

Stormwater:

A water supply opportunity

**Urban Water Reuse Partnership Project between TreePeople
and the Los Angeles Department of Water and Power**

**Rebecca Drayse, TreePeople
Mark Hanna, LADWP
June 17, 2009**



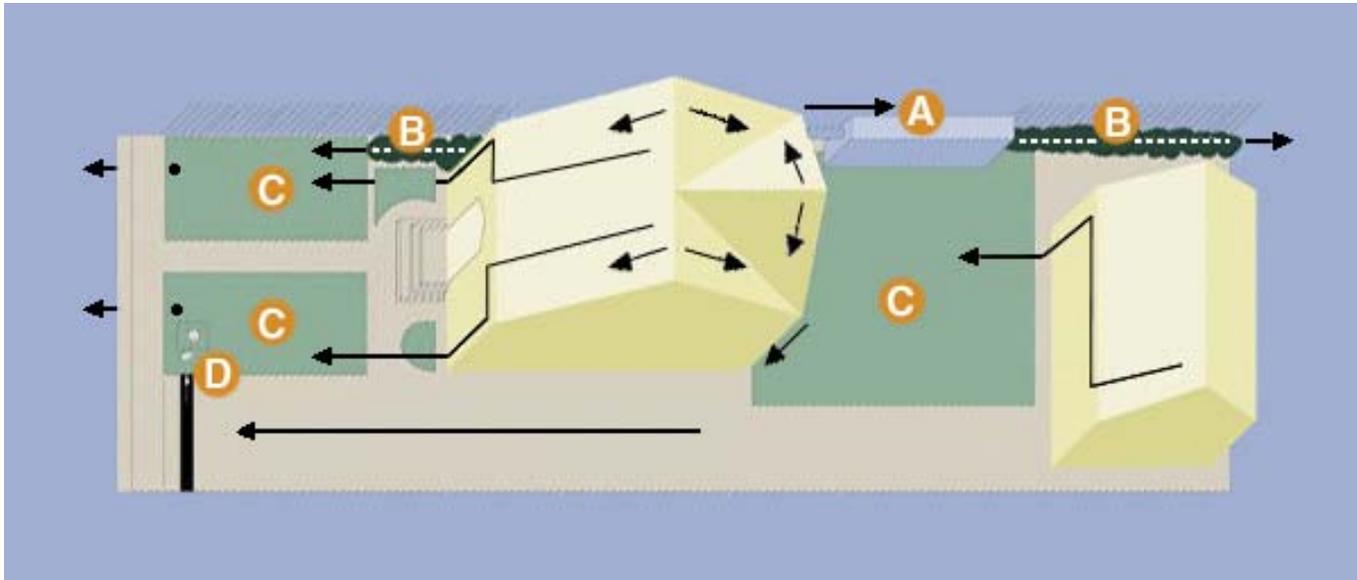
**STATE WATER BOARD AND THE WATER-ENERGY CLIMATE ACTION TEAM
CLIMATE CHANGE SCOPING PLAN IMPLEMENTATION WORKSHOP
MEASURE W-4: URBAN WATER REUSE**



Outline

- **Multi-Beneficial Projects in which TreePeople and/or LADWP are involved**
 - ▶ **Local Demonstration Projects**
 - ▶ **Regional Demonstration Projects**
 - ▶ **Large Centralized Projects**
- **The science to back it up:**
 - ▶ **Water Augmentation Study**
 - ▶ **Pilot Infiltration Test**
- **Lessons Learned**
- **Looking Beyond...**

Residential demonstration site



A Cistern

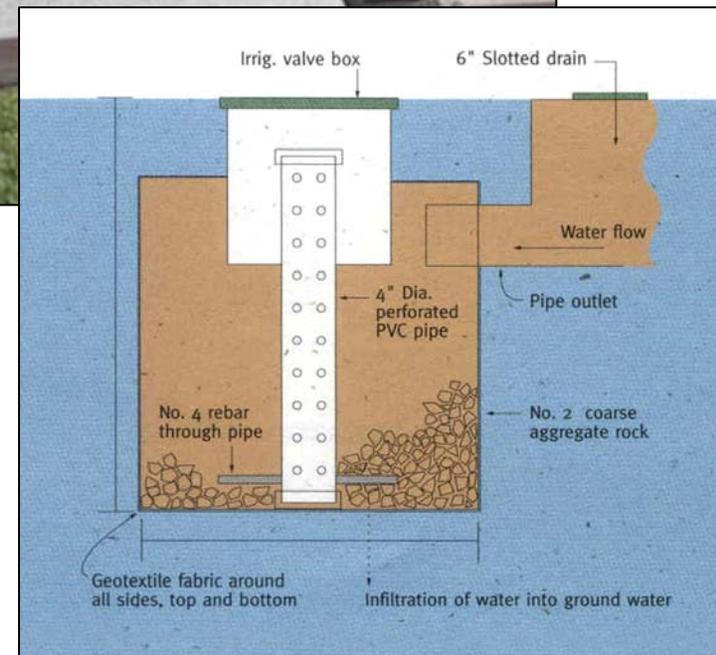
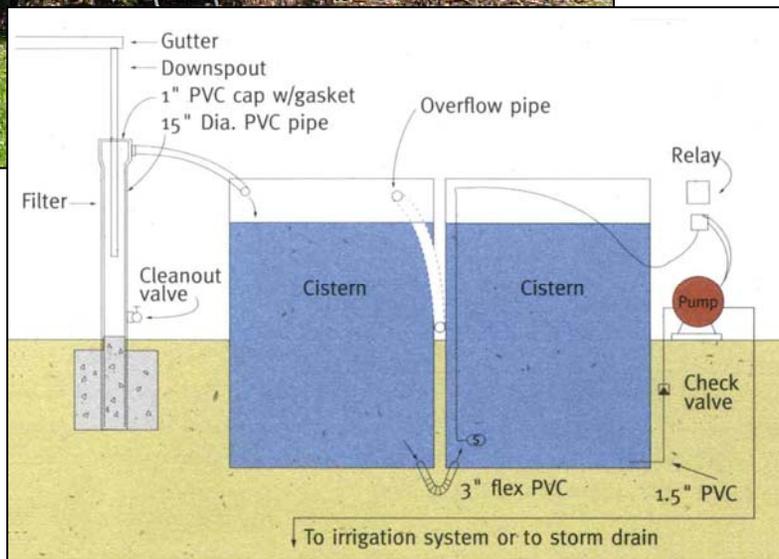
C Retention grading

