



**Low Impact Development Practices
For Stormwater in our Semi-Arid Environment:
A Regional Dialogue**

March 15, 2011

Joel D. Valdez Main Library

Basement Conference Room

101 N. Stone Avenue, Tucson, AZ 85701

8:00 a.m. – 4:00 p.m.

“From BMPs to LID to Green Infrastructure – Case Studies”

Going Green?



“From BMPs to LID to
Green Infrastructure
– Case Studies”

Let's Look Into It!

1. [Stantec and Green Infrastructure: An Overview](#)
2. [Gray to Green for the 2010 Olympics](#)
3. [Stantec's Green Roof](#)
4. [Stroudwater Landing](#)
5. [Meadow Walk at Lynnfield](#)
6. [Stantec R&D Efforts and Research Partners](#)

Stantec's Structural Solutions



Bioretention
Cistern



Constructed Wetland
Detention Gallery
Detention Pond



Green Roof



Infiltration Basin
Infiltration Trench
Porous Pavement
Retention Basin
Rain Barrel



Rain Garden
Sand Filter
Vegetated Buffer
Vegetated Swale
Wet Pond

Non-Structural Solutions

- involve the public
- better planning
 - no **new** issues – get it right from “day one”
 - disconnect & reduce impervious areas
- more maintenance
 - street & storm drains
 - green BMPs
- dumping control
- illicit connections
- stormwater reuse

Stantec’s Rebecca Jenkins and 5th Graders From Norman E. Day School Building Their “Living Lab” Rain Garden in Westford, MA



Gray Infrastructure

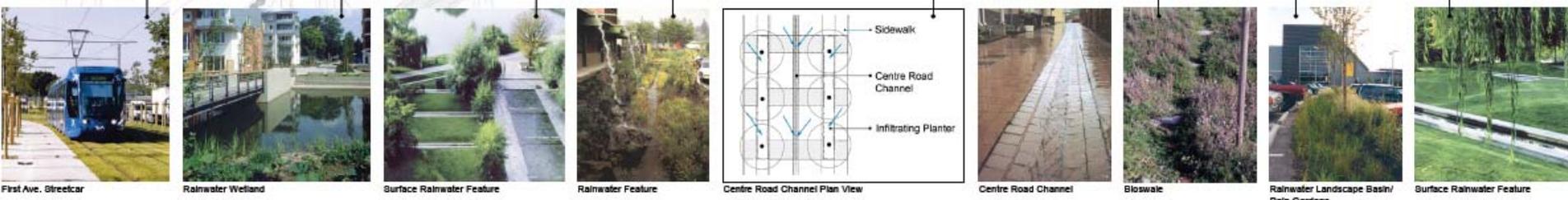
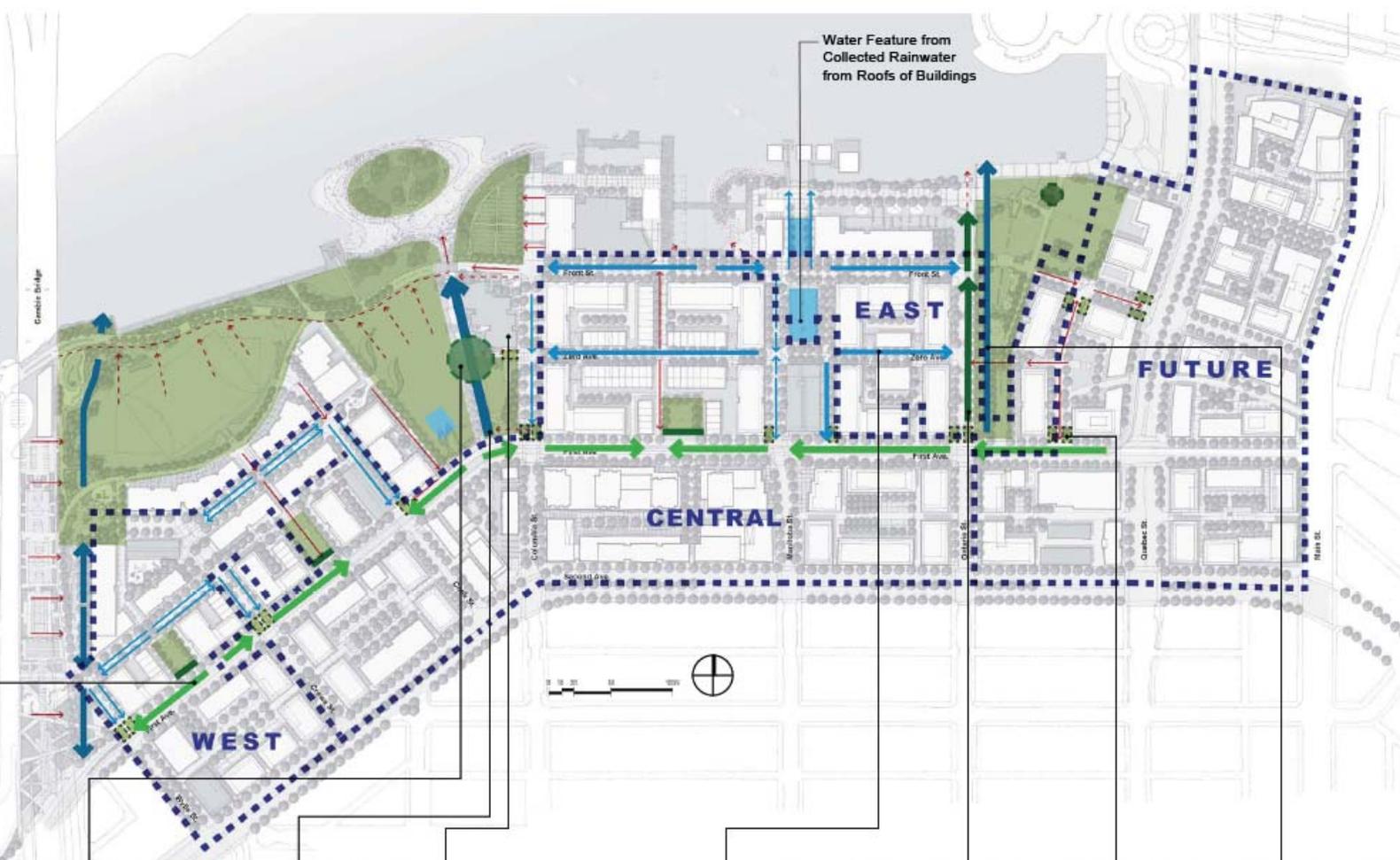


