

The Challenges: Landscape and Fire





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Urban Influences



70% of SMA's in the Los Alamos/Pueblo Watershed are impacted by urban areas.

50% have potential for public influence

Some SMA's are heavily impacted by runoff /run-on from urbanized areas.

Techniques LANL are already using

Erosion & Sedimentation Controls

Management of Run-on and Run-off

Minimization of Non-Storm Water Discharges

Control of Litter & Debris, Dust, and other wastes

Examples of Baseline Control BMPs:

- Berms, straw wattles
- Vegetation/Compost cover
- Seed/Mulch/Erosion Control Blankets
- Check dams (rock, juniper bales)
- Channels/swales
- Vegetated buffer strips
- Gabions
- Sediment Traps/Basins

Stormwater Runoff Treatment

Think like a watershed

Infiltrate, evapotranspirate and slow down runoff

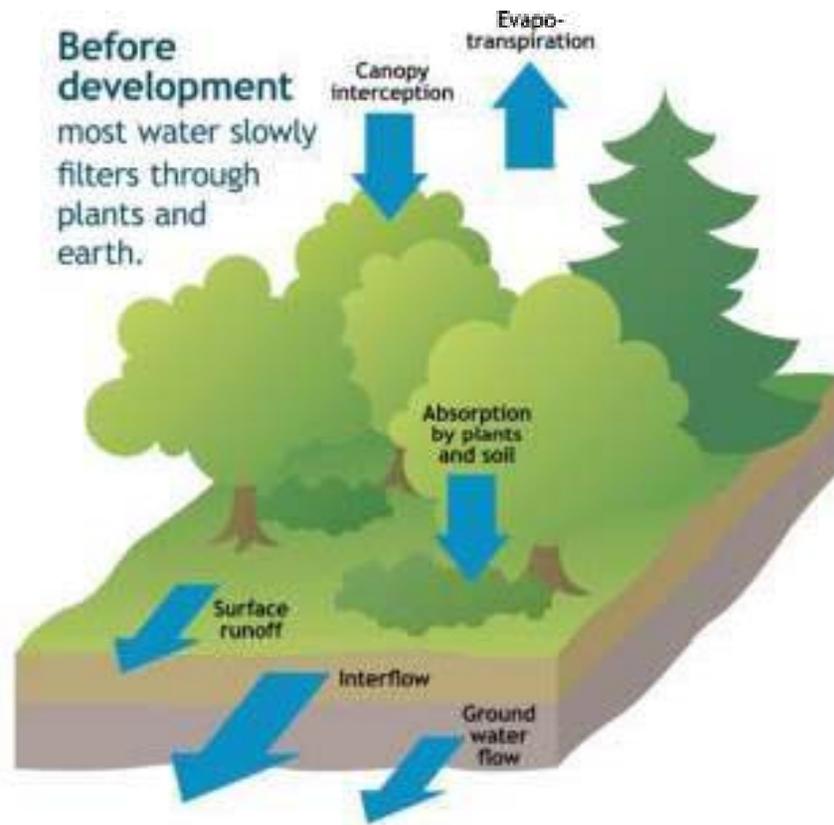
Minimize erosion and sediment transport

Treat stormwater close to the source

Use pervious areas for more effective stormwater treatment

Water Harvesting within the landscape

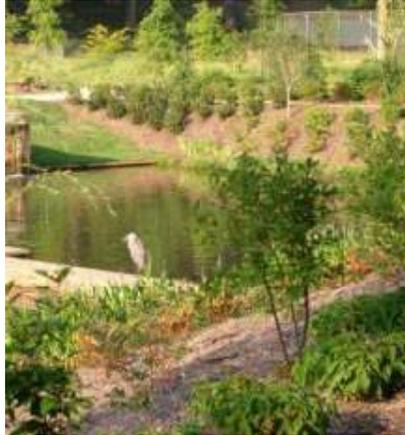
Stormwater Impacts



Source: Biohabitats

Landscape Positions