B Mulched swales

D Driveway drywell

Residential demonstration site

Cisterns and Drywells



Rainwater storage for irrigation use with two tanks and a 3,600-gallon combined capacity

Residential demonstration site

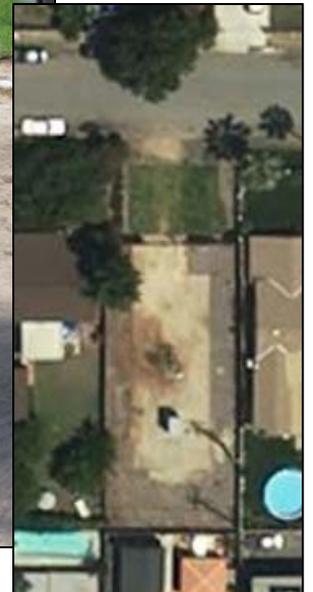
Lawns “bermed”



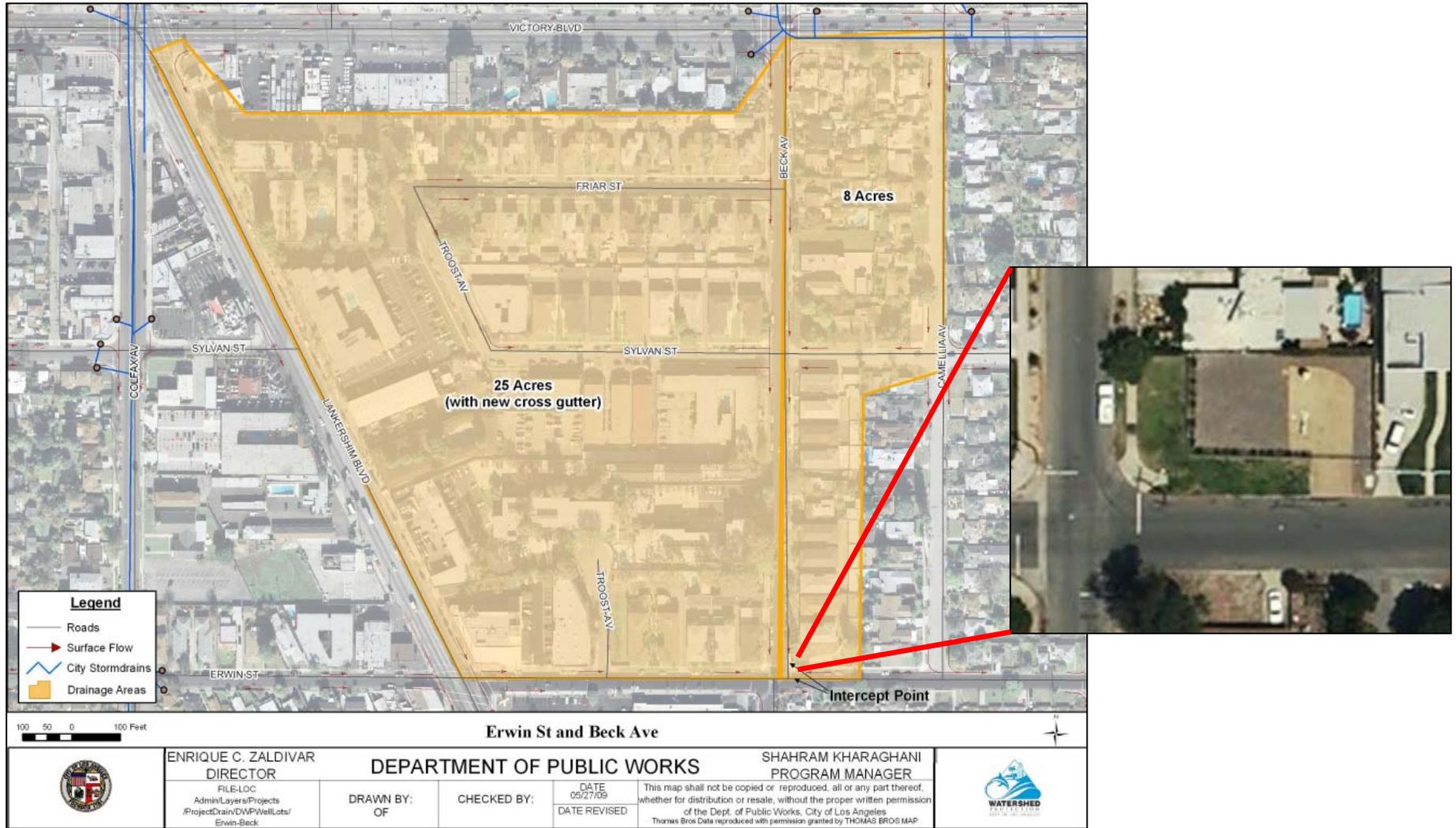
...and downspouts diverted



LADWP Well Lots



LADWP Well Lots



Broadous Elementary School

A Sustainable School project



Before:
lots of runoff, little recharge

Broadous Elementary School

**Runoff is captured, treated and infiltrated.
Stormwater...tapping a new source.**



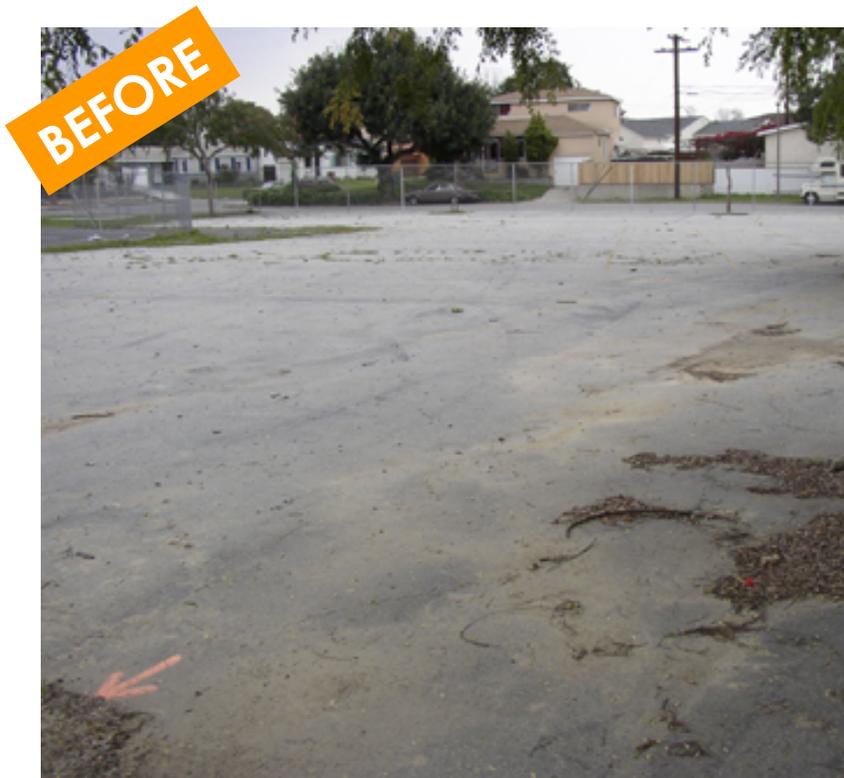
Broadous Elementary School

After:
lots of recharge,
less runoff



Open Charter Elementary School

Another Sustainable School project



Open Charter Elementary School



Outline

- **Multi-Beneficial Projects in which TreePeople and/or LADWP are involved**
 - ▶ **Local Demonstration Projects**
 - ▶ **Regional Demonstration Projects**
 - ▶ **Large Centralized Projects**
- **The science to back it up:**
 - ▶ **Water Augmentation Study**
 - ▶ **Pilot Infiltration Test**
- **Lessons Learned**
- **Looking Beyond...**