**Southeast False Creek: Site of Olympic Village
and Eventual Home for 14,000 Residents**

Stantec Green Infrastructure

LEGEND

-  Infiltration Area
-  Cistern Water Storage
-  Rainwater Landscape Basin
-  Rainwater Wetland
-  Open Landscape Bioswale
-  Centre Road Channel
-  Road Channel
-  Surface Rain Feature
-  Infiltration Strip
-  +4.0 Elevation
-  Direction of Surface Slope/Drainage
-  Direction of Subsurface Drainage
-  Watershed Areas



First Ave. Streetcar Rainwater Wetland Surface Rainwater Feature Rainwater Feature Centre Road Channel Plan View Centre Road Channel Bioswale Rainwater Landscape Basin/ Rain Gardens Surface Rainwater Feature

Stantec Green Master Planning

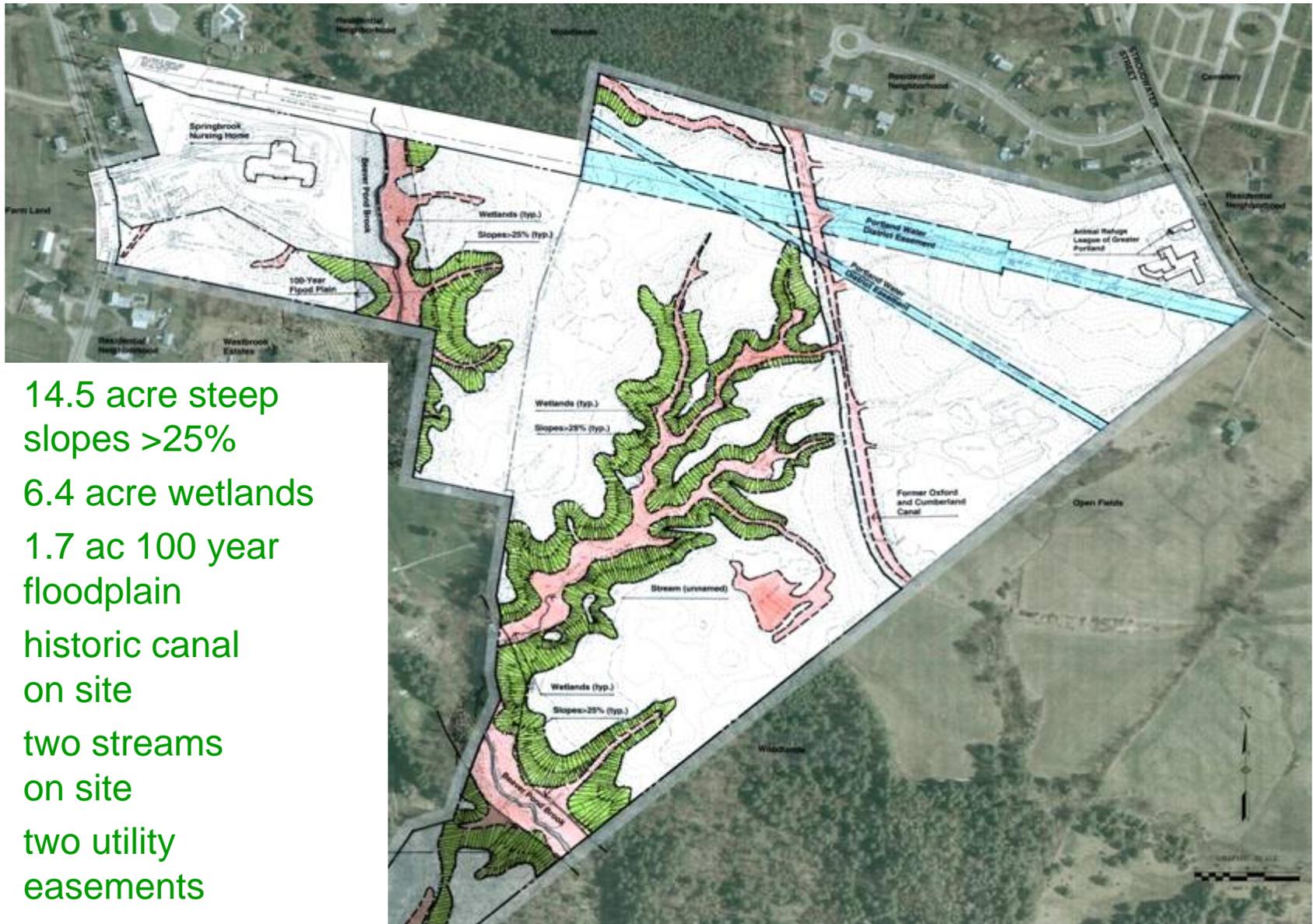


OVERVIEW:

- 66 acre parcel
- 103 residential units
- cluster development
- 41 rain gardens
- 19 filtration ponds
- 8 filterra tree box filters
- 9 turnouts/buffers

