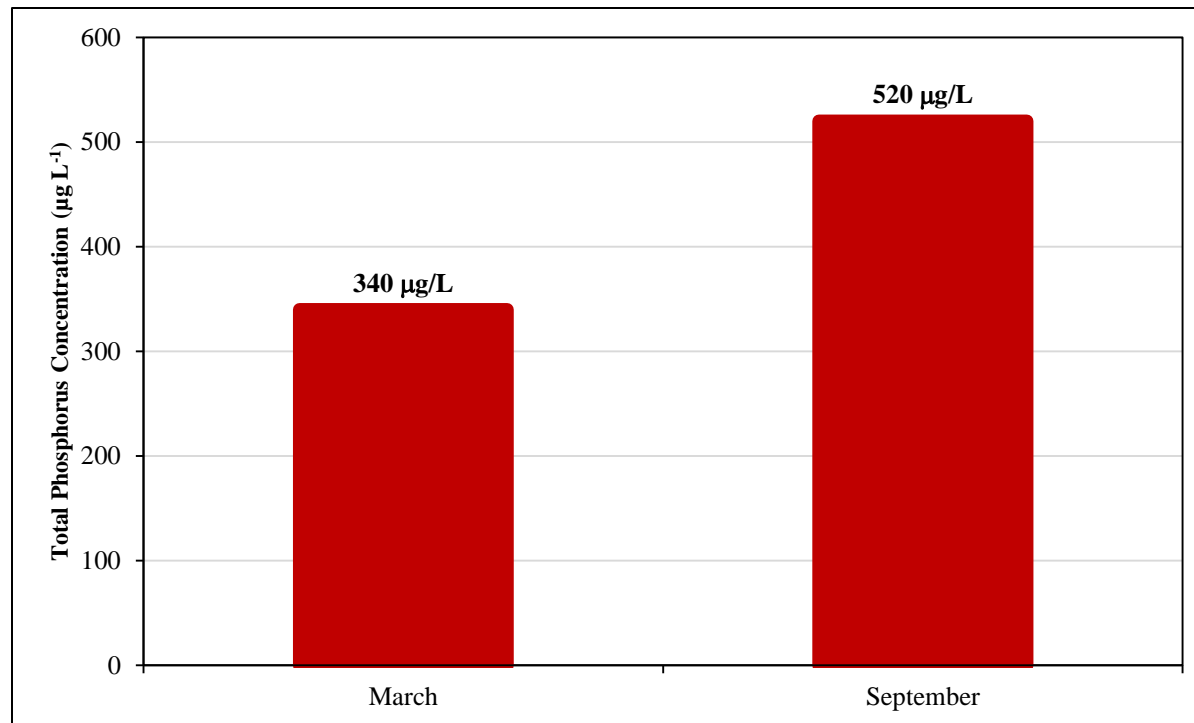


# Steps Completed (Initial Assessment)

---

- Results from 2013 indicate that the primary source of phosphorus is stormwater runoff entering the Pond.

Average total phosphorus concentrations measured in stormwater during March & September 2013