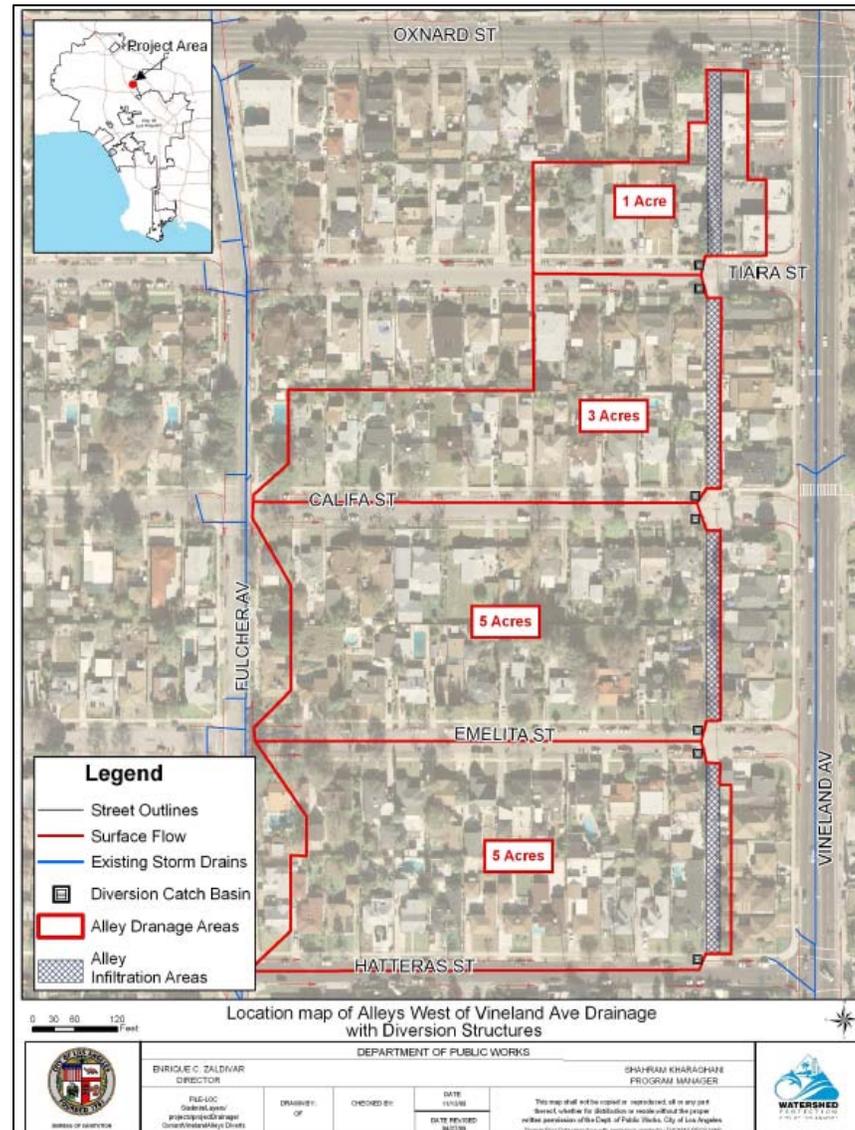
LADWP Power Line Easements



~ 100 acre-feet
per year within
the selected
segments



North Hollywood Alley Retrofits



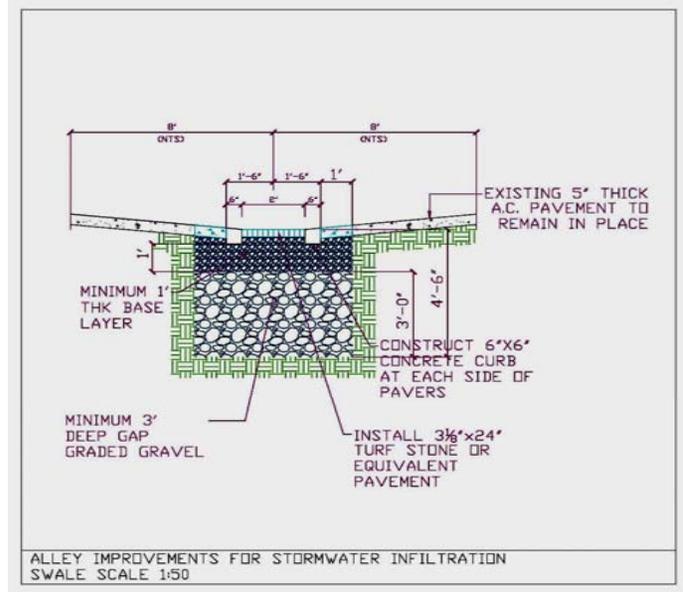
CITY OF LOS ANGELES
SANITATION
 DEPARTMENT OF PUBLIC WORKS



Alley Retrofits



~ 30 acre-feet per year within four alley segments



Woodman Ave. Median Retrofit



- Length of Median: 3,500 Feet