Stroudwater Landing
Westbrook, Maine

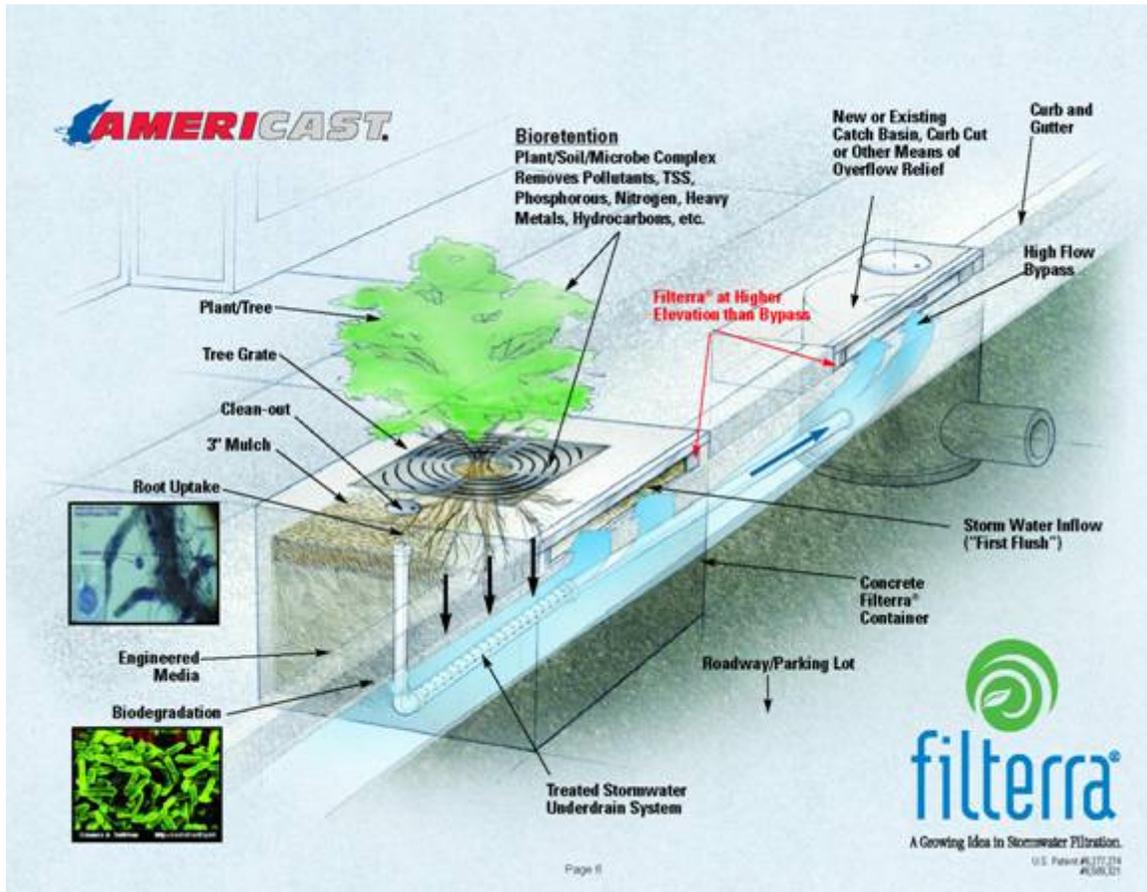
Existing Site Conditions / Constraints



- 14.5 acre steep slopes >25%
- 6.4 acre wetlands
- 1.7 ac 100 year floodplain
- historic canal on site
- two streams on site
- two utility easements

Innovative Solutions

- filterra



Meadow Walk at Lynnfield: A Green Site



OVERVIEW:

total site – 203 acres

total developed area – 114 acres

reedy meadow – 500 acres

Meadow Walk at Lynnfield



- porous asphalt
 - UNH SC detail used
 - curve number when used with stone reservoir – 100
 - curve number when used without stone reservoir – 39
- construction considerations
 - staging concerns
 - over excavation
 - roof drain