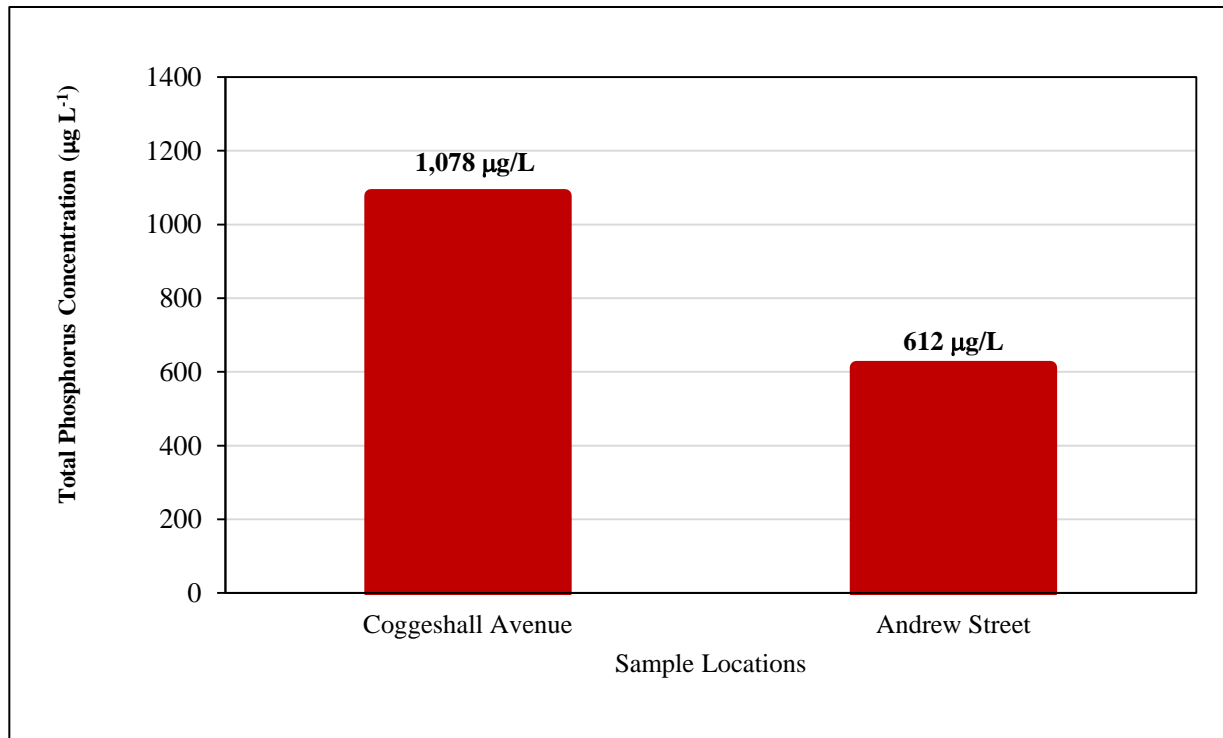


# Steps Completed (Initial Assessment)

---

- Results of a recent sampling round in the pilot study area also reported high concentrations of total phosphorus

Average total phosphorus concentrations measured in stormwater during October 2016



# Steps Completed (TMDL Management Plan)

---

## TMDL Management Plan

- Developed a four-tier management plan to reduce phosphorus loading to Almy Pond.
- Each tier represents a different approach to phosphorous reduction
  - Tier 1: Public outreach and education program (ongoing)
  - Tier 2: Implement watershed-wide non-structural BMPs (ongoing)
  - Tier 3: Identify and implement watershed-wide structural BMPs and LID practices (3-5 seasons)
  - Tier 4: Develop and implement internal pond sediment management strategies (if necessary)

# Steps Completed (Catch Basin Retrofit)

---

- 187 catch basins were evaluated in the Almy Pond watershed between April and May 2015.
- The City is currently working on replacing and retrofitting catch basins to maximize sediment removal.



# Steps Completed (Grant Funding)

---

- City of Newport received a \$250,000 Narragansett Bay Watershed Restoration Fund Grant from the RI Department of Environmental Management for pilot testing green infrastructure in the Almy Pond watershed.
- City will provide \$250,000 in matching contributions to the project.
- The grant period runs through January 2018.

# Steps Completed (Plan Implementation)

---

- Developed Pilot Scale phosphorus removal program.
- Three potential pilot areas were identified and then focused down to one.
- Pilot study area is in the northern sub-watershed along Coggeshall Avenue, Bateman Avenue, and Vanderbilt Avenue.