- Width of Median: 16 Feet



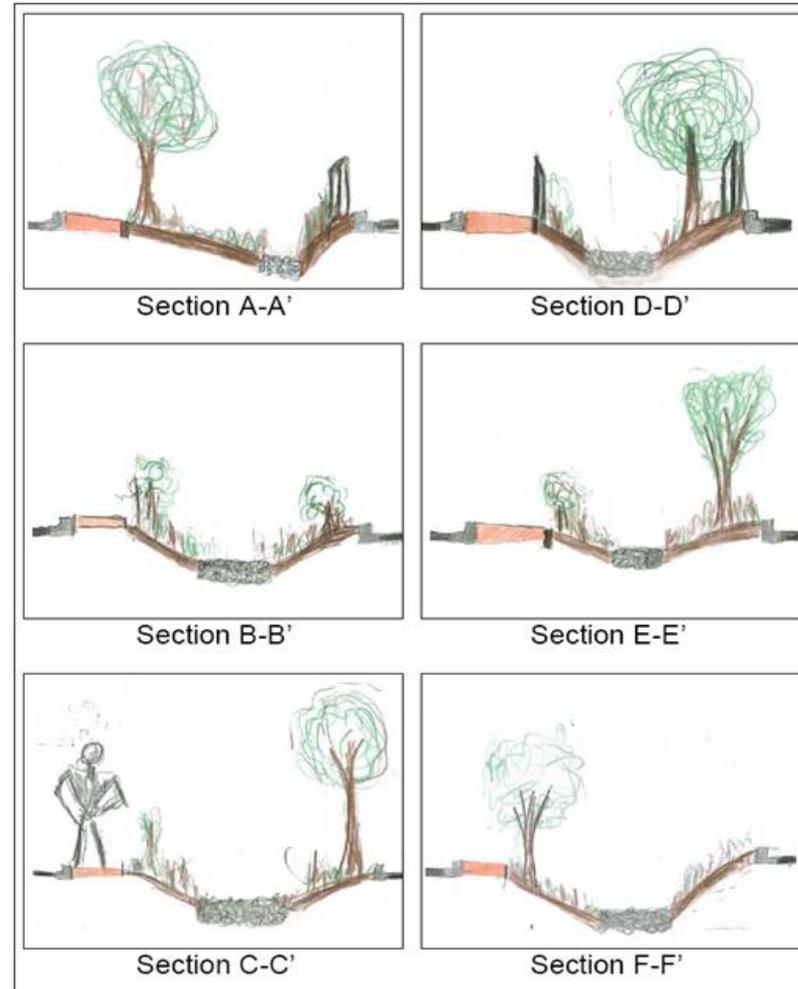
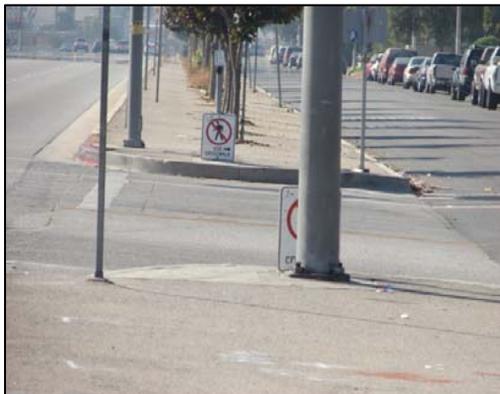
CITY OF LOS ANGELES
SANITATION
DEPARTMENT OF PUBLIC WORKS



Median Retrofit



Existing Concrete Median along Woodman Avenue (between Lanark Street and Saticoy Street)



~ 80 acre-feet per year within the median



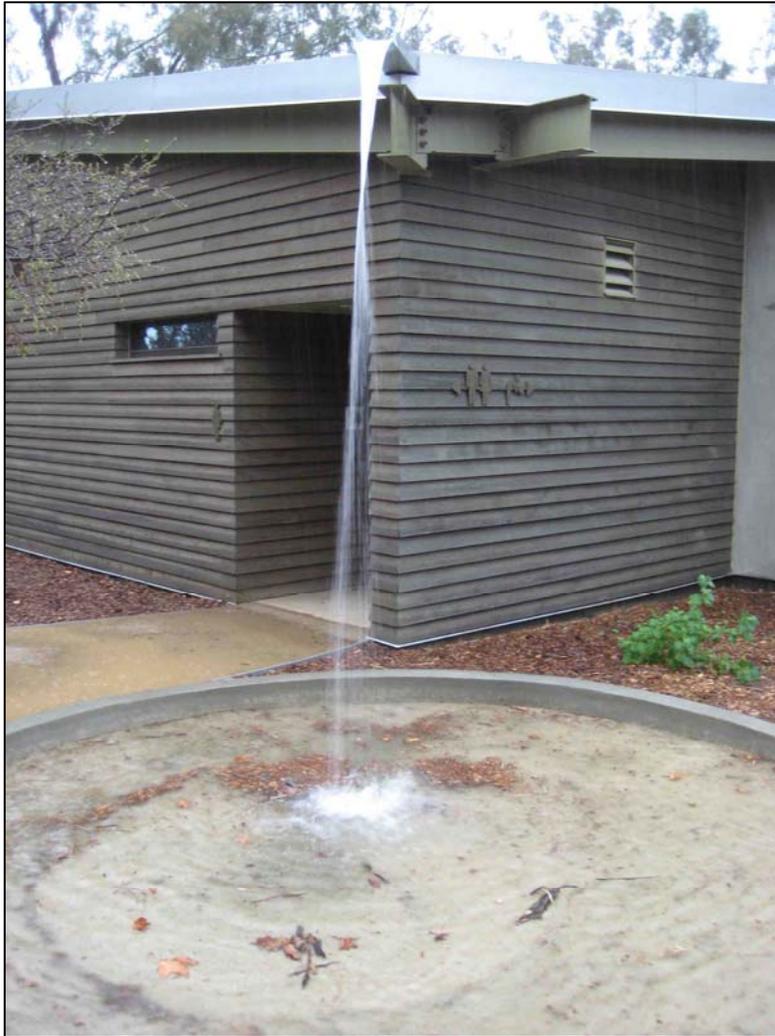
TreePeople Center for Community Forestry