More Stantec Green BMPs



Wet Detention Ponds



Constructed Wetlands



Bio-retention Cells

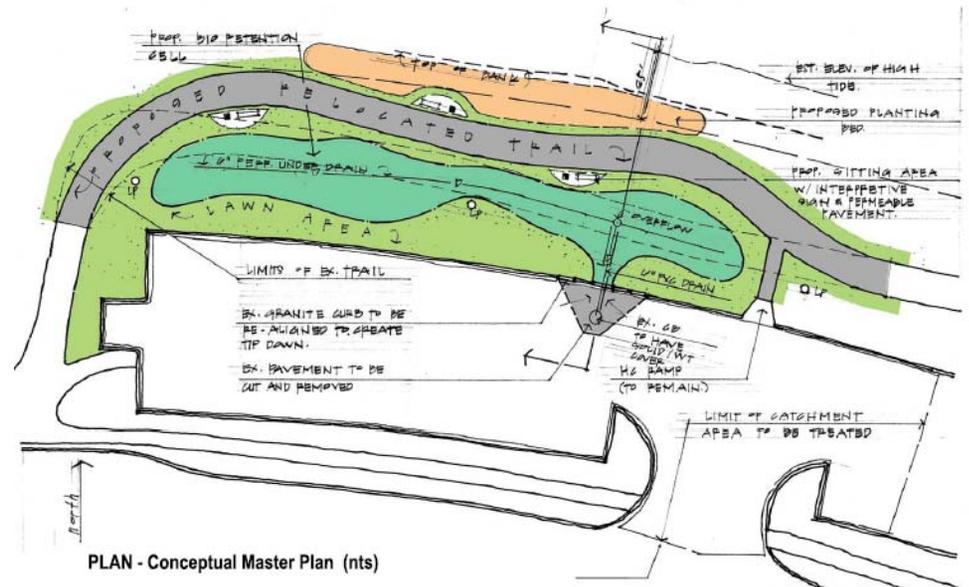


Rain Gardens

BIO-RETENTION CELL DEMONSTRATION PROJECT



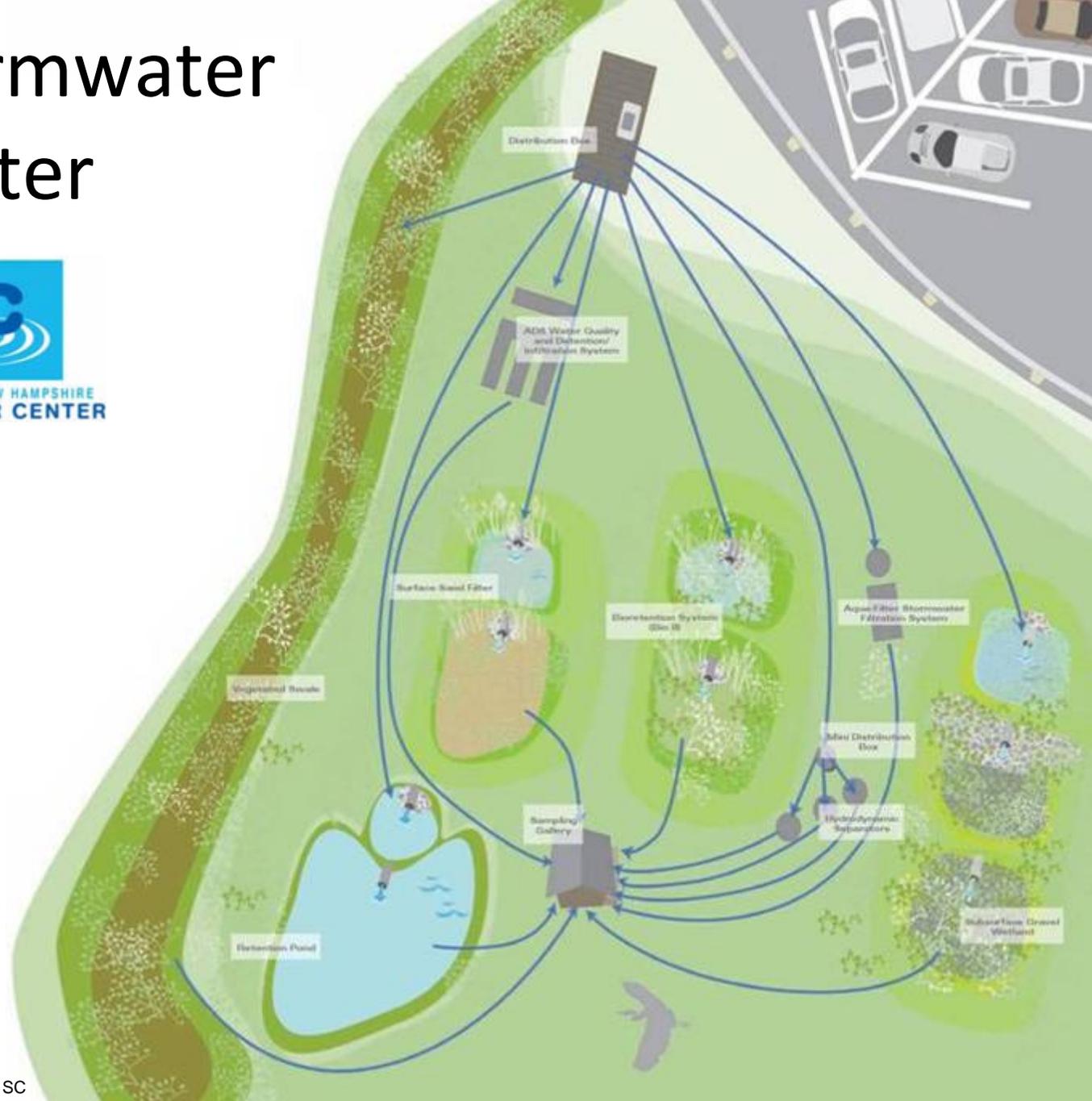
**Stantec's Green
Infrastructure
Research and
Development**