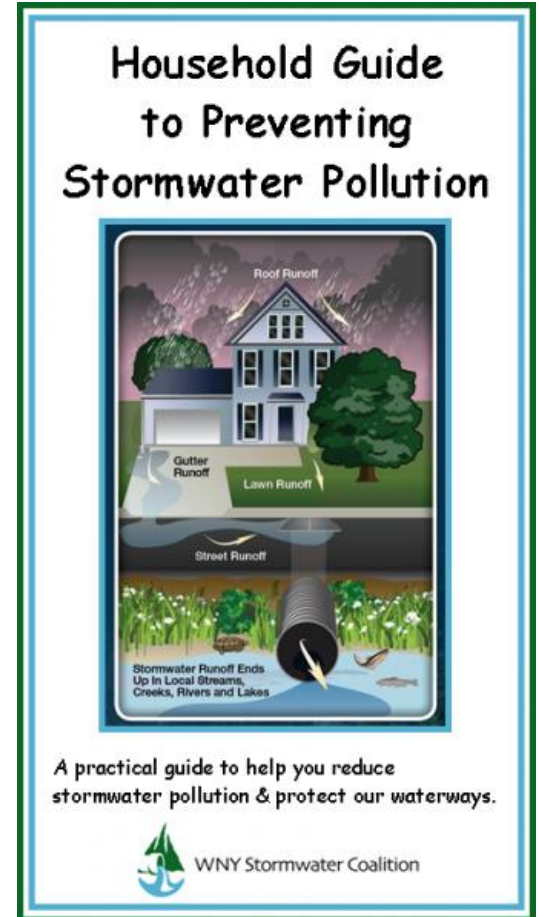
# Steps Completed (Plan Implementation)



Proposed Pilot Study Area

# Ongoing Activities

- Public Outreach and Education Program
  - Public Meetings
  - Household Stormwater Management
  - School Programs/Classroom Education
  - City Website Development





# Ongoing Activities

---

- Pare and the City are working to identify non-structural BMPs to install in the watershed.
  - Dog Waste Stations
  - “Good Housekeeping” Efforts
    - Catch Basin Cleaning
    - Street Sweeping



# Ongoing Activities (cont...)

---

## Implementing Non-Structural BMPs in the watershed:

### Pros

- Simple to incorporate within the watershed
- Relatively inexpensive
- Minor disturbance to the watershed
- Requires only minor maintenance/upkeep.

### Cons

- Requires long term commitment from the City and the public
- May require a new City ordinance to enforce required level of commitment
- Requires a strong level of public participation to be effective

# Ongoing Activities (cont...)

---

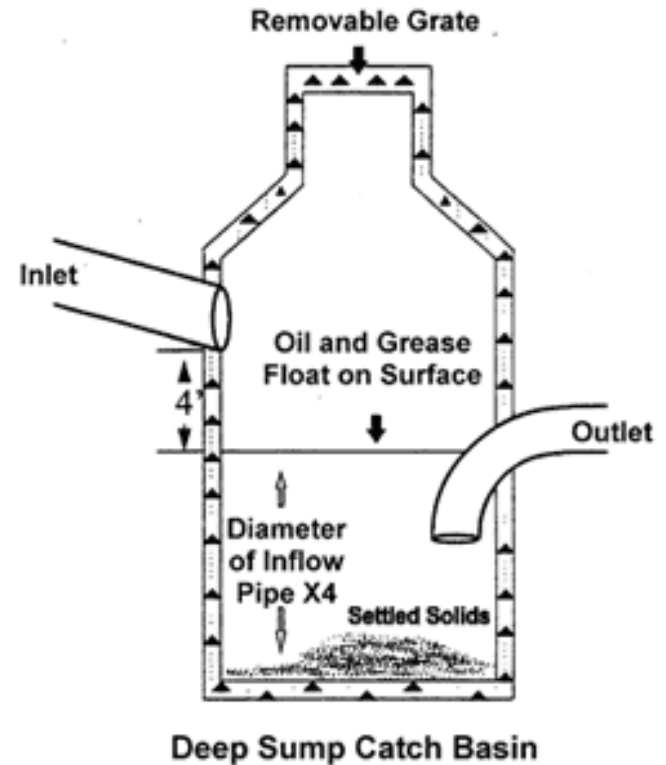
## Pilot Scale Design

- BMP selection includes:
  - Deep Sump Catch Basins
  - Hydrodynamic Separators
  - Adsorption Media Filters
  - Tree Filters
  - Filter Strips
- Why were these selected?
  - Small footprint
  - Easy maintenance
  - Large phosphorus removal
- Developed hydraulic model of pilot study area.