TreePeople – Center of Community Forestry



TreePeople – Center of Community Forestry



A vision for Sun Valley...



Porous pavement

Industrial cisterns & drywells

Mulching

Retention basins/parks

Strategic tree planting

Residential cisterns & drywells

Infiltration/sports fields

Sun Valley Watershed Stakeholders Group



Stormwater Flow to Sun Valley Park



Sun Valley

Realizing the vision means...



Infiltration at Sun Valley Park



...and



Capture & use at Tuxford Green

Sun Valley

...but also BMPs



**Stormwater-capture BMPs
on
20 to 40%
of individual properties**

Sun Valley

...and Swales



Outline

- **Multi-Beneficial Projects in which TreePeople and/or LADWP are involved**
 - ▶ Local Demonstration Projects
 - ▶ Regional Demonstration Projects
 - ▶ Large Centralized Projects
- **The science to back it up:**
 - ▶ Water Augmentation Study
 - ▶ Pilot Infiltration Test
- **Lessons Learned**
- **Looking Beyond...**

Large-Scale Groundwater Recharge



Big Tujunga Dam

An increase of 4,500 acre-feet per year

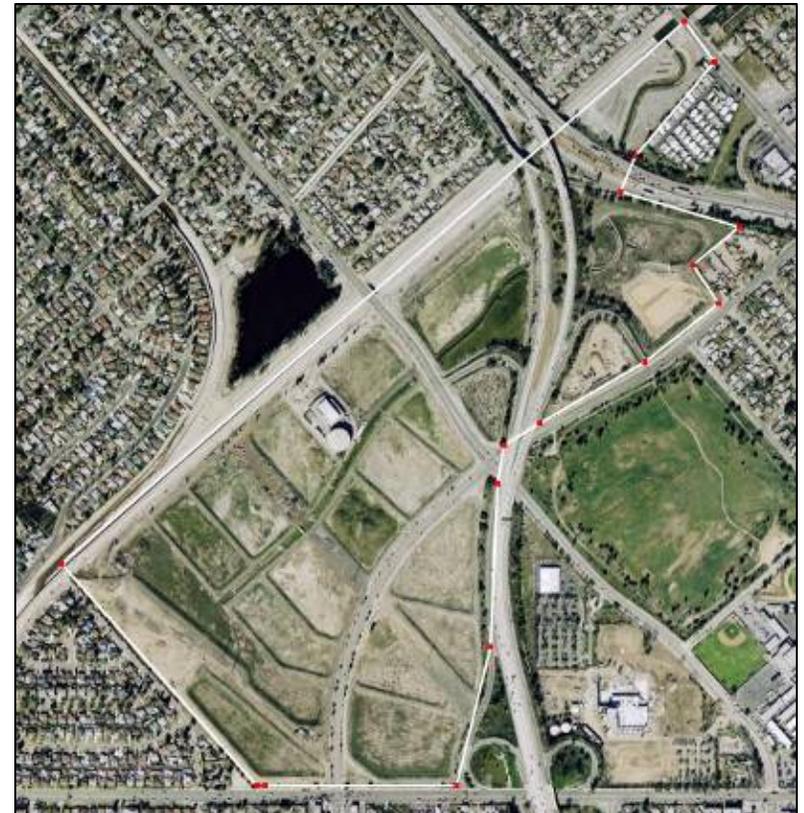


Large-scale groundwater recharge



Hansen Spreading Grounds Project

An increase of 1,500 acre-feet per year