The Latest From Our Research Partners at UNH and NCSU



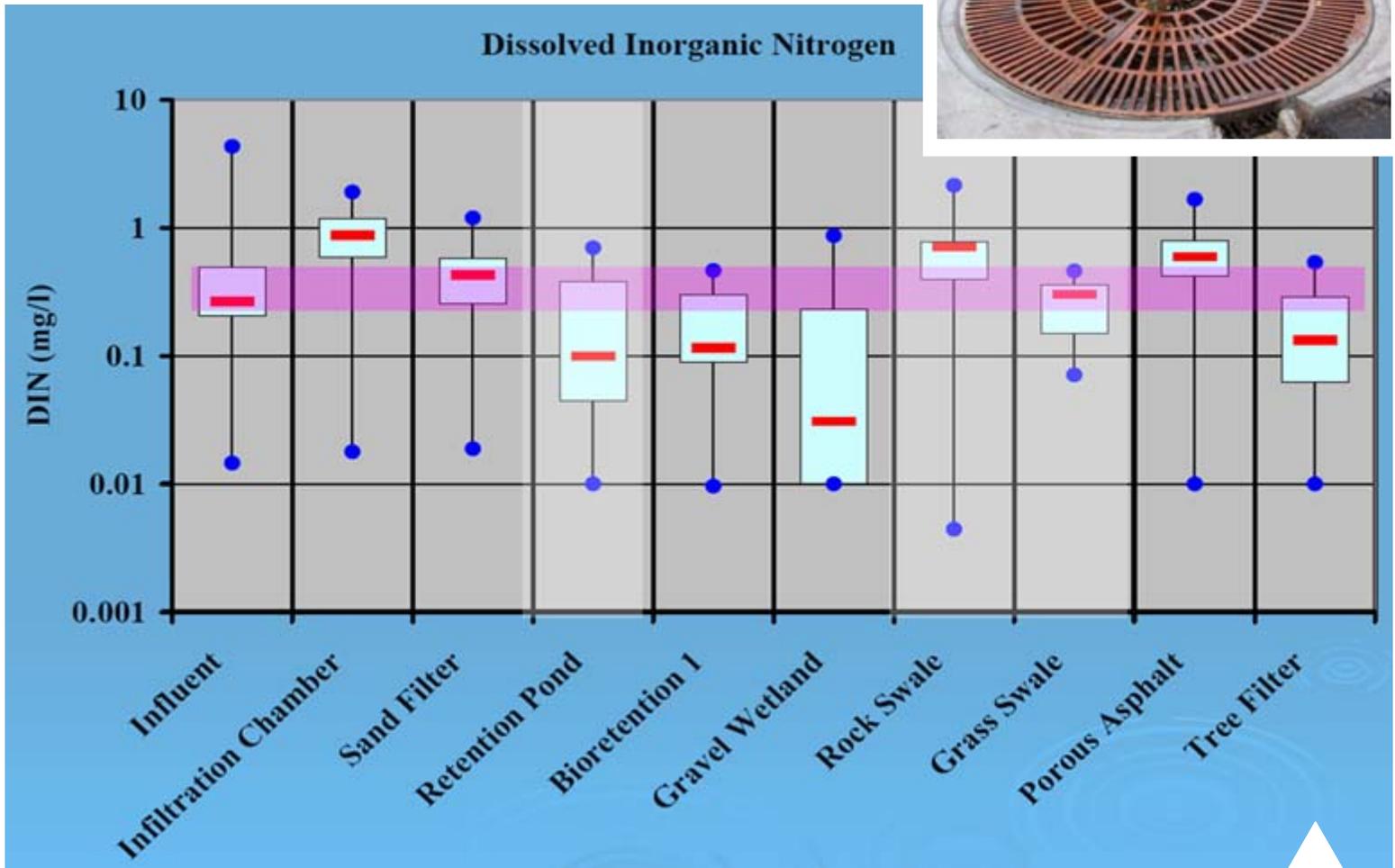
UNH Stormwater Center



UNH Research

- water quality: N

Image Credits: UNH SC



NCSU Stormwater Center Group