Landscape



Parking Lots



Around Buildings



Walkways and Other Paved Areas



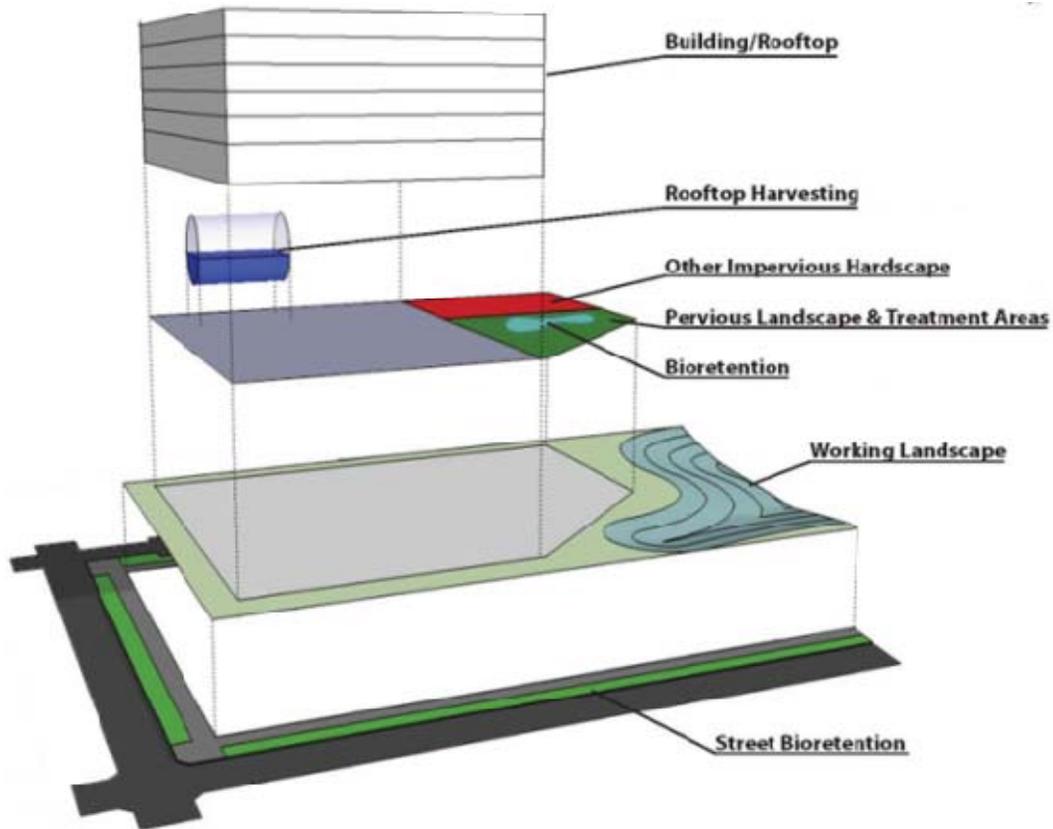
Streets and Streetscapes



Rooftops



Take a Roof to Stream Design Approach



Source: Biohabitats

Rainwater harvesting
Rainwater interception
Landscape buffers
Rooftop vegetation
Permeable pavement
Biofiltration
Bioswale conveyance
Ponds and wetlands
Outfall treatment

Rainwater Harvesting



Rainwater Interception



New Mexico



Denver, CO



Fort Collins, CO

Biofiltration



Fort Collins, CO



Snow Hill, MD



Belen, NM

Bioswale Conveyance

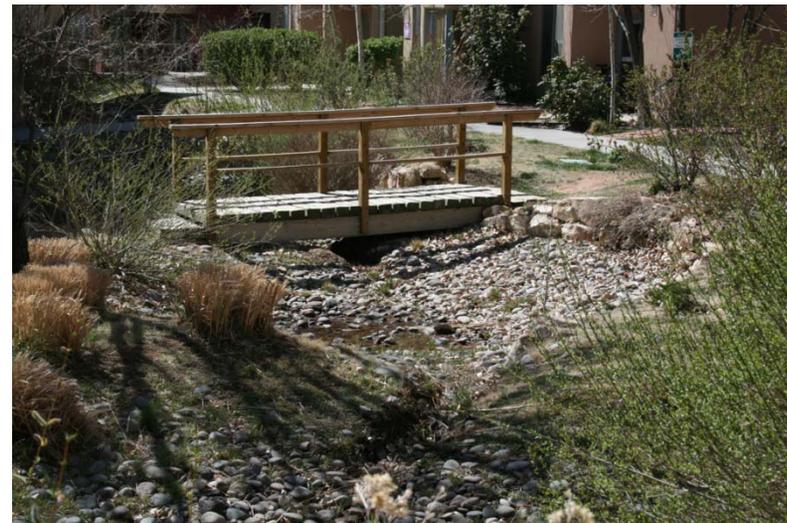


Santa Fe, NM: Zuni Bowl at planting and 1 year after planting. Courtesy of The Rain Catcher

Bioswale Conveyance



Santa Fe, NM (The Raincatcher)



Santa Fe, NM

Ponds and Wetlands



Santa Fe, NM



Belen, NM

Outfall Treatment



Washington, DC



Anne Arundel Co., MD

Stormwater Management Principles

- Slow stormwater runoff velocity and reduce volumes
- **Settle, capture, bind, and/or remove contaminated sediments**
- Convert ornamental landscape areas to biofiltration
- Amend soil with compost, improve soil microbiology