Tujunga Spreading Grounds Project

An increase 8,000 acre-feet per year



Large-scale groundwater recharge

Pacoima Spreading Grounds Project An increase of 2,000 acre-feet/yr



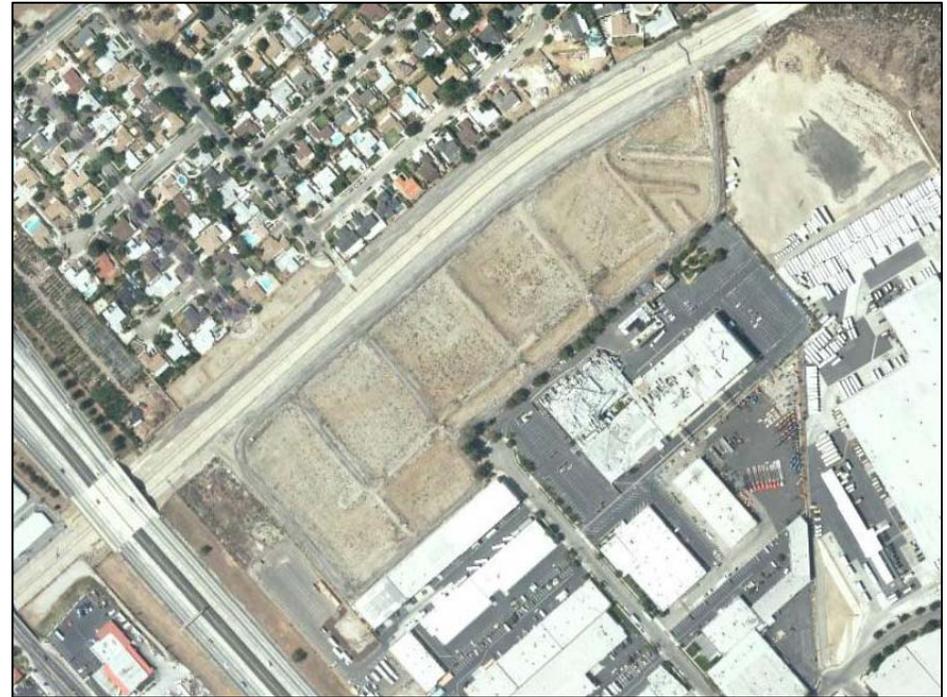
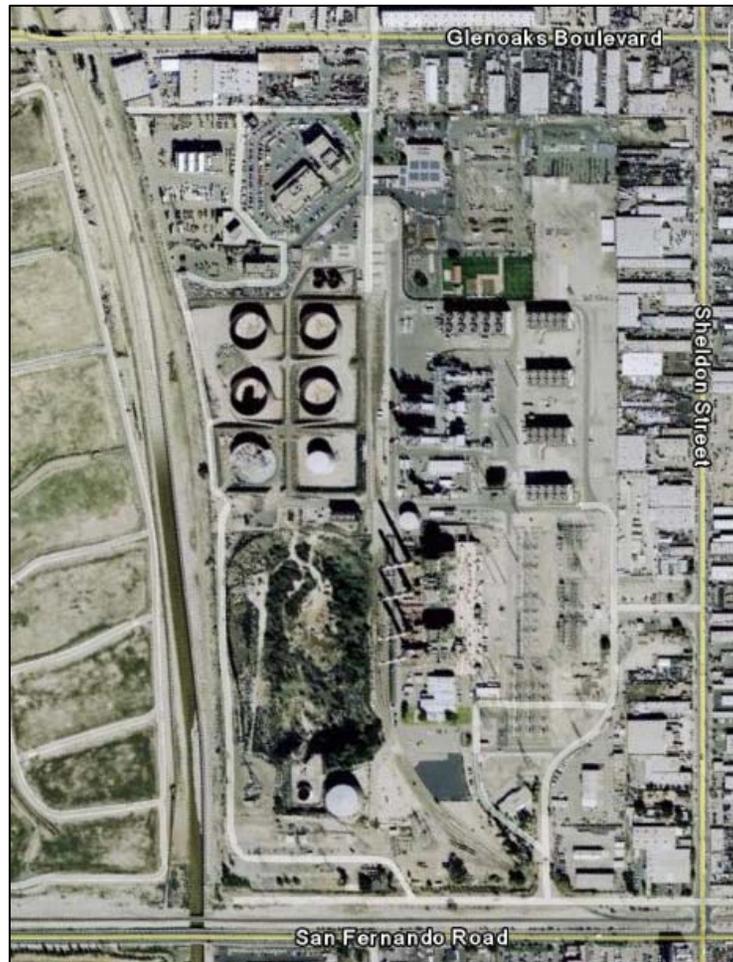
Sheldon-Arleta Project An increase of 4,000 acre-feet per year



Large-scale groundwater recharge

Valley Generating Station

An increase of 500 acre-feet per year



Lopez Spreading Grounds

An increase of 500 acre-feet per year

Outline

- Multi-Beneficial Projects in which TreePeople and/or LADWP are involved
 - ▶ Local Demonstration Projects
 - ▶ Regional Demonstration Projects
 - ▶ Large Centralized Projects
- The science to back it up:
 - ▶ Water Augmentation Study
 - ▶ Pilot Infiltration Test
- Lessons Learned
- Looking Beyond...

Water Augmentation Study

Research questions:

- Impact on groundwater quality and quantity
- Accessibility of recharged water
- Cost effectiveness
- Other potential benefits: social, economic, environmental
- Potential for region-wide implementation

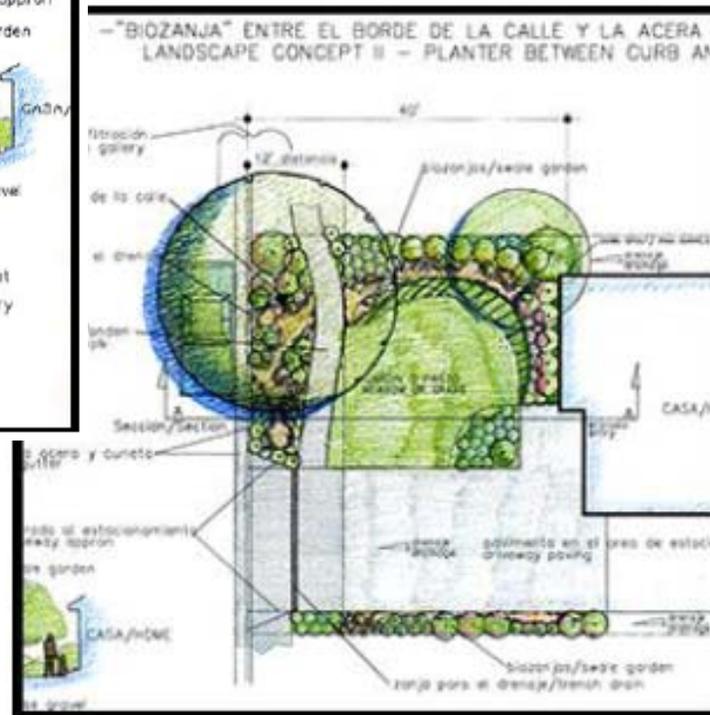
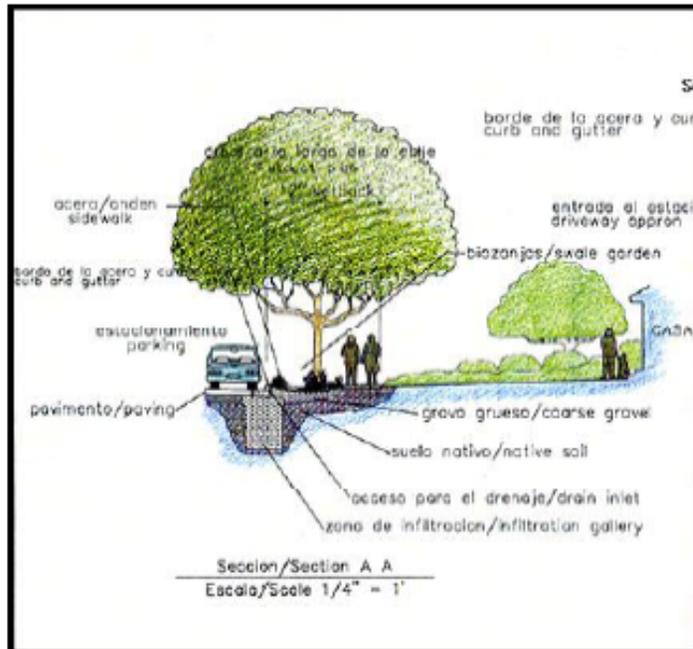
Monitoring Results: Eight Years of Data