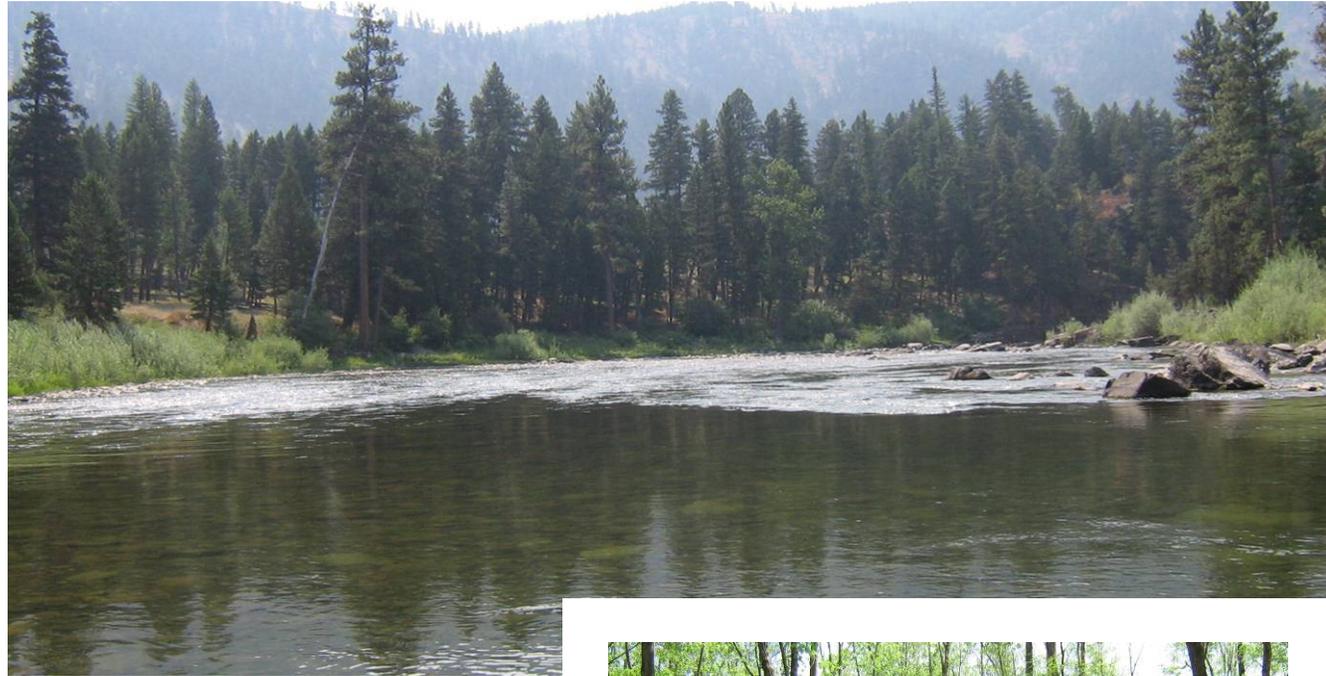


NCSU Stormwater Center Group



Ecosystem Restoration

- Ecological Restoration
- Threatened & Endangered Species
- Environmental Permitting