SWMU A

Issues

- **Contaminated materials from building and existing drainage system in stormwater runoff**
- Drainage passes through to SWMU B

Opportunities

- **Disconnect rooftop and surface runoff to cisterns and bioretention**
- Install sediment traps

SWMU B

Issues

- **Concentrated contaminants from campus, serves as main drainageway**
- **Trees and stream are ecologically and aesthetically valuable**

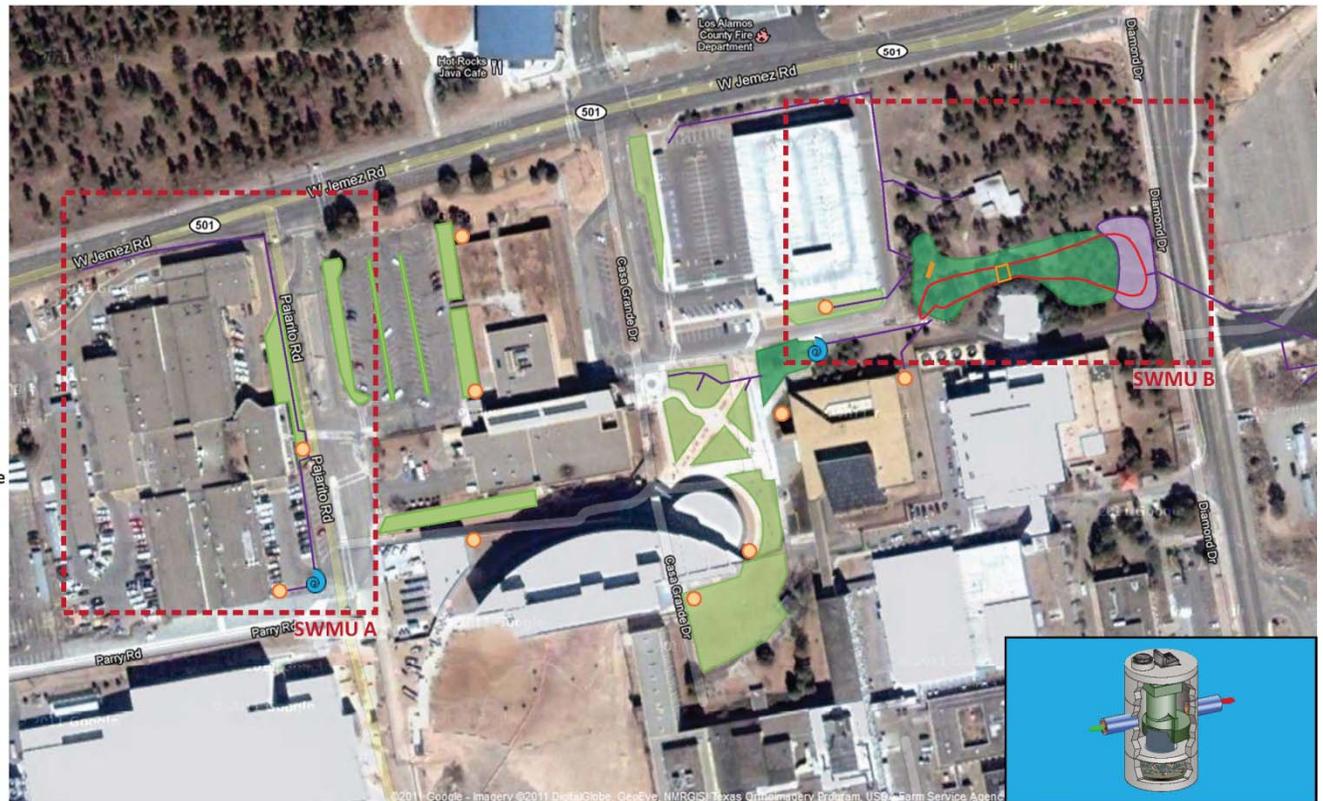
Opportunities

- **Expand existing channel to larger, wider wetland to slow and filter runoff**
- Amend soil with compost
- Add native and phytoremediating plant species

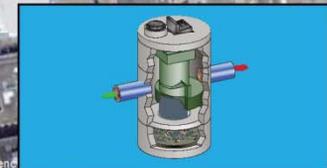
Legend

- existing storm drain
- existing gabion
- proposed bioretention rain garden
- proposed wetland
- proposed phytoremediation planting
- proposed rainwater cistern
- proposed sediment trap / vortex separator

*Locations and footprints are for illustrative purposes only and design requires confirmation



LANL SWMU Drainage Area & SW BMPs



Sediment Trap / Vortex Separator



Rainwater Cistern



Bioretention/Biofiltration



Pond/Wetland



Phytoremediation