Infiltration Did Not Negatively Impact Groundwater

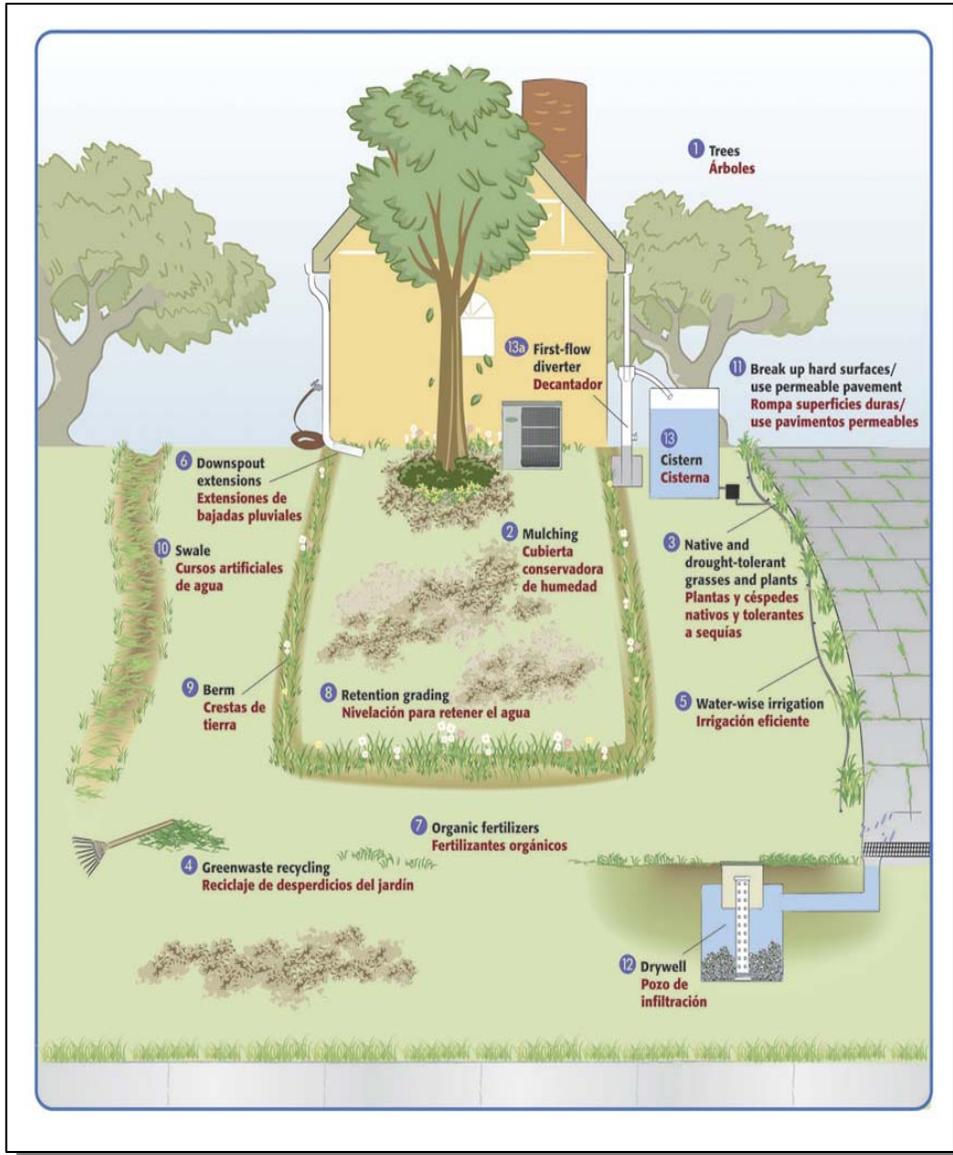
Concentrations in groundwater did not correspond to stormwater concentrations

- **Groundwater quality is stable or improved for most constituents at sites with shallow groundwater**
 - Bacteria: removed by soil
 - VOCs: no impacts detected in groundwater
 - Inorganic groundwater constituents show no or decreasing trends in concentrations

Elmer Avenue Retrofit



Water Augmentation Study/Elmer Avenue



Water Augmentation Study/Elmer Avenue

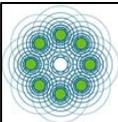
Project Partners



TREEPEOPLE



MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA



THE
LOS ANGELES & SAN GABRIEL RIVERS
WATERSHED COUNCIL



Los Angeles & San Gabriel Rivers Watershed Council
City of Los Angeles Department of Water & Power
City of Los Angeles Watershed Protection Division
City of Santa Monica Environmental Programs
County of Los Angeles Department of Public Works
California Department of Water Resources
Metropolitan Water District of Southern California
Regional Water Quality Control Board, LA Region
TreePeople
University of California, Riverside
U. S. Bureau of Reclamation
Water Replenishment District of Southern California