public amenity

storm flow control

flood risks

water & air quality

temperatures

ecosystem health

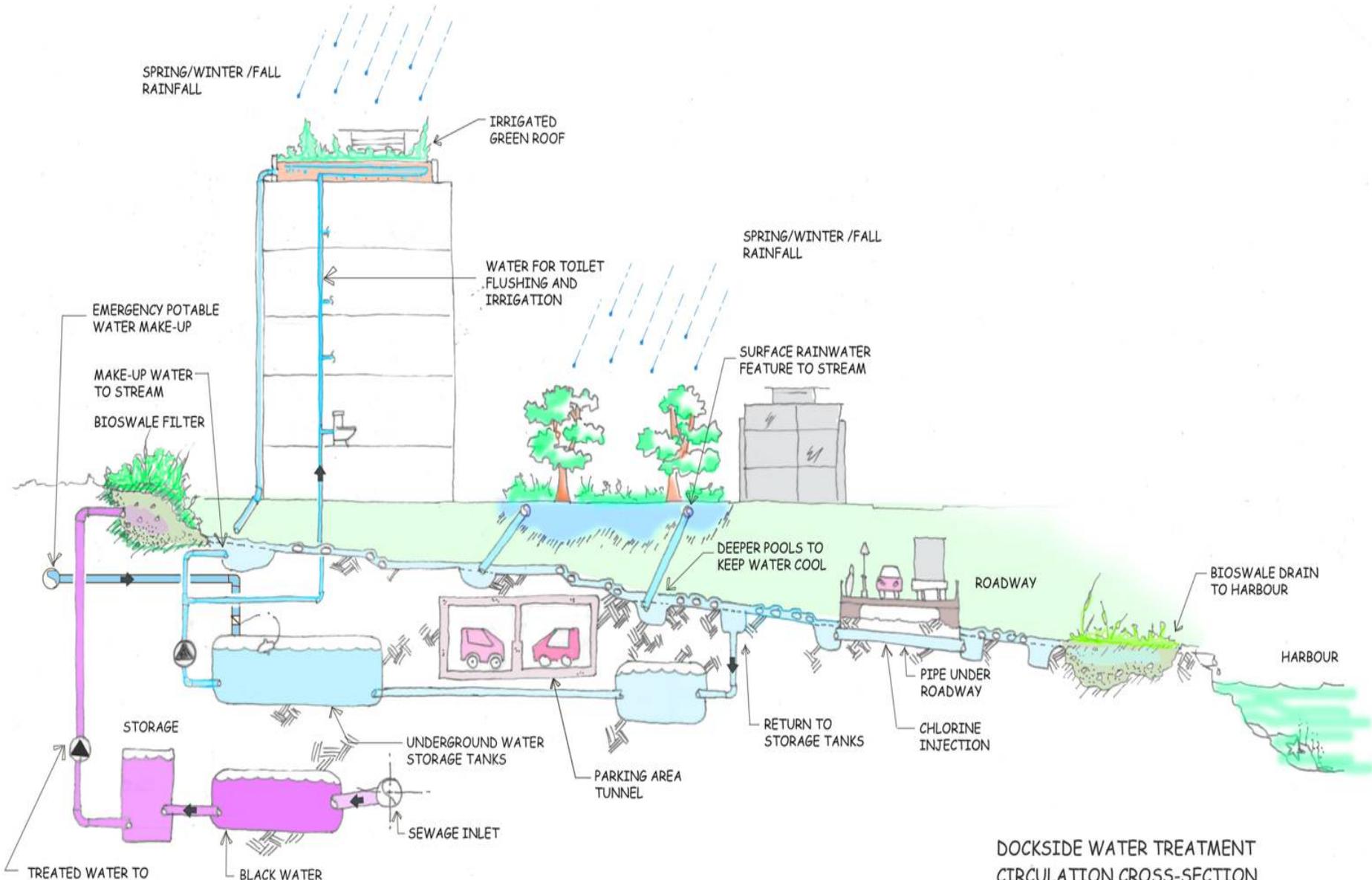
carbon footprint

groundwater recharge





Integrated Urban Water System Design



Stantec Green Infrastructure

Notable Project Locations

Advanced Green Infrastructure Modeling: Stroudwater Landing, ME

2010 Olympic Games Green Design: S.E. False Creek, Vancouver BC

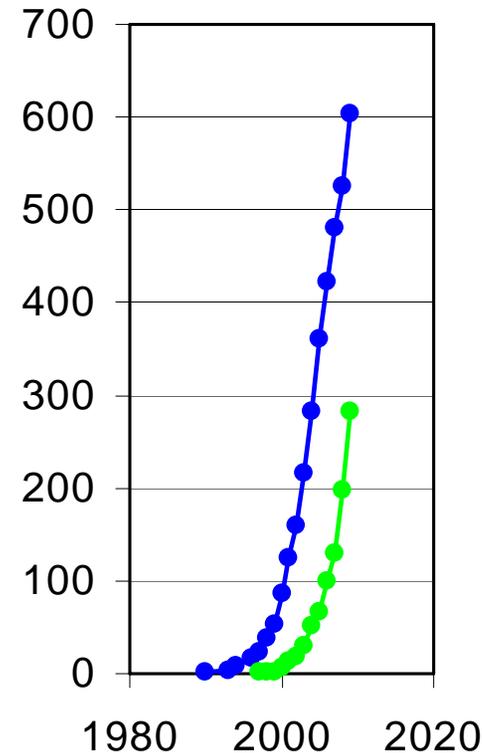
Pond Creek Watershed Green Sol'n: Louisville Metropolitan Sewer District

Franklin County Green Infrastructure BMP Demonstration: Columbus, OH

Stantec Green Infrastructure R&D: Portland, ME and Westford, MA

Numerous Green Roof Sites, Including Stantec Offices

● Ponds and Wetlands
● Green Infrastructure



**Dozens of Technologies, Hundreds of Sites,
and Research Partnerships with UNH / NCSU**

DISCUSSION