# Ongoing Activities (cont...)

## Deep Sump Catch Basins

- Pros:
  - Small footprint
  - Compatible with subsurface storm drain systems
  - Provides pretreatment for downstream BMPs
  - Easy access for maintenance
  - Remove bulk TSS (“particulate-bound phosphorus”)
- Cons:
  - No ability to control volume of stormwater
  - Requires frequent maintenance
  - Requires proper disposal of trapped sediment and oil and grease

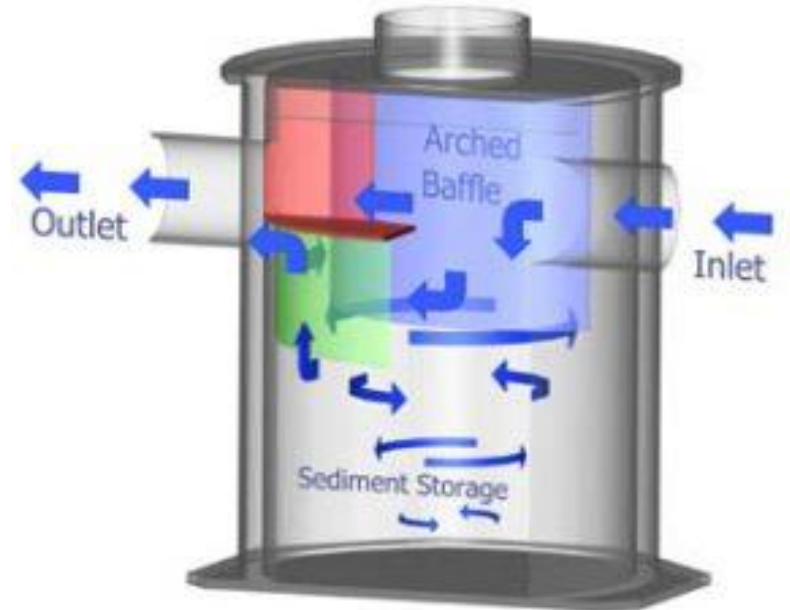


# Ongoing Activities (cont...)

---

## Hydrodynamic Separators

- Pros:
  - No moving parts; easy maintenance, minimal repairs
  - Good for small sites and retrofits
- Cons:
  - High costs for larger units
  - Can promote vectors due to standing water
  - Need large flows to be effective



# Ongoing Activities (cont...)

---

## Adsorption Media Filters

- Pros:
  - High total phosphorus removal
  - Small footprint
  - Can be custom designed to fit specific needs
- Cons:
  - Requires regular maintenance
  - Larger units have high costs
  - Media requires replacement