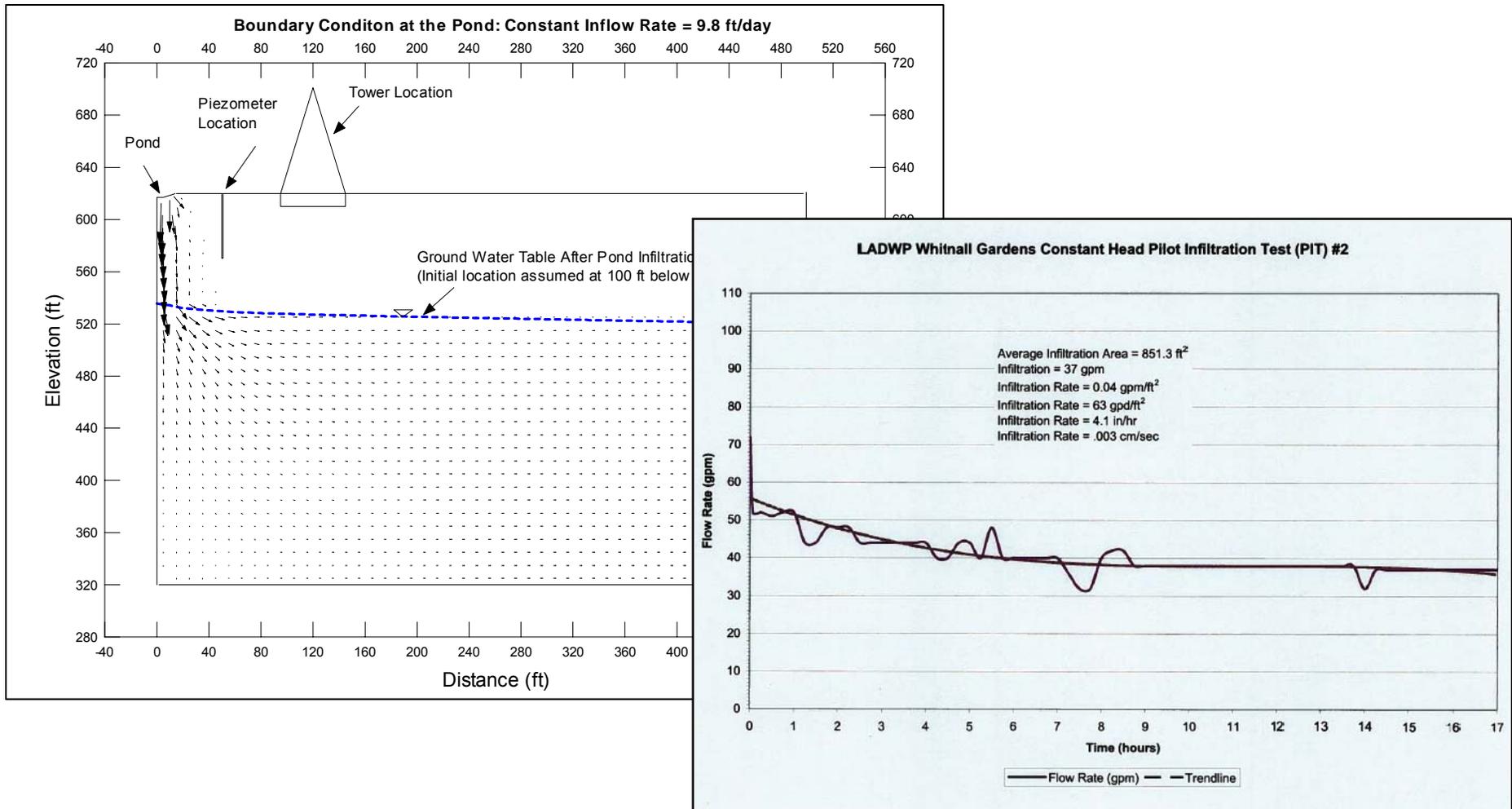
RECLAMATION
Managing Water in the West



City of
Santa Monica



Pilot Infiltration Test



Outline

- Multi-Beneficial Projects in which TreePeople and/or LADWP are involved
 - ▶ Local Demonstration Projects
 - ▶ Regional Demonstration Projects
 - ▶ Large Centralized Projects
- The science to back it up:
 - ▶ Water Augmentation Study
 - ▶ Pilot Infiltration Test
- **Lessons Learned**
- **Looking Beyond...**

Lessons Learned

- **Determine early on who will bear maintenance and other responsibilities that remain after construction is complete**
- **Extended timelines needed for partnership agreements**
- **Documentation and communication protocols to avoid loss of project and institutional memory during inevitable staff turnover**
- **Establish wide-ranging support at all relevant levels of staff at the partnering organizations - including maintenance staff**

Lessons Learned

- **Memorialize the project with onsite interpretation if possible**
- **Be sure that an accurate maintenance manual and protocols are documented and understood**
- **Baseline monitoring is important so results can be shared**
- **Involve appropriate regulatory agencies during design phase**

Outline

- Multi-Beneficial Projects in which TreePeople and/or LADWP are involved
 - ▶ Local Demonstration Projects
 - ▶ Regional Demonstration Projects
 - ▶ Large Centralized Projects
- The science to back it up:
 - ▶ Water Augmentation Study
 - ▶ Pilot Infiltration Test
- Lessons Learned
- **Looking Beyond...**

Looking beyond demonstration

- **A “PBMP” at the CUWCC**
- **Draft Guidelines for Cistern Water**
 - ARCSA and IAPMO
 - Who owns purple pipe?
- **Programs and incentives**
 - LADWP Turf Buy Back Program
 - City of LA Rainwater Harvesting pilot program
 - Green Streets Initiative
 - Retrofitting publicly owned land--LADWP undertaking
 - MWD-IRP – investigating stormwater incentives
- **Examples Leading the way**
 - Texas and Arizona
 - City of Santa Monica
 - San Francisco Public Utilities

For More Information...

www.treepeople.org

&

www.LADWP.com