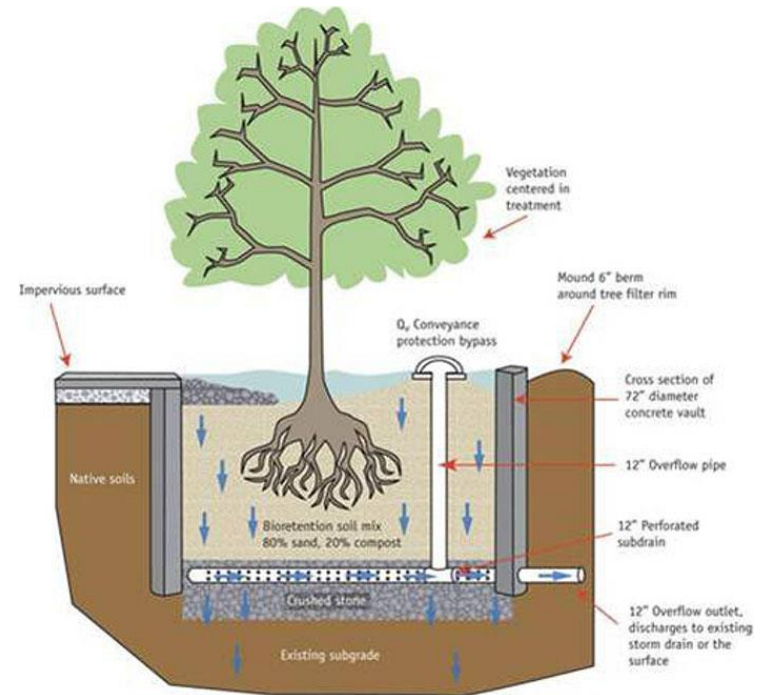


Oldcastle Stormwater Solutions Perk Filter™

# Ongoing Activities (cont...)

## Tree Filters

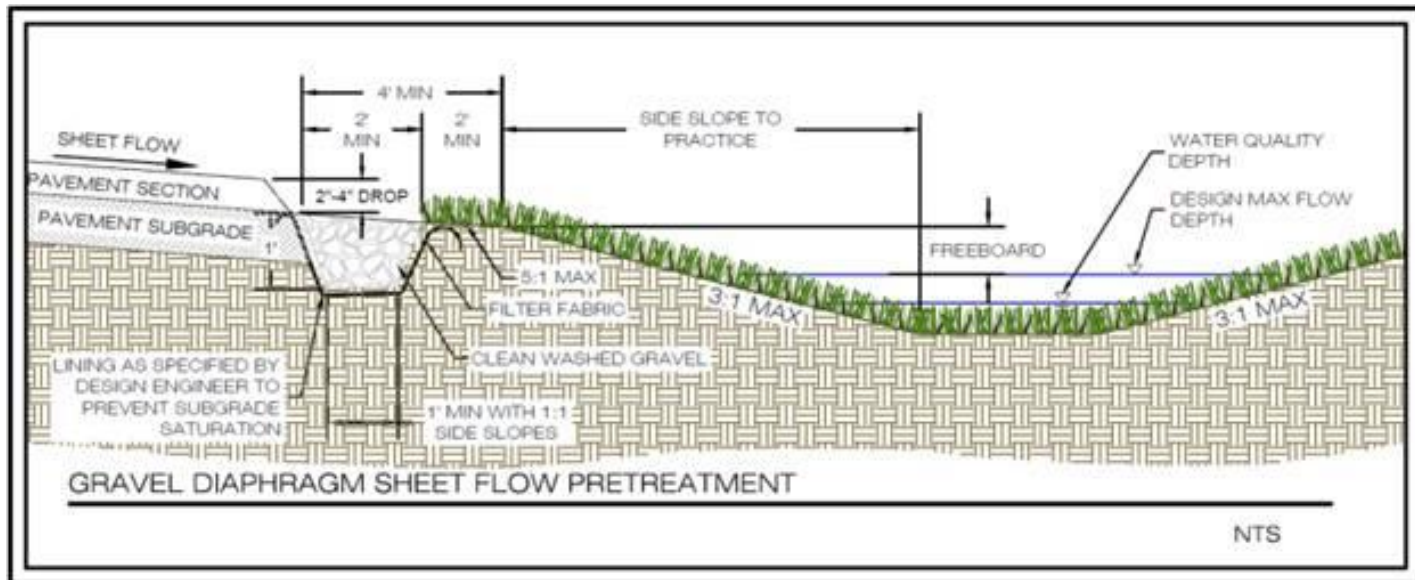
- Pros:
  - Effectively manages runoff on a small scale
  - Relatively inexpensive
  - Good for urban retrofit
- Cons:
  - Requires well draining soils that may not be native to the site
  - Requires regular maintenance



# Ongoing Activities (cont...)

## Filter Strips

- Pros:
  - Low costs
  - Allows for increased infiltration
  - Recharges groundwater
  - Accents natural landscape
- Cons:
  - Regular maintenance and more landscaping required
  - Only effective if sheet flow can be maintained through the filter strip





# Next Project Steps

---

- Continue stormwater sampling for phosphorus in pilot study area
- Refine hydraulic model utilizing field data obtained from sampling
- Submit 100% design drawings and specifications to RIDEM for review.
- Upon RIDEM approval, construct pilot scale measures
- Post-construction study conducted over a course of 2 years.

# Questions and Comments

---

